A Study on the Listing Choices of Chinese Companies

by

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Abstract

A Study on the Listing Choices of Chinese Companies statistically analyzes and empirically explains any pattern that may be present among the past listing choices (China, Hong Kong, and US) of Chinese IPOs in hope that, with this study, people can better understand the listing choices of past Chinese IPOs and, consequently, use this understanding as guidance for the listing choice of future ones. The study first compares the stock exchanges in the three destinations, specifically in terms of their listing processes and standards. Next, to uncover any pattern among the past listing choices of Chinese companies, the study uses a nominal logistic model to perform regression on data from 750 Chinese IPOs between 2004 and 2015; IPO destination of each IPO is regressed against 11 predictor variables such as industry classification and net income at issue. The regression results reveal five clear patterns for the listing choices of Chinese companies, which are as follow:

1. Chinese TMT companies prefer US IPOs
2. Chinese industrial companies prefer China IPOs
3. Valuation differences across destinations have limited impact on listing choice
4. Chinese companies with positive net income at issue prefer China IPOs
5. IPO offering size has limited impact on listing choices

The study then provides explanations to each of the five findings.

Acknowledgements

I dedicate this honors thesis to my family, especially my mother, Fengyan Liu, and my father, Wei Shen. I credit my success thus far to your unconditional love and constant support – you have always been my guiding light in life that led me to come from a small town in China and become who I am today, and I am forever in gratitude for that.

My special thanks to my thesis adviser Professor Robert Whitelaw for guiding me throughout the making of this thesis. The immensity of your knowledge and passion for the Chinese financial market inspires me to keep studying it to understand and appreciate its unique intricacies.

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Table of Content

Part 1: Introduction

Understanding Chinese companies' listing choices became an intriguing topic of the financial world in 2013 when Alibaba took months to publicly debate with the president of Hong Kong Stock Exchange regarding whether it should bring its record-breaking US$ 25 billion initial public offering (IPO) to Hong Kong or the US. In a series of high-profile blog posts made by Alibaba's then chief financial officer Joseph Tsai, the public had a glimpse into the complexities that a Chinese company like Alibaba faces when it chooses its IPO destination. Indeed, choosing where to go public is an elaborate decision especially for Chinese companies as they are often presented with three different options – China, Hong Kong, and the US. The stock exchanges in these three destinations are very different in their own rights and their different unique features appeal to different sets of Chinese companies.

Because of the complexities of this decision-making process, companies sometimes make mistakes. For example, Momo Technology – a Chinese social media company – listed on Nasdaq in December 2014 and only found itself to willingly delist from Nasdaq and relist in China 10 months after its US IPO[1]. Such a mistake is costly; fees for delisting and relisting could mount to millions of dollars. The past mistakes in listing choices make it important for Chinese companies to fully understand their options and the reasoning behind choosing a particular IPO destination.

In this thesis, I set out to statistically analyze and empirically explain any pattern that may be present among the past listing choices of Chinese IPOs in hope that people can better understand the listing choices of past Chinese IPOs and, consequently, use this understanding as guidance for the listing choice of future ones. The content of this thesis is organized as follows. We first compare the stock exchanges in the three destinations in Part 2. Part 3 describes the data

[1] Goodbye New York! Hello Shanghai!, Major Tian, CKGSB Knowledge, June 24 2015

that I have collected for statistically analyses. I also describe the statistical methodologies used in this study in Part 4, followed by revealing my findings in Part 5. Part 6 provides explanations to my findings, and finally Part 7 offers a few concluding remarks.

Part 2: Overview and Comparison of Shanghai Stock Exchange, Hong Kong Stock Exchange, Nasdaq, and New York Stock Exchange

To understand the choice of a particular IPO destination for a Chinese company, we first need to understand the available options that it faces and the differences between these options. In this study, we focus on the Shanghai Stock Exchange (SSE) as our choice for a mainland IPO, the Nasdaq and New York Stock Exchange (NYSE) as choices for an US IPO, and the Hong Kong Stock Exchange (HKEx) for a Hong Kong IPO; the four exchanges are chosen as the focus of this paper because they are by far the most popular destinations for Chinese IPOs.

Both domestically and internationally, there are, however, other exchanges where Chinese companies have gone for IPOs. Shenzhen Stock Exchange is another mainland market, but because it primarily serves small-to-medium enterprises with market capitalizations under US$ 200 million, it is not included in this study. Historically Chinese companies have also listed overseas in Singapore, UK, and other exchanges, but these are very rare cases and, thus, are left out of this study as well.

Overview of the Four Exchanges

Below is a table summarizing some vital statistics of the four exchanges:

Table 1: Overview of SSE, HKEx, Nasdaq, and NYSE

	SSE	HKEx	Nasdaq	NYSE
Year Founded	1990	1891	1971	1792
Market Cap	4,549,288	3,184,874	7,280,752	17,786,787
# Listed Companies	1,081	1,866	2,859	2,424
Value of Share Turnover[1]	1,118,435	104,011	1,031,449	1,486,084
Parent Company	China Securities Regulatory Commission	Hong Kong Exchanges and Clearing Limited	The NASDAQ OMX Group	Intercontinental Exchange

As of Dec 31, 2015; in USD millions, except # Listed Companies; incl. SME markets; excl. funds
[1]by electronic order book, in December 2015
Source: World Federation of Exchanges

Nasdaq and NYSE are the more established exchanges among the pack by almost every metric. Consequently, they offer the most prestige and enjoy the most diverse group of investors; for these reasons, they are popular exchanges for IPO candidates all over the world. For example, in 2014, NYSE successfully won the Alibaba listing over HKEx to have the world's largest IPO under its belt.

HKEx, on the other hand, owns the next three world's top IPOs by offer size, and rather not by coincidence, these three deals are all from Chinese companies. Despite having the smallest market cap and share turnover, it is a popular overseas IPO destination among Chinese companies with around 50% of all the listed companies on HKEx being mainland China companies[2]. They love HKEx because the cultural and geographic affinities between Hong Kong and mainland China make investors in HKEx appreciate Chinese companies' value and make their communication with the exchange and investors easy.

Among the four exchanges, SSE is by far the newest. With merely 26 years of existence compared to NYSE's hundreds years of history, SSE is still cautiously experimenting with its

[2] HKEx Website

operations, and sometimes its precautious measures could prove to be limiting for the listed companies. Unlike the other three, SSE, for example, still has a ten percentage daily movement limit for all listed companies, which means trading for a particular stock will suspend for the day once this stock hits ten percent gain or loss. Additionally, investor also cannot buy a stock and sell the same stock on the same day, limiting trading liquidity. In the beginning of 2016, SSE also temporarily experimented with circuit breakers that left many investors perplexed. This mechanism is tied to the benchmark CSI300 Index, which tracks the largest listed companies in SSE and Shenzhen Stock Exchange, where a seven percent rise or fall in the CSI300 Index will prompt a trading halt in the Shanghai and Shenzhen stock exchanges for the rest of the day[3]. Nevertheless, investors hated the circuit breaker rule and it was suspended indefinitely after a few weeks of its implementation. These market interventions stem from the Chinese government's tight control over the stock market. While the other three exchanges are subsidiaries of publicly traded, non-state-owned companies, SSE is a state-owned, non-profit organization administered by the China Securities Regulatory Commission (CSRC), the securities regulator in China. CSRC's immense power over SSE becomes even more apparent when we look at its IPO application process.

Differences Among Four Exchanges' IPO Processes

Below is a table summarizing the key differences among the four exchange's IPO processes:

[3] China's latest step to curb stocks' wild ride: Circuit breakers, See Kit Tang, CNBC, 4 Jan 2016

Table 2: Key Differences Among Four Exchange's IPO Processes

	SSE	HKEx	Nasdaq	NYSE
Application Method	By Sponsorship and CSRC Approval	By Sponsorship	Company Disclosure	Company Disclosure
Average Process Time	10 Months	6 Months	4 Months	4 Months
Foregin Legal Counsels Involved	None	HK; CI/BVI/Bermuda (optional)	US; HK/CI/BVI/ Bermuda	US; HK/CI/BVI/ Bermuda
Overall Fees	Low	Medium	High	High

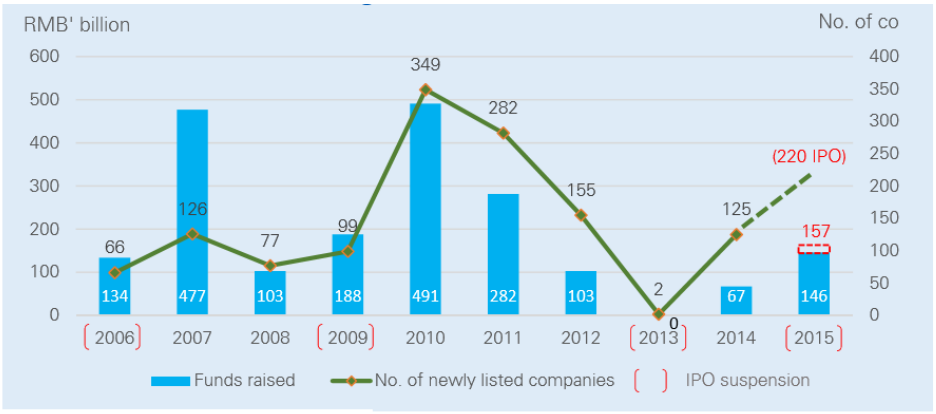
CI=Cayman; BVI=British Virgin Island

The advantage of SSE's IPO process is that it is the cheapest. The listing companies does not need to use additional foreign legal counsels or set up numerous offshore holding companies. Nor does it need to hire costly international investment banks. SSE also only charges a meager US$100,000 for a US$125 million-or-above issuance. (See Appendix A for fee chart)

Nonetheless, the biggest drawback of a SSE IPO is its unpredictable processing time, which, on average, is months longer than the other three exchanges. The long wait time is a result of mainland markets' unique application method. For each IPO application, SSE requires a combination of underwriter sponsorship and CSRC approval to ensure the legitimacy of the listing candidates and the accuracy of their information disclosure. Historically, fraud is a concern for Chinese companies' IPOs. Under this mechanism, a listing candidate needs to have a sponsor who usually is a certified investment bank to guarantee the integrity of the candidate. Furthermore, while it is customary for all exchanges to review and approve each listing, mainland China IPOs require additional approval from the Chinese securities regulator – CSRC. Hence, SSE's approval process is different from those of the other three exchanges as it is the only one that mandates governmental review and approval in addition to each exchange's own review processes.

While this application process largely eliminates fraud in IPOs, it also gives CSRC immense power in controlling mainland IPO activities as it controls when to issue the required approval for listing. By prolonging the approval time indefinitely, CSRC can effectively shut down IPO activities in mainland. Chart 1 shows the number of all IPOs in mainland from 2006 to 2015 where IPO suspensions happened in 2006, 2009, 2013, and 2015.

Chart 1: Number of IPOs in Mainland China between 2006 and 2015



Source: Wind Info and KPMG analysis

Because SSE has a large retail investor base, CSRC, as a government agency, often feels the responsibility to protect them from high market volatility. Therefore, it tends to implement IPO halts when the market is over-heating or plummeting to preserve market liquidity for retail investors' positions in existing listed companies. The resulting unpredictability in IPO wait time makes SSE an unattractive destination for IPO candidates who are thirsting for capital.

Similar to SSE, HKEx also requires sponsorship from an investment bank for each IPO candidate. Nonetheless, because it is run independently from the Hong Kong government, there is no need to obtain listing approval from the government and, hence, its process time is faster. HKEx's process, however, is a little costlier than SSE's process. While HKEx does charge listing fees at a few basis points higher than SSE (see Appendix A for fee chart), the increase in

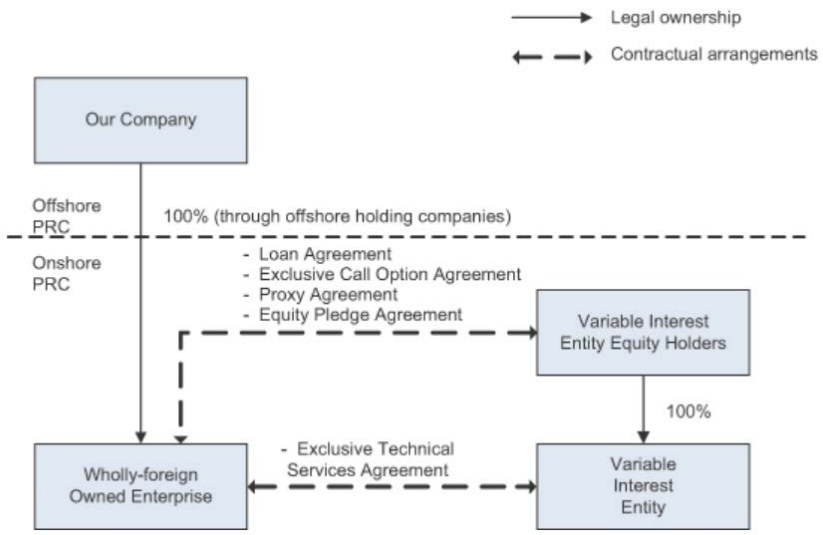
costs mainly stems from legal complexities. In addition to legal counsel in mainland, companies also need to retain legal representation in Hong Kong to ensure compliance with local laws, effectively doubling the legal fees.

In most cases, Chinese companies pursuing IPOs in Hong Kong also pay international law firms additional fees to set up offshore holding companies. We know from earlier that any mainland China company filing for an IPO needs to obtain the approval from CSRC. This rule also applies to any mainland China domicile company that is going public abroad. Setting up and listing an offshore entity instead of the one in mainland can circumvent this rule and greatly expedite the IPO process. In fact, 77% of the Chinese companies listed on HKEx are technically companies registered in Hong Kong, Cayman Island, British Virgin Island, or Bermuda whose Chinese subsidiaries generate most of the income.[4]

Among these overseas holding companies, there is an especially complex type that involves the use of variable interest entities, or VIEs. They were created to bypass certain Chinese regulations governing foreign direct investment (FDI) in the past.[5] Before the drafting of the new FDI laws in January 2015, the Chinese Ministry of Commerce prohibited FDI in certain sensitive industries like Internet, telecommunications and media in the mainland. By setting up VIEs, the overseas holding companies will contractually control their profit-generating mainland entities without actually owning any equity stake in them. Graph 1 shows the typical corporate structure involving VIEs:

[4] Listing PRC companies in Hong Kong using VIE structures, Charltons
[5] Hong Kong IPO Market Update, KPMG, July 2015

Graph 1: An Example of a Corporate Structure Involving VIEs[6]



While the onshore mainland China (PRC) VIE is the entity that is conducting all the economic operations and generating profits in China, the company being listed is an offshore holding company that owns an onshore PRC shell company that receives all the profits that the VIE produces through a services agreement. The listing company also maintains control of the VIE since the onshore shell subsidiary has a proxy agreement with the equity holders of the VIE. Now, through the VIE structure, foreign investors can invest freely in the listing company as it technically does not own the onshore VIE, thus bypassing the laws in China. Given the legal complexities in setting up the offshore holding structure, the listing companies pay a significant more amount in legal fees in an overseas IPO than in a domestic one.

On the other hand, getting listed in the US is even more expensive. Chinese companies not only spend the same legal fees in setting up these offshore entities, but also need to retain additional US legal counsel, international investment banks, and international public relations teams, all of which often charge around 100 basis points higher than their Hong Kong

[6] Form F-1, Alibaba Group Holding Limited, May 6, 2014

counterparts. Meanwhile, Nasdaq and NYSE also charge heftier listing fees. (See Appendix A for fee chart) The benefit of the US process, however, is that it is the fastest because it only requires voluntary disclosures in a registration-based application process that leaves out much of the bureaucracy that companies may find in mainland and in Hong Kong.

Differences Among the Four Exchanges' Listing Standards

Table 3 below summarizes the key differences among the four exchanges' listing standards. (See Appendix B for complete financial listing requirements for all four exchanges)

Table 3: Key Differences Among the Four Exchange's Listing Standards

	SSE	HKEx	Nasdaq	NYSE
Allow Negative Income	No	Yes, but difficult	Yes	Yes, but difficult
3-Year Track Record Period	Yes	Yes	No	Yes
Allow Share Structure w/ Weighted Voting Rights	No	No	Yes	Yes

Out of the four exchanges, SSE has the most stringent IPO requirements. It not only looks for a three-year financial track record but also has set specific thresholds in terms of revenue and profitability for a listing company to achieve in these three years. Among the requirements, it mandates, for example, positive net profits for the last three fiscal years, cumulative net profits for the last three fiscal years that exceed RMB 30 million (US$ 4.6 million), and cumulative business revenues for the last three fiscal years that exceed RMB 300 million (US$ 46 million). Although many companies may exceed the required revenue threshold,

the required three consecutive years of positive net profits can be a deal-breaker for many growth-oriented companies such as Internet companies. Therefore, one major reason for some of the Chinese companies to seek overseas listings is that they do not have three consecutive years of positive net profits, which most foreign exchanges do not require.

Nasdaq is the most tolerant among the four. While HKEx, NYSE, and Nasdaq all allow listings of companies with net loss at issue, Nasdaq's requirements are a lot less demanding as they do not have additional revenue requirement like HKEx and NYSE do. Furthermore, Nasdaq does not require proof for three years of continuous operations. This difference is important because, as explained earlier, a Chinese company often sets up a new offshore holding company for the purpose of an overseas IPO, and the newly set up offshore company does not have a three-year track record. Although this problem can be addressed by purchasing an existing overseas company that has been in existence for more than three years, HKEx also requires the listing company to have the same controlling shareholder in the year prior to IPO filing. In other words, the listing company has to wait for a year after the purchase before going public in Hong Kong. Hence, going public on Nasdaq is the fastest and the easiest.

Another major distinction among the four exchanges is the difference among their respective attitudes toward dual-share class structure, which is a share structure with weighted voting rights. Under this share structure, one class of shares will have more voting rights than another, and by only issuing the shares with less voting rights, founders of a company can remain control of the company more easily after a public offering. This is a widely accepted practice in the US with Google being the most well-known case for using a dual-share structure; however, HKEx and SSE both reject such a share structure due to corporate governance concern. This was the main reason that prompted Alibaba to choose NYSE over HKEx for its IPO.

Part 3: Description of the Data Used in This Study

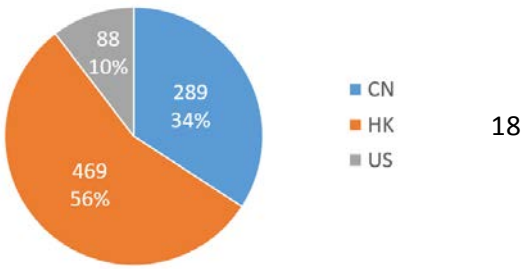
Describing the IPO Data

The data include 846 Chinese companies' IPOs in China (CN), Hong Kong (HK), and US that happened between January 1st, 2004 and December 31st, 2015. Capital IQ (Cap IQ) was the source for all the IPO data collected.

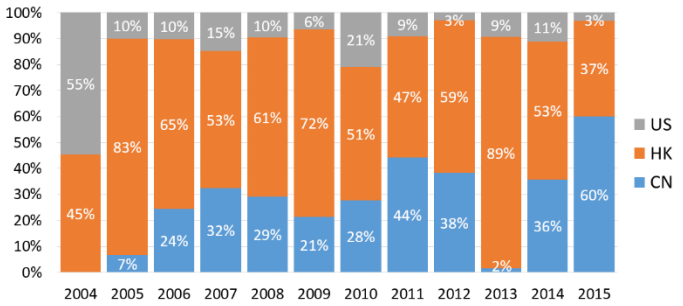
While this number captures most of the Chinese companies' IPOs that happened in these three countries from 2004 to 2015, it does not include all of them for a few reasons. First, only IPOs in select exchanges were considered for each country – SSE's Main Board for CN; HKEx's Main Board and Growth Enterprise Market (GEM) for HK; Nasdaq Global Select Market, Nasdaq Global Market, Nasdaq Capital Market, and NYSE's Main Board and ARCA for US. A major chunk of Chinese companies' IPOs that this dataset leaves out is IPOs on Shenzhen Stock Exchange in China for the reason explained in the beginning of Part 2. Next, it also excludes all backdoor listings, where a Chinese company goes public by purchasing an existing listed company on an exchange. These backdoor listings are irrelevant to this study because new share issuances for backdoor listings often occur separately from the listing (purchase) dates. Finally, there were also IPO cases that were left out because data for these IPOs looked questionable.

Meanwhile, the 2004 to 2015 time period was chosen because data for IPOs in CN or HK seemed unreliable before 2004 and also because data for first quarter of 2016 were not fully updated. Chart 2 and 3 below show the number of Chinese companies' IPOs by destination between 2004 and 2015 and its trend during the period:

Chart 2 and 3: Number of Chinese Companies' IPOs by Destination between 2004 and 2015 and Its Trend during the Period



The two graphs show that in the set of IPOs that we are examining, HK has consistently been the most popular IPO destination for Chinese companies.



Meanwhile, CN in recent years have been chipping away IPO market share from HK and US and increasingly fewer companies are interested in US listings.

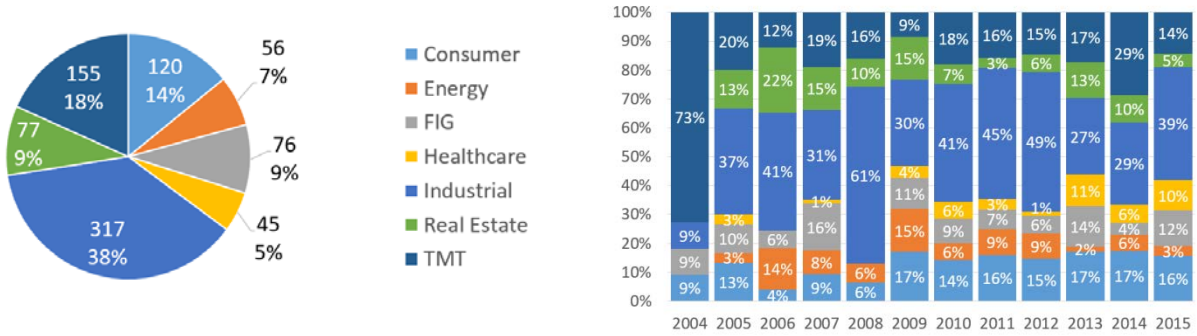
Cap IQ records a wide range of information associated with each IPO. This provides great flexibility for the study. I selected a few of the most vital data points for each IPO to study while keeping the rest of the data points for additional analyses when fit. The vital data points I chose include IPO destination, primary industry classification, offer date, net income at issue, and gross proceeds raised at issue. IPO destination is the focus of this study and I reckon the other vital data points can be useful predictors of IPO destination.

First, industry classification is important information as sometimes companies in the same industry cluster in a particular exchange. For example, Nasdaq is famous for being a tech-heavy exchange; technology companies comprise of 22% of all companies listed in Nasdaq.[7] Cap IQ reports companies' primary industry classifications, which are in excess of 20 groups. For the ease of the study, I further categorized the companies into seven industry groups based on the group each company will fall under within an investment bank. The seven groups are Consumer & Retail, Energy, Financial Institution (FIG), Healthcare, Industrial, Real Estate & Hospitality, and Technology, Media, and Telecom (TMT). This categorization is useful because it recreates the IPO situation where a specific group within an investment bank is assigned to

[7] List of Technology Companies, Nasdaq Website

assist a company's IPO. Chart 4 and 5 below show the number of Chinese companies' IPOs by industry between 2004 and 2015 and its trend during the period:

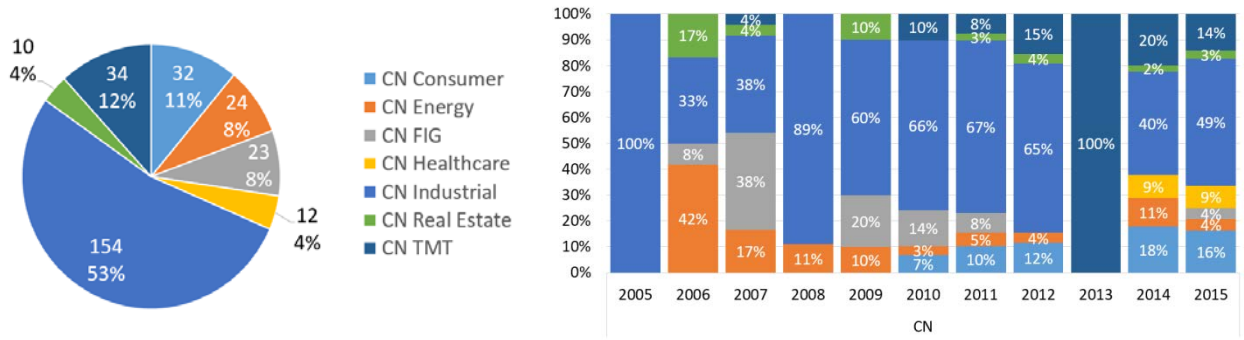
Chart 4 and 5: Number of Chinese Companies' IPOs by Industry between 2004 and 2015 and Its Trend during the Period



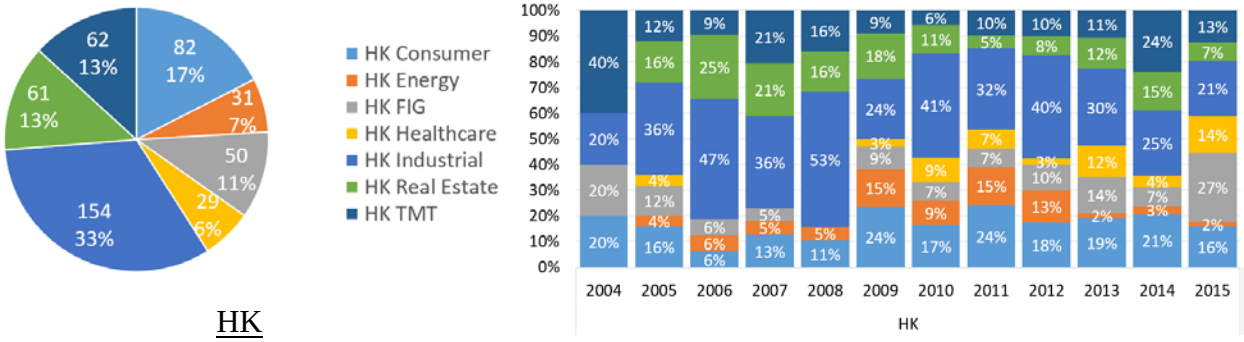
The data has shown that historically industrial companies have consistently accounted for the biggest chuck of the Chinese IPO deals. This is perhaps because industrial sector had been the focus of the Chinese economy until its recent transition into a consumption-led model; industrial sector, as a result, simply has the most ready-to-IPO companies among all sectors. On the other hand, the transition into a consumption-led economy is encouraging the rise of Chinese healthcare and consumer companies and is probably the reason why the number of IPOs in these two sectors has been on the rise in recent years.

I also broke down the number of Chinese companies' IPOs by industry in each of the three destinations, as shown in Chart 6, 7, and 8 below:

Chart 6, 7, and 8: Number of Chinese Companies' IPOs by Industry in CN, HK, and US Respectively between 2004 and 2015 and Their Respective Trends

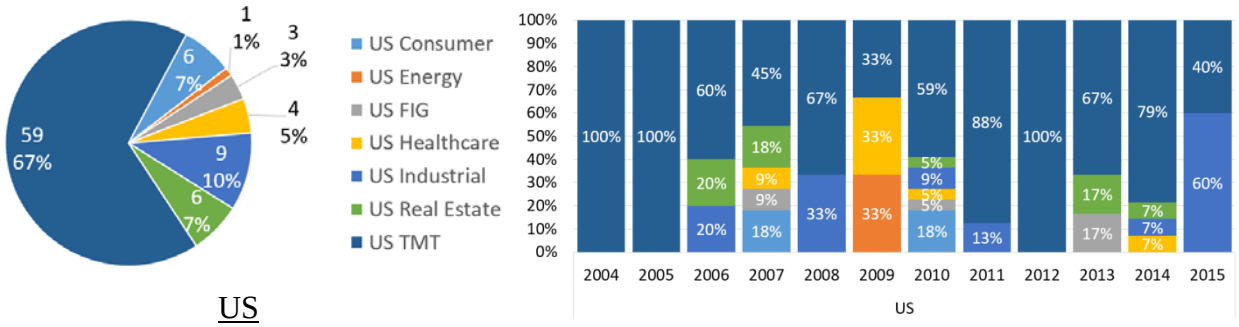


CN[8]



HK

[8] Data was not reliable for IPOs in CN in 2004

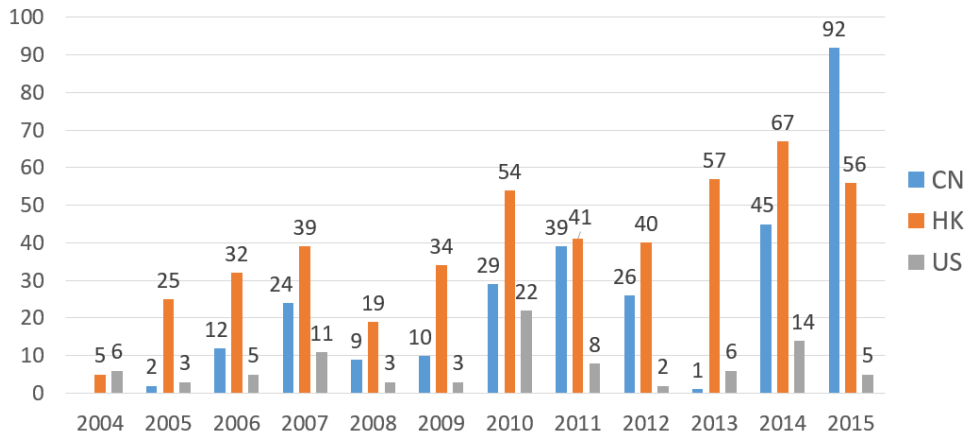


US

Compairing the three destinations, we can observe that each destination has attracted a different mix of industires in the past. Industrial companies dominated the IPO activities in CN while TMT companies dominated the Chinese IPO acitivities in the US. Meanwhile, Hong Kong attracted a diverse set of Chinese companies with industrial and consumer companies being the top two sectors by number of IPOs.

Next, offer date is important because it can be used to find the Price/Earnings ratio at offer and also because, it helps us to recognize whether a particular IPO happened during one of SSE's IPO freezes mentioned in Part 2. The chart below breaks down the number of Chinese companies' IPOs by destination and by year between 2004 and 2015:

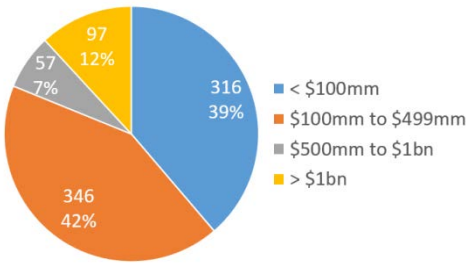
Chart 9: Number of Chinese Companies' IPOs by Destination and Year between 2004 and 2015

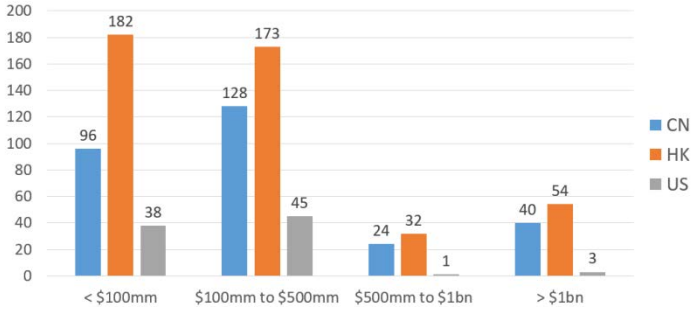


The data shows that increasingly more Chinese companies have been trying to go public, and increasingly more of them are choosing HK and CN as their IPO destinations.

Gross proceeds raised is an important predictor of the IPO destination because different exchanges have different levels of market liquidities and, thus, different capacities in dealing with mega-size deals. It is important also because the amount of gross proceeds raised also influences a listing company willingness to take additional fees. Chart 10 and 11below show the number of Chinese companies' IPOs by gross proceeds raised between 2004 and 2015 and its breakdown by three destinations:

Chart 10 and 11: Number of Chinese Companies' IPOs by Gross Proceeds Raised between 2004 and 2015 and Its Breakdown by Three Destinations

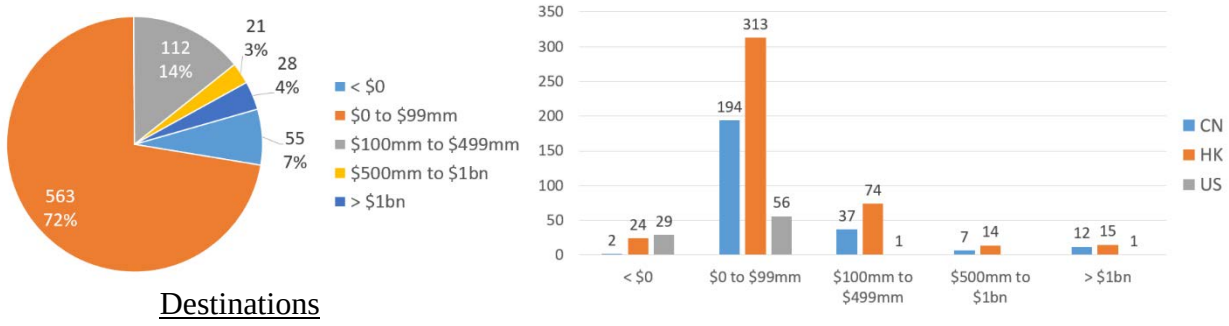




The graphs show that most of the Chinese IPO offering sizes are under US$ 500 million. Also, most of the large size deals that are above US$ 500 million offering size tend to stay away from the US. This is probably because most of these companies are large state-owned enterprises that do not wish to be probed by the US government or owned by US investors.

Finally, net income at issue is an important predictor because different exchanges have different requirements for a listing company's net income level, especially toward whether a listing company can have net loss at issue or not, as mentioned in Part 2. Chart 12 and 13 below show the number of Chinese companies' IPOs by net income at issue between 2004 and 2015 and its breakdown by three destinations:

Chart 12 and 13: Number of Chinese Companies' IPOs by Net Income at Issue between 2004 and 2015 and Its Breakdown by Three Destinations

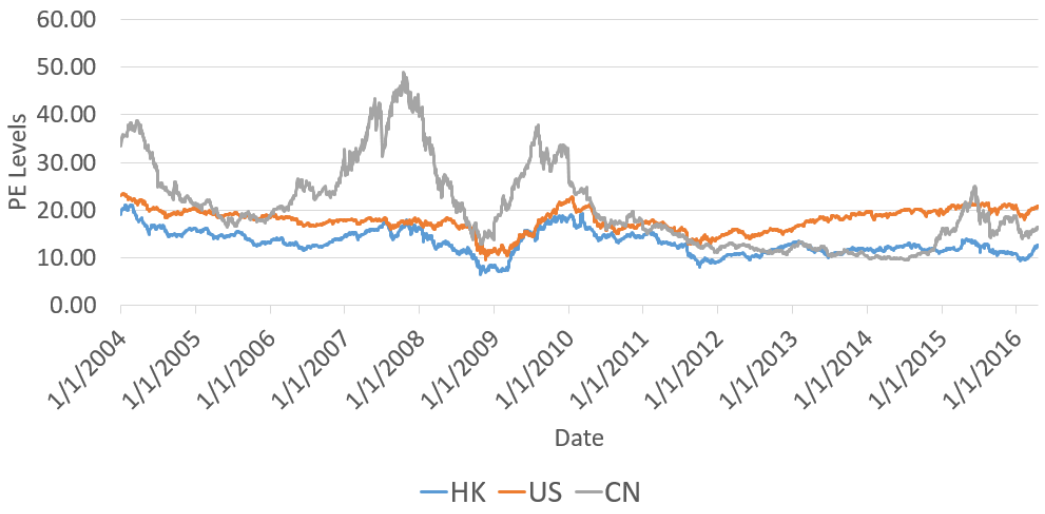


The data shows that US has been an attractive destination for Chinese companies that have little or negative income at issue. Also, the vast majority of the Chinese companies going public had net incomes at issue that are below US$ 100 million.

Describing the PE Data

PE differences among the three destinations are important factors that might influence a company's choice of the IPO venue because, by intuition, companies would want to achieve the highest valuation possible for its share offering, leaving no money on the table. Since the Cap IQ IPO dataset does not provide the PE differences among the three destinations at issue, I collected daily trailing-twelve-month PE of the S&P 500 Index (US), Shanghai Stock Exchange Composite Index (CN), and Hang Seng Index (HK) from January 1st, 2004 to December 31st, 2015 from Datastream and Bloomberg. Here is what the data look like in a line plot in chart 14.

Chart 14: Trend in PE levels of CN, HK, and US between 2004 and 2015



If we assume PE level as a proxy for IPO valuation, CN was valuing companies the highest among the three destinations right up till around 2012. On the other hand, HK's valuation has been consistently lower than those of the other two destinations over the past 12 years. As we have seen in the graphs earlier, HK, however, has been consistently getting Chinese IPOs in the

past 12 years, and not every company remained in CN to get listed before 2012 either. Therefore, the listing choices of Chinese companies go well beyond the consideration of obtaining the highest valuation.

Part 4: Description of the Statistical Methodology Used in This Study

Explaining the Use of Nominal Logistic Regression

The statistical analyses in this paper were conducted using the Nominal Logistic Regression function in Minitab 17. Nominal Logistic Regression a suitable model for the task at hand as it predicts the probabilities of the different possible outcomes of a categorically distributed dependent variable, given a set of independent variables (which may be real-valued, binary-valued, categorical-valued, etc.). In this case, the categorically distributed dependent variables are the three IPO destinations – HK, CN, and US, which are discrete and have no natural order.

The idea behind a Nominal Logistic Regression model is to construct a linear predictor function that formulates a probability from a set of weights times the "characteristics" of a given observation. Ultimately, this model will give the probability of listing in CN, HK and US

respectively for a given IPO candidate with certain characteristics (industry classification, net income at issue, etc.) under the assumption that these are the only three destinations available. As explained in earlier section, Chinese companies may pursue, and historically have pursued, IPOs outside of these three destinations; but for the purpose of this study, we assume that CN, HK, and US are the only available options.

To arrive at the probabilities, the Nominal Logistic Regression model uses a linear function to predict that the observation i has outcome k:

$$f(k,i) = B_{0,k} + B_{1,k}x_{1,i} + \cdots + B_{n,k}x_{n,i}$$

for n data inputs for an observation i. Put in vector form:

$$f(k,i) = B_k \cdot X_i$$

Where X_i is a set of "characteristics" x_i in vector form describing the observation i, or the variable input for the regression. For example, in this study x_i could be industry classification. B_k is a vector of weights (regression coefficients) for outcome k.

For K number of possible outcomes, we run K-1 regressions in which one outcome is chosen as what the model calls the reference event. If outcome K is chosen as the reference event, we have:

$$ln\frac{\Pr(Y=1)}{\Pr(Y=K)} = B_k \cdot X_i$$

for Y=1 to Y=K-1. The result of this regression tells us the likelihood of choosing Y=1 over Y=K. In our case, K=3 (US, HK, CN), so we only perform 2 regressions with 1 reference event

and then we change the reference event and perform one more regression so that we know the complete relationship across all three IPO destinations.

By solving the equation above, the probability that scenario Y=y will occur is given by this formula:

$$\Pr(Y = y) = \frac{1}{1 + \sum_{k=1}^{k-1} e^{B_k \cdot X_i}}$$

This is assuming that all K of the probabilities sum to 1, meaning that a company can only choose between HK, US and CN for an IPO in this study. When vectors for more than one observations are used, X_i becomes a matrix with n rows (n number of IPOs for each observation) and m columns (when m observations, i.e. a company's m characteristics in this case, are used). For example, if both industry and net income at issue are used as observations and since we have 846 IPOs in this study, X_i will be an 846 by 2 matrix.

While this model can eventually calculate the probabilities of going IPO in each destination for a given company, Minitab unfortunately does not provide these probability numbers in its reports. On the other hand, it calculates odds ratio, which can be seen as a proxy for the probabilities that we are interested in. The odds ratio is defined by:

$$e^{B_k \cdot X_i} = \frac{\Pr(Y = 1)}{\Pr(Y = K)}$$

Simply put, an odds ratio tells how many times more likely that scenario Y=1 will occur more than the reference event Y=K. In our case, if Y=1 is choosing CN and Y=K is choosing HK, the odds ratio is how many times more likely that a company will choose CN over HK as the venue for IPO.

As a result, to interpret the Minitab reports for each regression analysis, we need to closely examine the odds ratios. As in any regression, another important statistic that we should be interested in is p-value, which tells us the reliability of any relationship that we might observe.

The Significance and the Handling of Categorical Variables in a Regression

In this Nominal Logistic Regression model, we have categorical variables for both dependent and independent variables. In statistics, a categorical variable is a variable that can take on one of a limited, and usually fixed, number of possible values, thus assigning each individual to a particular group or "category.[9] In this study, some of the categorical predictor variables include industry group and net income group (positive or negative net income at IPO for example). For the ease in statistical processing, categorical variables may be assigned numeric indices. For example, in our case, 1 is assigned to a company for being in TMT and 0 for not. In general, the numbers assigned are arbitrary, and have no significance beyond simply providing a label for a particular value. In other words, the values in a categorical variable exist on a nominal scale: they each represent a logically separate concept, cannot necessarily be meaningfully ordered, and cannot be otherwise manipulated as numbers could be.

Categorical variables can be included as independent variables in a regression analysis or as dependent variables in logistic regression, but must be converted to quantitative data in order to be able to analyze the data. I did so through the use of coding systems. Analyses are conducted such that only K -1 (K being the number of groups) are coded. This minimizes redundancy while still representing the complete data set as no additional information would be gained from coding the total K groups: for example, when coding net income group (where K = 2: negative net income at issue and positive net income at issue), if we only code positive net income at issue,

[9] The Practice of Statistics (2nd ed.), Yates, Daniel S.; Moore, David S; Starnes, Daren S, New York: Freeman, 2003

everyone left over would necessarily be companies with negative net income at issue. In general, the group that one does not code for is the group of least interest since regression does not produce results for the group that is not coded.

Explaining the Use of Effects Coding in Categorical Predictor Variable

In this study, I used the effects coding method (1 and -1) when handling categorical predictor variables. In the effects coding system, data are analyzed through comparing one group to all other groups. Unlike dummy coding (1 and 0), there is no control group. Rather, the comparison is being made at the mean of all groups combined. Therefore, one is not looking for data in relation to another group but rather, one is seeking data in relation to the grand mean.[10] In other words, using effects coding eliminates the biases that might result from choosing a particular control group. In this study energy companies were chosen to be the group that was not coded. Effects coding was done through by assigning -1, instead of 0 in the dummy coding system, for energy companies not being in any of the six other industry groups and 1 for being in the energy industry. The decision to leave out energy companies was because the overall Chinese IPO activities consisted a relatively small portion of energy companies between 2004 and 2015, as shown earlier in Chart 4 in Part 3.

[10] Applied Multiple Regression/Correlation Analysis for The Behavioral Sciences (3rd ed.), Cohen, J., Cohen, P., West, S. G., & Aiken, L. S, New York, NY: Routledge, 2003

Part 5: The Statistical Analyses

Explaining the Predictor Variables in the Model

I regressed the dependent variable IPO destinations against the following 11 predictor variables: industry classification (excluding energy) in six separate variables with dummy (1,0) assigned to each company (excluding energy) for being and not being in a particular industry; PE differences among CN, HK, and US at IPO in three separate variables; 90% winsorized gross proceeds raised in IPO; finally, whether the company had positive net income at issue with dummy (1,0) assigned to each company for having and not having positive net income at issue.

As explained in Part 4, regression analyses with categorical predictors are conducted such that only K -1 (K being the number of predictor groups) are coded. For this reason, while we

have seven industry groups, because industry classification is a categorical predictor, we have to choose one industry group that the model will not produce results so that the model can work. In this case, I have left out energy companies. I also had to leave out results for the category where companies have net loss at issue. Instead of using the net income at issue data as-is, I decided to turn them into a categorical variable. Since the four exchanges' listing standard examine whether a company has positive net income at issue, the absolute value of net income matters less than whether it is positive or not; and since it is by default that companies with negative net income would not list on SSE given its profitability rule, I decided that the results for the positive net income at issue category would be more insightful and, thus, left out the negative group. It is important to note, however, while the model did not produce results for energy companies and the negative net income group, it did take into consideration the influences of these group when producing results for the other groups because we have used effects coding for the categorical predictors.

I also performed a 90% winsorization of the gross proceeds raised data, where I replaced the values above 95% percentile with the value at 95% percentile and the values below 5% percentile with the value at 5% percentile. The 95% percentile and 5% percentile values are US$ 2,279 million and US$ 14 million respectivefully. The reason that I performed winsorization is to get rid of abnormal values resulted from mega deals (such as Alibaba's US$ 22 billion IPO) and from dubiously small offerings (such as Shanghai Dasheng's US$ 0.7 million IPO) so that the result of the regression is representative of the majority of the IPOs.

Finally, it is also important to note that this regression was only able to analyze 750 out of the 846 IPO cases collected from Cap IQ because the other 96 cases lack data in proceeds raised or net income at issue or both.

The Results

Table 4 below summarizes the findings from the regression. The results highlighted in yellow are statistically significant and, thus, can be used for interpretation. (See Exhibit C1 and C2 in the Appendix C for the complete Minitab reports)

Table 4: Summary Results of Regressing IPO Destinations against All 11 Specifications

Independent Variable	Logit (in IPO destination)	Coefficient	P-value	Odds Ratio	Interpretation
Consumer	US/CN	-0.199	0.670	0.82	No relationship concluded
	HK/CN	0.150	0.516	1.16	
	US/HK	-0.349	0.420	0.71	
FIG	US/CN	0.622	0.353	1.86	No relationship concluded
	HK/CN	0.462	0.123	1.59	
	US/HK	0.160	0.789	1.17	
Healthcare	US/CN	0.650	0.270	1.91	No relationship concluded
	HK/CN	0.194	0.559	1.21	
	US/HK	0.453	0.394	1.57	
Industrial	US/CN	-1.657	0.000	0.19	CN is the most preferred
	HK/CN	-0.975	0.000	0.38	
	US/HK	-0.682	0.068	0.51	
Real Estate	US/CN	0.781	0.129	2.18	HK is preferred over CN
	HK/CN	0.909	0.004	2.48	
	US/HK	-0.128	0.770	0.88	
TMT	US/CN	1.691	0.000	5.43	US is the most preferred
	HK/CN	-0.333	0.149	0.72	
	US/HK	2.025	0.000	7.58	
PE_{US} - PE_{CN}	US/CN	-0.378	0.000	0.68	No preference across destinations
PE_{HK} - PE_{CN}	HK/CN	0.209	0.000	1.23	
PE_{US} - PE_{HK}	US/HK	-0.189	0.005	0.83	
Gross Proceeds Raised	US/CN	-0.001	0.004	1.00	No preference across destinations
	HK/CN	0.000	0.047	1.00	
	US/HK	-0.001	0.022	1.00	
Positive NI at IPO	US/CN	-3.955	0.000	0.02	CN is the most preferred
	HK/CN	-2.220	0.004	0.11	
	US/HK	-1.734	0.000	0.18	

Part 6: Interpreting the Results

The regression revealed five relationships that are worth investigating. They are examined in detail in the following.

TMT Sector's Strong Preference for US IPOs

The regression results showed that the probability of Chinese TMT companies opting for an IPO in the US is five times higher than that in CN and seven times higher than that in HK. With nearly zero p-values, the preference for US IPOs is very strong and obvious. This preference mainly stems from two reasons. First, Chinese TMT companies prefer to go public outside of China because they would like to attract foreign investors. The overwhelming presence of the variable interest entities ("VIE") structures among these companies is an obvious manifestation of their liking for foreign investors. Among the US-listed Chinese TMT companies that were analyzed in this study, 83% of them uses VIE structures. As mentioned in Part 2, VIEs were created to bypass Chinese FDI regulations, and because of the complexity and the high costs of setting them up, they are only created in situations when the companies are certain about involving foreign investors. Hence, their existence is a good indicator of Chinese companies' need for foreign capital.

We now know that the need for foreign investment drives Chinese TMT IPOs to ex-mainland markets. This reason alone, however, does not explain why US is their most preferred destination since HKEx also permits the use of VIEs and provides access to foreign investments. The reason that Chinese TMT companies particularly favor US over HK is that listing requirements are less stringent in the US, especially in Nasdaq. Nasdaq Global Market (GM) is a well-known exchange in the US that provides high media exposure and abundant liquidity. As shown in the table 5 below, for a premier exchange like Nasdaq GM, its listing requirements are

relatively low.[11] As long as a company meets any of the income, equity, market value, or asset/revenue standard, it would qualify for a listing. Table 5 below shows the financial requirements for a listing on the Nasdaq Global Market.

Table 5: Financial Requirements for a Nasdaq Global Market Listing Candidate

Requirements	Income Standard	Equity Standard	Market Value Standard	Total Assets/Total Revenue
Stockholders' equity	US$ 15 million	US$ 30 million	-	-
Bid price	US$ 4	US$ 4	US$ 4	US$ 4
Market makers	3	3	4	4
Corporate governance	Yes	Yes	Yes	Yes
Total shareholders (round lot shareholders)	400	400	400	400
Publicly held shares	1.1 million	1.1 million	1.1 million	1.1 million
Market value of publicly held shares	US$ 8 million	US$ 18 million	US$ 20 million	US$ 20 million
Other	US$ 1 million of income from continuing operations before income taxes in latest fiscal year or in two of last three fiscal years	2 years of operating history	US$ 75 million of market value of listed securities	US$ 75 million of total assets and US$ 75 million of total revenue in latest fiscal year or in two of last three fiscal years

On the contrary, HKEx's Main Board has more demanding listing requirements, as shown in table 6 below:

Table 6: Financial Requirements for a HKEx Main Board Listing Candidate[12] [13]

[11] Listing in the US – A Guide to a Listing of Equity Securities on Nasdaq and NYSE, PwC
[12] Listing PRC companies in Hong Kong using VIE structures, Charltons

Financial Performance	1. Profit Test	2. Market Cap/Revenue/Cash Flow Test	3. Market Cap/Revenue Test
Must Fulfill 1 of the 3 Tests	- Recent past year's net profit greater than HK$ 50 million	- Market cap of at least HK$ 2 billion at issue	- Market cap of at least HK$ 4 billion at lising
		- Recent past year's revenue of at least HK$ 500 million;	- Recent past year's revenue of at least HK$ 500 million
		- Aggregate positive cash flow from operating activities for past three years of at least HK$ 100 million	- 1,00 shareholders or above at listing
Operating history, management, and ownership	Under the management continuity for the past three financial years; most recent financial year under the same ownership and control		
Minimum market cap and number of shareholders	Total market cap of at least HK$ 200 million at the time of listing if applying through the profit test; market cap of at least HK$50 million held by the public at the time of listing; at least 300 shareholders at the time of listing		
Public float	At least 25% in public hands at all times; the class of securities for which listing is sought must not be less than 15% of the total issued share capital, with minimum market cap of HK$ 50 million; public float can be lowered to 15% if market cap is more than HK$ 10 billion at the time of listing at the discretion of the exchange; three largest public shareholders cannot hold more than 50% of the securities in public hands		

Nasdaq is a lot more tolerant in terms of listing candidates' profitability. For example, its income standard only requires US$ 1 million while HKSE seeks for HK$ 50 million (US$ 6.5 million) at the time of IPO. In fact, in this dataset, 71% of the US-listed Chinese TMT companies had a net income at issue that was smaller than US$ 6.5 million. This decisive distinction was shown by regressing Chinese TMT companies' IPO destinations against their net income at the offer. The analysis showed if a company has less than US$ 6.5 million in net income at the time of IPO, it is highly more likely to go public in the US than in Hong Kong with an overwhelming odds ratio at 9.04 times. (See Exhibit C3 in the Appendix C for the complete Minitab reports) Moreover, TMT companies often have negative incomes at IPOs given their tendency to go public early in their corporate lifetime. The Nasdaq market is also more forgiving toward this than HKSE; its equity standard is much lower than the HK$ 2 billion (US$ 260 million) in

[13] Alibaba's IPO Dilemma, Emir Hrnjic, Ivey Publishing, December 2014

market capitalization and HK$ 500 million (US$ 65 million) in revenue at issue required by HKSE. As a result, we see 87% of the companies with negative incomes at IPOs chose to go public in the US.

To sum up, we can conclude that, in majority of the cases, Chinese TMT companies favor getting listed in the US, especially on Nasdaq, because of their needs for foreign investments and US exchanges' easy financial listing requirements. It is important, however, to note that these two factors are not the only deciding factors encouraging Chinese TMT companies to list in the US. Many other less prevalent, case-by-case factors also influence the decision. For example, one deciding factor for Alibaba's NYSE IPO was its insistence on a dual-class voting structure, which was rejected by HKSE.

Chinese Industrial Companies Prefer IPOs in the Mainland Market the Most

The 0.19 US/CN odds ratio and 0.51 HK/CN odds ratio mean that the probability of Chinese industrial companies opting for an IPO in CN is five times higher than that in the US and three times higher than that in HK. The nearly zero p-values indicate that Chinese industrial companies' preference for CN IPOs is very strong.

Many of the industrial companies in China have roots that are tied to the local or central government whether it is because they are state-owned or the government is their largest client. These ties mean that some of the motivations for their business activities might not be purely economic but political. This might be the reason why that they overwhelmingly prefer to go public in China since overseas investors are likely scrutinize them for any non-economic decision-making and discount their valuations of these companies while Chinese investors are less sensitive to such political ties in a government-centric society.

The politics-motivated business decision-making among Chinese companies was most evident during implementation of the 2009 RMB 4 trillion (US$ 620 billion) stimulus package. To counter the impact of the global financial crisis happened in 2008, the Chinese government embarked on an unprecedented building spree directed by this stimulus package and carried out by the Chinese industrial companies. A whopping 75% of the total package was spent on building railroads, highways, airports, electricity grids, and housing, which eventually turned into the infamous Chinese ghost towns across the country.[14] What was more troublesome was that the local and central government actually only contributed 30% of the total package in grants and subsidies; it ordered the industrial companies to gather the majority of the remaining 70% through bank loans and corporate debt issuances.[15] Fast-forward to today, many companies are facing defaults on their corporate debts. Here is select list of industrial companies that have defaulted on their payments in 2016 compiled by Wall Street Journal:

Table 7: A List of Select Chinese Industrial Companies that Have Defaulted in 2016[16]

Issuer	Amount (in RMB millions)	Default Date
Shanghai Yunfeng	6,600	January
Guangxi Non-Ferrous Metals	1,000	Feburary
Dongbei Special Steel	800	March
Shanxi Huayu of Chinacoal	600	April
Zibo Hongda Mining Industry	400	March

The overcapacity and sour investments resulting from the politics-driven 2009 stimulus package are the main reasons why these companies are in serious financial troubles. Overseas investors

[14] Understanding the Chinese Stimulus Package, Barry Naughton, China Leadership Monitor No. 28
[15] ibid
[16] China's Missed Opportunities to Kill Zombie Companies, Anjani Trivedi, Wall Street Journal, April 11, 2016

are very cautious with such companies. Shanghai Yungfeng's parent company SPG Land's share price on HKEx dropped 25% in a month after Yungfeng's default in January per Bloomberg data. The most revealing part of the story is that WSJ was able to compile this list because these companies are either directly HKEx listed or subsidiaries of HKEx listed Chinese industrial companies. This list would have been a lot longer if WSJ were able to investigate the companies listed on SSE where companies do not necessarily have to disclose their difficulties in meeting payments. Imagine these companies were listed in the US where corporate governance standard is much higher and shareholder activism prevails. Investors could have spotted the risks involved in these political projects and voted to not undergo these projects back in 2009. Savvy international investors might also urge today's indebted companies to file bankruptcies instead of becoming zombie companies who are at the mercy of government's will as it cherry-picks companies in a recent debt-for-equity program to alleviate indebtedness for only select industrial companies.

PE Differences Across Destinations Have Limited Impact on the Listing Choice

We would presume that valuation plays a huge part in influencing a Chinese's company's listing choice since logically a company would want to reach the highest valuation possible in an IPO; but this is not actually what the regression results suggest. Chinese companies are only 1.2 times more likely to list in HK than in CN when HK's PE is higher. On the other hand, the model even shows a weak inverse relationship between US's valuation premium and Chinese companies' tendency to list there. There are a few possible explanations as to why valuation premiums, expressed in the form of PE differences, have so little impact on the listing decision.

First, because of the IPO freezes in China, companies often were forced to list in the US or HK even though China could be offering the highest valuation at the time. To extrapolate this

reasoning further, companies might from the beginning rule out a mainland IPO if they were in dire need of capital because the Chinese markets could suspend new listings at any time. Next, SSE's requirement for positive net income at issue prevents companies with negative net income from taking advantage of China's higher PE level as well.

Nonetheless, I performed another regression that excluded IPOs in years when there were IPO freezes in China and also IPOs where the listing company had negative net income at issue. There was still no apparent relationship. (See Exhibit C4 in the Appendix C for the complete Minitab reports) Therefore, we are left with two credible explanations to the weak relationship between valuation level and IPO destination. First, the weak relationship might be a result of the time lag between when a company decides to go IPO and when it actually get listed. The PE data I use in this study is the PE on the offer date, which is months after a company has decided to go public. As mentioned in Part 2, the quickest IPO application process takes about 4 months. On top of this, the planning before actually applying, for example setting up the offshore corporate structure, is also equally if not more time-consuming than the application process itself. Therefore, the time between deciding to go public and finally getting listed could go well beyond a year, enough time for valuation level in a particular market to have a substantial change. Furthermore, if during the one-year pre-IPO period, for example, China's valuation skyrockets, companies pursuing overseas listing might want to list in China instead; but they are then discouraged by the unpredictability of possible IPO freezes during bull markets, thus ending up with IPOs overseas where valuations are lower. This might be the reason why we see an inverse relationship between US's valuation premium and Chinese companies' tendency to list there.

A second explanation to the weak relationship between valuation level and IPO destination is that Chinese companies might be interested in sector-specific valuations instead of

the general market's valuation at the time of IPO. For example, I also downloaded the daily trailing-twelve-month PE for Nasdaq 100 index, which is a technology-heavy index, between 2004 and 2015 from Bloomberg. During this period of time, Nasdaq 100 index has a PE level that was on average 6.59 higher than that of S&P 500 index. Therefore, it is possible, for example, that a Chinese company came to the US for an IPO because US was offering the highest valuation among the three destinations specifically for technology companies despite that S&P 500 in the meantime could be trading below both Shanghai Composite and Hang Seng Indices in terms of PE level.

CN is the Most Popular IPO Destination for Companies with Positive Net Income at Issue

Chinese companies with positive net income at issue prefer IPOs in CN the most with odds ratio at 50 times over US and nine times over HK and nearly zero p-values.

Given a company meets SSE's demanding listing standard, it tends to prefer being a public company in China because it is just a lot more convenient financially, logistically, and managerially than in the US or in HK. First, it is relatively inexpensive to be a public company in China. Local underwriters charge relatively low rates compared to international banks for an IPO, and staying domestic means the company also does not need to retain additional foreign legal representation, which could cost a fortune. Moreover, SSE's listing and annual fees are by far the lowest among the four exchanges as mentioned in Part 2. Logistically, there are also fewer problems as the company does not need an offshore structure.

Finally, it is easier for Chinese to manage a company listed in China and attract Chinese money than to be listed overseas and please the foreign investors. Chinese investors often are familiar with these companies and the macro-environment they operate in. Hence, a company's

management does not need to spend time and money to educate these investors about the value of their company as much as they would to foreign investors who might have never used their products or services or even heard of their name before their IPOs. Moreover, the management can avoid the information cost in understanding the foreign investors, markets, and regulations. Most importantly, investors are much less aggressive in China than overseas. There is little shareholder activism in China and corporate governance expectations are much lower since a large portion of the investor base is retail investors who are short-term holders and often pick companies not based on fundamentals but on speculative reasons. Given the much more convenient life in China as a public company, the preference for it makes sense when a company can suffice SSE's listing standard and has enough cash flow to wait out an IPO suspension.

The Size of Offering Has No Impact on the Listing Choices

The size of an offering might influence a company's choice of listing venue because, first, to successfully issue a mega-size deal, a company would want to list in an exchange with abundant market liquidity. Perception wise, HK and the US are believed to offer more market liquidity than CN due to their longer histories and a larger presence of institutional investors in these two markets. Factually, this is not true. As the data shows in Part 2, SSE actually had share turnover in value comparable to that in Nasdaq or NYSE in December 2015. In terms of total market capitalization, even though SSE is still way behind Nasdaq or NYSE, it has already surpassed HKEx by over US$ 1 trillion. If a company's goal is to issue a mega size deal, any of the four markets would be able to provide enough market liquidity to successfully complete the issue.

The size of the offering might influence a company's choice of listing venue also because a company might want to do a very small offering, and a small offering like US$ 50 million,

while is a decent offering size on SSE, might not excite HK and US's large institutional investors whose portfolios are measured in trillions. However, the model showed that small offering size does not deter Chinese companies to list in HK or US. The reason is that Nasdaq, NYSE, and HKEx now all have dedicated small-cap sub-exchanges that cater specifically toward these deals and they have built a separate set of investor following that specifically invest in small-cap stocks.

Part 7: Concluding Remarks

To sum up, we have closely examined the major distinctions among SSE, HKEx, Nasdaq, and NYSE in the context of a Chinese IPO, and the statistical analyses of Chinese IPOs between 2004 and 2015 have helped us understand how these distinctions impact the listing choices of different Chinese companies in different ways. The regression results revealed five clear relationships that are likely to continue to hold true in the future given there is no major changes to the distinctions among the four exchanges and to the capital-raising objectives of Chinese companies. Thus, the findings of this study hopefully can provide guidance to Chinese companies in choosing a listing destination in the future.

On the other hand, the Chinese financial market is ever-evolving. There are currently proposals in the Congress to eliminate certain FDI restrictions and to convert the IPO process to registration-based so that the listing wait time will become predictable and much shorter. Meanwhile, the Chinese venture capital (VC) industry has been developing at an exponential rate in recent years, providing an alternative capital-raising channel for pre-IPO companies. In 2015, VCs in China raised a record-breaking US$ 231 billion in funds, or nine times the offering size of Alibaba's IPO[17]. Hence, the interpretations of the findings can also provide insights into the listing choices of future Chinese IPOs in light of new changes to SSE's operations and to the capital-raising objectives of Chinese companies in the future. For instance, in the case of Beijing Baofeng Technology and some other Chinese TMT companies, we are already seeing them choosing to wait till they qualify for IPOs in China instead of listing in the US prematurely with

[17] Inside China's Historic $338 Billion Tech Startup Experiment, Shai Oster and Yilun Chen, Bloomberg, March 8, 2016

a net loss because the abundant funding from Chinese VCs can afford them the wait and cause foreign investment to be less attractive[18]. Such a phenomenon is consistent with our interpretations of the findings. Choosing where to go public is an elaborate decision. My wish is that with this study, people can better understand the listing choices of past Chinese IPOs and consequently, use this understanding as guidance for the listing choice of future ones.

[18] Chinese Tech Companies Shifting from US to Mainland Stock Exchanges for IPO, Tracey Xiang, Technode, March 30, 2015

Appendix A: Fee Charts

SSE Main Board Initial Listing Fee and Annual Fee Schedule[19]

Fees charged by the Exchange

Initial listing fess

The initial listing fee for the Main Board and SME is as follows:

- RMB 300,000 if the total amount of the shares is no more than 200 million;
- RMB 450,000 if the total amount of the shares is no more than 400 million;
- RMB 550,000 if the total amount of the shares is no more than 600 million;
- RMB 600,000 if the total amount of the shares is no more than 800 million; or
- RMB 650,000 if the total amount of the shares is more than 800 million.

The initial listing fee for the ChiNext Board is at a 50% discount to the fees listed above.

Annual listing fee

The annual listing fee for the Main Board and SME is as follows:

- RMB 50,000 if the total amount of the shares is no more than 200 million;
- RMB 80,000 if the total amount of the shares is no more than 400 million;
- RMB 100,000 if the total amount of the shares is no more than 600 million;
- RMB 120,000 if the total amount of the shares is no more than 800 million or
- RMB 150,000 if the total amount of the shares is more than 800 million.

[19] The China Stock Exchange – IPO Overview, David Zhu, Boss & Young

HKEx Main Board Initial Listing Fee Schedule[20]

Monetary Value of Equity Securities to be Listed (HK$ million)			Initial Listing Fee (HK$)
Not exceeding:	100		150,000
	200		175,000
	300		200,000
	400		225,000
	500		250,000
	750		300,000
	1,000		350,000
	1,500		400,000
	2,000		450,000
	2,500		500,000
	3,000		550,000
	4,000		600,000
	5,000		600,000
Over	5,000		650,000

Notes:

1. For secondary listings on the Main Board, the initial listing fee is normally 25% of the fees listed above, subject to a minimum payment of HK$150,000.
2. For transfer from GEM to the Main Board, the initial listing fee payable by GEM listed issuer is at 50% discount.

HKEx Main Board Annual Listing Fee Schedule[21]

Nominal Value of Listed Equity Securities (HK$ million)			Annual Listing Fee (HK$)
Not exceeding :	200		145,000
	300		172,000
	400		198,000
	500		224,000
	750		290,000
	1,000		356,000
	1,500		449,000
	2,000		541,000
	2,500		634,000
	3,000		726,000
	4,000		898,000
	5,000		1,069,000
Over	5,000		1,188,000

[20] HKEx Website
[21] ibid

Nasdaq Global Select and Global Markets Initial Listing Fee and Annual Fee Schedules[22]

2016 Fee Schedule Nasdaq Global Select and Global Markets

Domestic and Foreign Issues (excluding American Depositary Shares)

Total Shares Outstanding	NASDAQ GLOBAL MARKET 2016 Standard Annual Fee	NASDAQ GLOBAL MARKET 2016 All-Inclusive Annual Listing Fee*
Annual Fees		
Up to 10 million shares	$40,000	$45,000
10+ to 50 million shares	$40,000	$55,000
50+ to 75 million shares	$46,500	$75,000
75+ to 100 million shares	$69,000	$100,000
100+ to 125 million shares	$93,000	$125,000
125+ to 150 million shares	$125,000	$135,000
Over 150 million shares	$125,000	$155,000
Listing of Additional Shares Fees		
	For U.S. companies and foreign companies that file 10Ks, quarterly issuances greater than 49,999 shares, the greater of $.01 per share or $5,000; maximum fee of $65,000 per fiscal year.[1]	No Charge
Other Fees		
Substitution Listing Event	$15,000	No Charge
Changes in Company Record	$7,500	No Charge
Regulatory Fees (e.g., interpretation requests, compliance plan reviews)	Variable	No Charge

American Depositary Shares

ADRs Outstanding	NASDAQ GLOBAL MARKET 2016 Standard Annual Fee	NASDAQ GLOBAL MARKET 2016 All-Inclusive Annual Fee*
Annual Fees		
Up to 50 million ADRs	$40,000	$45,000
50+ to 75 million ADRs	$46,500	$52,500
Over 75 million ADRs	$69,000	$75,000
Listing of Additional Shares Fees		
	For U.S. companies and foreign companies that file 10Ks, quarterly issuances greater than 49,999 shares, the greater of $.01 per share or $5,000; maximum fee of $65,000 per fiscal year.[1]	No Charge
Other Fees		
Substitution Listing Event	$15,000	No Charge
Changes in Company Record	$7,500	No Charge
Regulatory Fees (e.g., interpretation requests, compliance plan reviews)	Variable	No Charge

*The only regulatory fees not included in the All-Inclusive Fee are those for hearings and appeals.

1 For Foreign Private Issuers filing 20Fs, the fee is $7,500 for issuances greater than 49,999 shares per fiscal year.

NYSE Initial Listing Fee and Annual Fee Schedules[23]

NYSE Fee Schedule	
One-time Charge	$50,000
Initial Listing Fee Per Share	$0.0032
Annual Fee Per Share	$0.0010

[22] Nasdaq Website
[23] NYSE Website

Appendix B: Financial Listing Requirements for SSE main board, HKEx main board, Nasdaq GS and GM, and NYSE main board

Financial Listing Requirements for SSE Main Board[24]

Track Record Requirement

Companies seeking a listing on the SSE or the SZSE must meet a minimum of three (3) years track record requirement.

Main Board and SME

For listings on the Main Board and SME, an applicant must meet the following conditions:

- positive net profits for the last three (3) fiscal years, and cumulative net profits for the last three (3) fiscal years that exceed RMB 30 million;
- cumulative net cash flows for the last three (3) fiscal years derived from its business operation that exceed RMB 50 million or cumulative business revenues for the last three (3) fiscal years that exceed RMB 300 million;
- the total value of its stocks before the offering is no less than RMB 30 million;
- the proportion of its intangible assets (deducting land use rights, water-surface farming right, mining right and other rights) at the end of its most recent fiscal period in its net assets that does not exceed 20%; and
- it did not suffer any unrecovered losses at the end of its most recent fiscal period.

[24] SSE Website

Financial Listing Requirements for SSE Main Board (Continued)

Minimum Market Capitalization

The total share capital for a Main Board and SME applicant before the share offering shall be no less than RMB 30 million, while for a ChiNext Board applicant, the total amount of share capital after the listing shall not be less than RMB 30 million.

Sufficiency of Working Capital

There is no specific working capital requirement for an IPO applicant in China. However, a listed company must publicize its interim and annual financial statements.

Eligibility for Electronic Settlement

A listing applicant's shares must be eligible for deposit, clearance and settlement through the electronic platform organized and supervised by China Securities Depository and Clearing Corporation Limited.

Financial Listing Requirements for Nasdaq Global Select Market[25]

The NASDAQ Global Select Market

An issuer, whether a domestic issuer or FPI, must generally meet all the criteria under at least one of the four financial standards and the liquidity requirements stated below:

Financial and Qualitative Requirements	Standard 1	Standard 2	Standard 3	Standard 4
Minimum total revenue in the previous fiscal year	-	US$ 110 million	US$ 90 million	-
Minimum average market capitalization at the time of listing	-	US$ 550 million	US$ 850 million	US$ 160 million
Bid price	US$ 4	US$ 4	US$ 4	US$ 4
Market makers	3 or 4	3 or 4	3 or 4	3 or 4
Corporate governance	Yes	Yes	Yes	Yes
Other	Minimum income from continuing operations before income taxes of: • US$ 11 million over the prior three fiscal years in aggregate and • US$ 2.2 million in each of the two most recent fiscal years Positive income from continuing operations before income taxes in each of the prior three fiscal years	Minimum cash flows of: • US$ 27.5 million over the prior three fiscal years in aggregate Positive cash flows in each of the prior three fiscal years	-	US$ 80 million of total assets and US$ 55 million of stockholders' equity in the most recent publicly reported financial statements
Liquidity Requirements for New Company Listings (IPOs)				
Round lot shareholders or total shareholders	450 or 2,200	450 or 2,200	450 or 2,200	450 or 2,200
Publicly held shares	1.25 million	1.25 million	1.25 million	1.25 million
Market value of publicly held shares	US$ 45 million	US$ 45 million	US$ 45 million	US$ 45 million

[25] Listing in the US – A Guide to a Listing of Equity Securities on Nasdaq and NYSE, PWC

Financial Listing Requirements for Nasdaq Global Market[26]

The NASDAQ Global Market

An issuer, whether a domestic issuer or FPI, must meet all the criteria under at least one of the following financial standards:

Requirements	Income Standard	Equity Standard	Market Value Standard	Total Assets/Total Revenue
Stockholders' equity	US$ 15 million	US$ 30 million	-	-
Bid price	US$ 4	US$ 4	US$ 4	US$ 4
Market makers	3	3	4	4
Corporate governance	Yes	Yes	Yes	Yes
Total shareholders (round lot shareholders)	400	400	400	400
Publicly held shares	1.1 million	1.1 million	1.1 million	1.1 million
Market value of publicly held shares	US$ 8 million	US$ 18 million	US$ 20 million	US$ 20 million
Other	US$ 1 million of income from continuing operations before income taxes in latest fiscal year or in two of last three fiscal years	2 years of operating history	US$ 75 million of market value of listed securities	US$ 75 million of total assets and US$ 75 million of total revenue in latest fiscal year or in two of last three fiscal years

Financial Listing Requirements for HKEx Main Board

Financial Performance	1. Profit Test	2. Market Cap/Revenue/Cash Flow Test	3. Market Cap/Revenue Test
Must Fulfill 1 of the 3 Tests	- Recent past year's net profit greater than HK$ 50 million	- Market cap of at least HK$ 2 billion at issue	- Market cap of at least HK$ 4 billion at lising
		- Recent past year's revenue of at least HK$ 500 million;	- Recent past year's revenue of at least HK$ 500 million
		- Aggregate positive cash flow from operating activities for past three years of at least HK$ 100 million	- 1,00 shareholders or above at listing
Operating history, management, and ownership	Under the management continuity for the past three financial years; most recent financial year under the same ownership and control		
Minimum market cap and number of shareholders	Total market cap of at least HK$ 200 million at the time of listing if applying through the profit test; market cap of at least HK$50 million held by the public at the time of listing; at least 300 shareholders at the time of listing		
Public float	At least 25% in public hands at all times; the class of securities for which listing is sought must not be less than 15% of the total issued share capital, with minimum market cap of HK$ 50 million; public float can be lowered to 15% if market cap is more than HK$ 10 billion at the time of listing at the discretion of the exchange; three largest public shareholders cannot hold more than 50% of the securities in public hands		

[26] ibid

Appendix C: Minitab Outputs for Regression Analyses

Exhibit C1: Minitab Report for Regression with All 11 Predictor Variables with CN as Reference Event

Nominal Logistic Regression: IPO Destination versus Consumer, FIG, ...

Response Information

Variable	Value	Count	
IPO Destination	CN	251	(Reference Event)
	US	86	
	HK	413	
	Total	750	

Logistic Regression Table

Predictor	Coef	SE Coef	Z	P	Odds Ratio	95% CI Lower	95% CI Upper
Logit 1: (US/CN)							
Constant	4.69035	0.932898	5.03	0.000			
Consumer	-0.199192	0.467192	-0.43	0.670	0.82	0.33	2.05
FIG	0.621579	0.668936	0.93	0.353	1.86	0.50	6.91
Healthcare	0.646947	0.586293	1.10	0.270	1.91	0.61	6.03
Industrial	-1.65724	0.388936	-4.26	0.000	0.19	0.09	0.41
Real Estate	0.781126	0.514101	1.52	0.129	2.18	0.80	5.98
TMT	1.69189	0.327812	5.16	0.000	5.43	2.86	10.32
PE Difference at Issue (HK-CN)	0.382470	0.0860953	4.44	0.000	1.47	1.24	1.74
PE Difference at Issue (US-CN)	-0.378433	0.0728037	-5.20	0.000	0.68	0.59	0.79
W-Proceeds Raised	-0.0014042	0.0004867	-2.89	0.004	1.00	1.00	1.00
NI >0	-3.95456	0.803859	-4.92	0.000	0.02	0.00	0.09
Logit 2: (HK/CN)							
Constant	4.27340	0.812383	5.26	0.000			
Consumer	0.149834	0.230449	0.65	0.516	1.16	0.74	1.82
FIG	0.461519	0.299491	1.54	0.123	1.59	0.88	2.85
Healthcare	0.194153	0.331924	0.58	0.559	1.21	0.63	2.33
Industrial	-0.974875	0.154798	-6.30	0.000	0.38	0.28	0.51
Real Estate	0.909079	0.313567	2.90	0.004	2.48	1.34	4.59
TMT	-0.333146	0.231004	-1.44	0.149	0.72	0.46	1.13
PE Difference at Issue (HK-CN)	0.209127	0.0447999	4.67	0.000	1.23	1.13	1.35
PE Difference at Issue (US-CN)	-0.188658	0.0377050	-5.00	0.000	0.83	0.77	0.89
W-Proceeds Raised	-0.0003281	0.0001653	-1.99	0.047	1.00	1.00	1.00
NI >0	-2.22018	0.760389	-2.92	0.004	0.11	0.02	0.48

Log-Likelihood = -574.015
Test that all slopes are zero: G = 266.786, DF = 20, P-Value = 0.000

Goodness-of-Fit Tests

Method	Chi-Square	DF	P
Pearson	1635.90	1466	0.001
Deviance	1131.40	1466	1.000

Exhibit C2: Minitab Report for Regression with All 10 Predictor Variables with HK as Reference Event

Nominal Logistic Regression: IPO Destination versus Consumer, FIG, ...

Response Information

Variable	Value	Count	
IPO Destination	HK	413	(Reference Event)
	US	86	
	CN	251	
	Total	750	

Logistic Regression Table

Predictor	Coef	SE Coef	Z	P	Odds Ratio	95% CI Lower	95% CI Upper
Logit 1: (US/HK)							
Constant	0.416951	0.546812	0.76	0.446			
Consumer	-0.349026	0.432956	-0.81	0.420	0.71	0.30	1.65
FIG	0.160061	0.625506	0.26	0.798	1.17	0.34	4.00
Healthcare	0.452794	0.531567	0.85	0.394	1.57	0.55	4.46
Industrial	-0.682362	0.374217	-1.82	0.068	0.51	0.24	1.05
Real Estate	-0.127953	0.437126	-0.29	0.770	0.88	0.37	2.07
TMT	2.02504	0.287017	7.06	0.000	7.58	4.32	13.30
PE Difference at Issue (CN-HK)	0.0164316	0.0209514	0.78	0.433	1.02	0.98	1.06
PE Difference at Issue (US-HK)	-0.189775	0.0680547	-2.79	0.005	0.83	0.72	0.95
W-Proceeds Raised	-0.0010760	0.0004712	-2.28	0.022	1.00	1.00	1.00
NI >0	-1.73438	0.378069	-4.59	0.000	0.18	0.08	0.37
Logit 2: (CN/HK)							
Constant	-4.27340	0.812383	-5.26	0.000			
Consumer	-0.149834	0.230449	-0.65	0.516	0.86	0.55	1.35
FIG	-0.461519	0.299491	-1.54	0.123	0.63	0.35	1.13
Healthcare	-0.194153	0.331924	-0.58	0.559	0.82	0.43	1.58
Industrial	0.974875	0.154798	6.30	0.000	2.65	1.96	3.59
Real Estate	-0.909079	0.313567	-2.90	0.004	0.40	0.22	0.74
TMT	0.333146	0.231004	1.44	0.149	1.40	0.89	2.19
PE Difference at Issue (CN-HK)	0.0204684	0.0135089	1.52	0.130	1.02	0.99	1.05
PE Difference at Issue (US-HK)	0.188658	0.0377050	5.00	0.000	1.21	1.12	1.30
W-Proceeds Raised	0.0003281	0.0001653	1.99	0.047	1.00	1.00	1.00
NI >0	2.22018	0.760389	2.92	0.004	9.21	2.07	40.87

Log-Likelihood = -574.015

Test that all slopes are zero: G = 266.786, DF = 20, P-Value = 0.000

Goodness-of-Fit Tests

Method	Chi-Square	DF	P
Pearson	1635.90	1466	0.001
Deviance	1131.40	1466	1.000

Exhibit C3: Minitab Report for Regression for Chinese TMT Companies' IPO Destinations against If Net Income at Issue is Smaller than US$ 6.5 Million

Nominal Logistic Regression: IPO Destination versus If NI < 6.5 at Issue

Response Information

Variable	Value	Count	
IPO Destination	HK	57	(Reference Event)
	US	58	
	CN	30	
	Total	145	

Logistic Regression Table

Predictor	Coef	SE Coef	Z	P	Odds Ratio	95% CI Lower	Upper
Logit 1: (US/HK)							
Constant	-0.973449	0.284685	-3.42	0.001			
If NI < 6.5 at Issue	2.20211	0.434476	5.07	0.000	9.04	3.86	21.19
Logit 2: (CN/HK)							
Constant	-0.439367	0.238128	-1.85	0.065			
If NI < 6.5 at Issue	-2.04554	1.06772	-1.92	0.055	0.13	0.02	1.05

Log-Likelihood = -126.702

Test that all slopes are zero: G = 53.858, DF = 2, P-Value = 0.000

* NOTE * No goodness of fit test performed.

* NOTE * The model uses all degrees of freedom.

Exhibit C4: Minitab Report for Regression for IPO Destinations against 9 Predictors, Excluding IPOs in Years of China IPO Freezes and IPOs for Companies with Negative Net Income at Issue

Nominal Logistic Regression: IPO Destination versus Consumer, FIG, ...

```
* WARNING * Algorithm has not converged after 20 iterations.
* WARNING * Convergence has not been reached for the parameter estimates criterion.
* WARNING * The results may not be reliable.
* WARNING * Try increasing the maximum number of iterations.


Response Information

Variable         Value  Count
IPO Destination  CN       213  (Reference Event)
                 US        46
                 HK       258
                 Total    517


Logistic Regression Table

                                                                    Odds     95% CI
Predictor                              Coef    SE Coef      Z      P  Ratio  Lower  Upper
Logit 1: (US/CN)
Constant                           -1.08294    982.398  -0.00  0.999
Consumer                            2.76677    982.398   0.00  0.998  15.91   0.00      *
FIG                                 3.05287    982.398   0.00  0.998  21.18   0.00      *
Healthcare                          2.87524    982.398   0.00  0.998  17.73   0.00      *
Industrial                         0.744572    982.398   0.00  0.999   2.11   0.00      *
Real Estate                         3.43489    982.398   0.00  0.997  31.03   0.00      *
TMT                                 4.30176    982.398   0.00  0.997  73.83   0.00      *
PE Difference at Issue (HK-CN)     0.575386   0.117093   4.91  0.000   1.78   1.41   2.24
PE Difference at Issue (US-CN)    -0.566663   0.102687  -5.52  0.000   0.57   0.46   0.69
W-Proceeds Raised                -0.0019325  0.0008381  -2.31  0.021   1.00   1.00   1.00
Logit 2: (HK/CN)
Constant                            2.19405   0.336912   6.51  0.000
Consumer                           0.115026   0.270719   0.42  0.671   1.12   0.66   1.91
FIG                               0.0188026   0.371156   0.05  0.960   1.02   0.49   2.11
Healthcare                        0.0212898   0.392072   0.05  0.957   1.02   0.47   2.20
Industrial                        -0.957816   0.184225  -5.20  0.000   0.38   0.27   0.55
Real Estate                         1.19841   0.407092   2.94  0.003   3.31   1.49   7.36
TMT                                -0.115164   0.266538  -0.43  0.666   0.89   0.53   1.50
PE Difference at Issue (HK-CN)     0.301326  0.0556673   5.41  0.000   1.35   1.21   1.51
PE Difference at Issue (US-CN)    -0.275755  0.0475461  -5.80  0.000   0.76   0.69   0.83
W-Proceeds Raised                -0.0002986  0.0002077  -1.44  0.151   1.00   1.00   1.00


Log-Likelihood = -399.220
Test that all slopes are zero: G = 160.563, DF = 18, P-Value = 0.000


Goodness-of-Fit Tests

Method    Chi-Square    DF      P
Pearson      1622.10  1006  0.000
Deviance      787.35  1006  1.000
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