Three Essays on Chinese Two-Stage Firms in the U.S.

by

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ABSTRACT

This study investigates the three puzzles with regards to a two-stage IPO strategy in the U.S., namely, underpricing, IPO timing, and long-term performance. Firstly, we find that a two-stage IPO strategy may be suitable for firms who expect to raise public equities, but are highly cost-sensitive. In such an IPO strategy, firms can significantly reduce IPO cost. The public status before IPO might cost extra due to filing cost, etc... We can consider it as the price of an option; an option to conduct IPO with lower cost.

Secondly, we find two-stage firms are similar to the conventional IPO firms. They have similar long-term stock market performance, operating performance, use similar level of earnings management and have similar amount of frauds.

Thirdly, through the investigation on two-stage firm's earnings management, we find that higher earnings management relative to domestic firms, can increase IPO valuation and does not affect after market performance. But higher earnings management relative to the firms in the listing country does not increase IPO valuation. Even worse, it reduces after market performance.

Lastly, we find the two-stage firms with longer time interval between public listing and IPO are likely to have low IPO cost and low earnings management. The two-stage firms with CEO-chairman duality are likely to commit frauds and have long-term underperformance.

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INTRODUCTION

There are three IPO puzzles: IPO underpricing, hot issue market and long-term underperformance. These puzzles are based on the analysis of conventional IPOs which consist of two simultaneous transactions: public listing and initial public offering.

However, the emergence of the Chinese "two-stage" firms in the U.S. offers an opportunity to study the three IPO puzzles by controlling for the effect of public listing. In essence, these Chinese two-stage firms go public by first merging or buying into the shell companies that are listed on junior stock exchanges,[1] then engage in private equity offerings, proceed to shelf-registration offerings or acquisitions, list on senior stock exchanges[2] and finally, conduct IPOs. These Chinese firms use a two-stage IPO strategy: in the first stage, they use reverse mergers to acquire shell companies. This is also referred as backdoor listing. It enables the firms to gain a "public" status. In the second stage, these Chinese firms conduct IPOs to raise public capital. The two-stage IPO strategy allows these Chinese two-stage firms to use two separate transactions for public listing and initial public offering. This is different from the conventional IPO firms who perform public listing and initial public offering in one single transaction. As the existing IPO studies tend to use the conventional IPO samples, we believe that the Chinese two-stage firms could serve as an unique study sample for us to specifically investigate the issues with regard to initial public offering.

[1] OTC Billiton Board and Pink Sheet
[2] NYSE, NASDAQ, and AMEX

Based on the extensive sample of these Chinese two stage firms, this study focuses on many interesting and important issues that are unexplored in the existing literature. These issues include:

(1) What are the costs (direct and indirect) of two-stage strategy?

(2) Does two-stage strategy reduce information asymmetry between firms and investors?

(3) Are two-stage firms high or low quality firms?

(4) What is the operating and stock market performance of two-stage firms?

(5) To what extent are two-stage firms involved in earnings management?

(6) What implications do our findings have for securities regulators and investors?

We attempt to find answers to these questions and the hypotheses presented later in the study using four control samples.[3] In addition to providing a comprehensive documentation of these two-stage firms, we believe that this study fills an important gap in the existing research on IPOs with regard to IPO underpricing and long-term performance; it also contributes to the literatures related to cross-border listing firms, regulatory efficiency, informational asymmetry and information dissemination between firms and investors.

To provide context for the study, Appendix A describes the two-stage strategy followed by Universal Travel Group. In 2006, the firm went public on OTC Bulletin Board through a reverse merger of TAM of Henderson (OTCBB: TMHN). In the same year, Ludlaw Capital Group began issuing research coverage on Universal Travel Group. In 2007, Universal Travel

[3] These four samples are:(1) Chinese domestic IPOs matching with industry and gross proceeds, (2) Chinese domestic IPOs matching with industry and market capitalization, (3) U.S. domestic IPOs matching with industry and gross proceeds, and (4) U.S. domestic IPOs matching with industry and market capitalization.

Group made a series of acquisitions, including Speedy Dragon Enterprise, Xi'an Golden Net, Shanghai Lanbao Travel Service, Foshan Overseas International, and Tianjin Golden Dragon International. In 2008 the firm raised a total of $15.4 million in capital through PIPE (Private Investment in Public Equities) financing. In 2009, the firm hosted a road show to market itself to public investors. It then moved onto New York Stock Exchange (NYSE) and conducted a registered direct offering of $20 million to institutional investors; stock market return on the offering day was 11.7%. On June 16, 2010, Universal Travel Group conducted a $20 million IPO with an underpricing of 11.14%. Brean, Murray, Carret& Co., LLC was the book running manager and Rodman & Renshaw, LLC was the co-manager. Like many other U.S.-listed Chinese firms, Universal Travel Group experienced accounting issues. It changed four independent auditors during the seven-month period from September 2010 to April 2011. In May 2011, a group of law firms filed class actions against Universal Travel Group. The firm was delisted from NYSE on May 9, 2012.

Two-stage strategy is not new. The U.S. domestic firms started to use the strategy since 1990s, but they were much smaller than the Chinese two-stage firms we investigate in this study. Their median annual sales revenue was only $0.33 million, and the median total gross proceeds they raised from PIPE financing and public offering was $7 million. The Chinese two-stage firms, however, raised a total of $8.4 billion proceeds in the U.S.; the average sizes of IPO, shelf registration offering and PIPE financing were $28 million, $57 million and $27 million, respectively. As firm size has been found to be a significant control variable in the finance literatures, we expect that using the Chinese two-stage firms in our study would produce different results from the previous studies on the U.S. domestic firms.

Overall, the Chinese two-stage firms list publicly only in the U.S.; their operating businesses are in China. They claim to come to the U.S. for several reasons. First, because these firms tend to be in the unprotected industries, they are not given the priority to access the Chinese equity market.[4] Because they are young and at development stage, they cannot compete with larger Chinese firms to obtain underwriting services in China's IPO market, either. Secondly, the reported average IPO underpricing in China ranges from 43.1% to 256.9%, comparing to the average of 21.6% in the U.S. (Ritter, 2003, 2014; Huang, 2011; Su and Bangassa, 2011). The significantly high IPO underpricing in China means a very high indirect cost of raising public capital. These Chinese two-stage firms may not be able to afford this cost. Finally, by encouraging two-stage firms to go to overseas capital markets, private equity investors can exit earlier and may potentially generate higher investment returns.[5] The management of two-stage firms also have incentive to list their firms in the U.S., so that they can benefit from the currency diversification effect. In order to bypass the China Security Regulatory Commission's (CSRC) control on foreign direct investment, the Chinese two-stage firms are usually registered as subsidiaries of offshore holding companies.[6] They also use backdoor listing to bypass the Security Exchange Commission's (SEC) mandated listing and disclosure requirements for IPOs in the U.S. (Arellano-Ostoa and Brusco, 2002). While the U.S. security regulators are concerned about the quality of these two-stage firms, the Chinese government worries that the firms impair its capability to control foreign investment. To deal with this

[4] Aharony et al. (1999) reported that the Chinese firms in the protected industries, including petrochemicals, energy and raw materials, are usually large monopolies under the direct supervision of the State Council. These firms are given easier access to the Chinese equity market than companies. Other industries are unprotected.
[5] Varadzhakov (2009) showed that the longer lock-up period following an IPO in China decreases value. On average, the institutional investors who had a three month lock-up period in China gained 21% more than those with a 12-month period.
[6] These holding companies are usually incorporated in the Cayman Islands or British Virgin Islands.

issue, China has been working on creating more financing opportunities for the small and young domestic firms. On April 3, 2012, the CSRC raised the quota for Qualified Foreign Institutional Investors (QFII) from $30 billion to $80 billion.[7] On May 7, 2012, the CSRC announced a plan to develop a nationwide over-the-counter market for non-public companies.[8]

To our knowledge, we have not come across any research on the two-stage firms in the U.S. even for U.S. firms. It is probably due to the small size and small total amount of capital associated with these firms. However, the size and the amount of capital raised by the Chinese two-stage firms in the U.S. capital market is significant and thus worthy of a systematic investigation.

Accordingly, the organization of the study is as follows: the conventional IPO process and alternative routes for public listing are discussed in the next section. Then we introduce our sample collection and descriptive data. This sets the stage and the context for the three essays that follow. In Essay One, we test our hypotheses on the costs and timing of two-stage firm IPOs. Essay Two focuses on earnings management, fraud and auditor choice of two-stage firms. In Essay Three, we investigate the operating and stock market performance of two-stage firms. In Appendix A, we use Universal Travel Group as an example to introduce the two-stage strategy. Appendix B includes a list of Chinese two-stage firms in this study. In Appendix C, we discuss the development of Chinese domestic equity market as it provides the context and the possible motivation for the Chinese two-stage firms to go to the U.S. market. A

[7] http://www.bloomberg.com/news/2012-04-03/china-increases-qfii-by-50-billion-and-rqfii-by-50-billion-yuan.html
[8] http://www.reuters.com/article/2012/05/07/china-otc-idUSL4E8G75BN20120507

discussion on two-stage firm's country risk and choice of listing location is provided in Appendix D. Since we are not testing the location choice decisions in this study, Appendix D simply documents this aspect of cross-border listing for the sake of comprehensiveness. A summary of key previous studies related to this study is provided in Appendix E.

Conventional IPO Process and Alternative Routes for Public Listing

In this section, we describe the conventional IPO process as well as some alternative routes followed by the private firms aiming at public listing and equity financing. In addition, we provide detailed information about the process of a two-stage strategy in the U.S. Our main purpose is to provide an overview of the characteristics of two-stage strategy.

Conventional IPO Process

The conventional IPO process starts by selecting an underwriter with a good reputation and expertise in a specific industry. Typically, a private firm signs a letter of intent with the underwriter to determine the expected offering amount, underwriting fee, overallotment option, indemnification rights, etc. Meanwhile, the underwriter performs due diligence to verify the accuracy of the offering. Then IPO prospectuses are distributed to investors. Some firms also perform road shows to promote their IPOs to institutional investors. The exact IPO offer price and number of shares are determined one day before IPO. On the IPO day, shares are sold to investors, proceeds are collected, and IPO firms go public. Upon the expiration of the "quiet period" underwriters begin to provide research coverage such as comments on

valuation and estimates on earnings for the newly listed firms.[9] They also provide aftermarket support activities such as making market and stabilizing share prices within a short time period.

Underwriting fee is termed as a direct cost of IPO. In the U.S. it is typically 7% of the IPO gross proceeds. Ritter (2014) reported that among the 1259 IPOs from 2001 to 2013, 878 of them had 7% underwriting fee; the average underwriter fee from 1980 to 2013 is 7.2%.[10] We estimate that the average dollar amount of underwriting fee in the U.S. is $5.47 million.[11]

The indirect cost of IPO is typically referred to as IPO underpricing. Ritter and Welch (2002) reported an average underpricing of 18.8% in the U.S. Ritter (2014) updated that the average underpricing was 21.6% during the period from 1990 to 2013; the aggregate amount of money left on the table was $143.5 billion.[12] In almost all cases the firm going through the IPO process also receives a simultaneous public listing on the respective stock exchange(s).

Alternative Routes for Public Listing: SPAC, Backdoor Listing, APO and WrASP

The two popular alternative routes for public listing are Special-Purpose Acquisition Company (SPAC) and backdoor listing. SPAC was initially developed by Early Bird Capital in August

[9] In the U.S., the quiet period is 25 calendar days after the public offering day.
[10] http://bear.warrington.ufl.edu/ritter/IPOs2013Underwriting.pdf
[11] Ritter and Welch (2002) reported that there were 6249 conventional IPOs in the U.S. during the period from 1980 to 2001; these IPOs raised $488.4 billion gross proceeds in total. Therefore, the average gross proceeds were $78.2 million in the U.S. Chen and Ritter (2000) reported that "at least 96 percent of IPOs with expected proceeds of $20 to 80 million paid seven percent spread. For deals below $20 million, spreads are frequently even higher than seven percent". Then he estimated average dollar amount of gross spreadis $5.47 million ($78.2×7% = $5.47).
[12] http://bear.warrington.ufl.edu/ritter/IPOs2013Underpricing.pdf

2003.[13] It is also referred as blank check IPO. A SPAC is usually listed on OTCBB and AMEX. It is a clean public shell company with capital, but without operating businesses. SPAC's management has experience in investment banking or private equities. They have twelve to eighteen months to acquire operating businesses. A successful SPAC requires an agreement between two parties. The SPAC selects the private firm with the desired business model and prospects; the private firm selects the SPAC with the expected amount of capital and listing locations (either on OTC BB or on AMEX). Jog and Sun (2008) reported SPAC's characteristics and aftermarket performance.[14] Worldwide, the green field companies on the Bangladeshi stock exchange are similar to the SPACs in the U.S.[15]

While conventional IPOs and SPACs have public listing and the raising of capital in a single transaction, backdoor listing only enables private firms to go public; it does not involve raising capital. In our study, backdoor listing is the first stage of two-stage strategy. Essentially, backdoor listing is a reverse merger (Figure A). A private firm needs to choose a public shell company that may have gone through bankruptcy with minimal or discontinued operating business and has no potential legal liabilities. Then the private firm bids for this shell company. If the two parties agree to merge, they sign a letter of intent stating the willingness to conduct the reverse merger. During the reverse merger, the shell company provides its public status to the surviving entity in exchange for a portion of ownership (the Result Inc. in Figure A). The private firm merges its operating assets into the surviving entity, becomes its controlling

[13] http://www.venturelawcorp.com/virgin_shells.htm

[14] As SPACs are beyond the scope of our study, we do not provide further details on related research regarding SPACs.

[15] In the 1980s and '90s, due to a shortage of securities in the Bangladeshi stock market, and the lack of a security market oversight entity, approximately 33 Bangladeshi firms with insignificant or no operating history issued public shares. This group of firms are often referred as green field companies. Karim et al. (2000) has detailed information on these companies.

shareholder, and assumes the management role.[16] Adjei et al. (2008) reported that backdoor listing in the U.S. could cost as little as $50,000 and take as short as three months. Many small and young private firms consider backdoor listing a very attractive way to go public.

Financial advisory firms provide underwriting services in backdoor listing as well. Halter Financial Group offers an APO® (Alternative Public Offering) that combines backdoor listing and PIPE financing in one transaction (Figure B). In an APO, Halter Financial Group organises both public shell companies and venture capital for their clients. Many Tier 2 and Tier 3 banks are also very active in APO deals. They work as gatekeepers of firm quality and bring research, liquidity and trading to create markets for their clients.[17] But due to the involvement of investment banks and financial advisory firms the total cost of APO has increased to a level similar to conventional IPO.

The WrASP offered by WestPark Capital combines APO and IPO.[18] WestPark Capital sets up a Form 10-Kshell company[19] for its client, injects PIPE proceeds when the client merges into the shell company, then underwrites the client's IPO (Figure C). The Form 10-K shell company enables the client to list directly onto a senior stock exchange. In response to SEC's concern about "backdoor listing", WestPark Capital argued that WrASPs don't use reverse merger because registration statements cover the period prior to a client's public listing. WestPark Capital also claimed that as clients have to file an S-1 Registration statement and

[16] Upon the closing of a backdoor listing, the public shell company's non-cash assets are often sold off. If and when required, the public shell company's former management would be retained as consultants or members of the board of directors, to provide varied services to the surviving entity.
[17] The service in terms of bringing research, liquidity and trading is provided within an aftermarket period of six months to one year.
[18] http://findarticles.com/p/articles/mi_m0EIN/is_20100524/ai_n53756939/
[19] http://www.venturelawcorp.com/form_10_shell_transactions_wp.pdf

undergo a full SEC review, WrASPs have no less restrictive requirements than the conventional IPO.[20] Nonetheless, WrASPs are criticized for encouraging low quality firms to go public. Many WrASP firms are reported to have accounting issues in the aftermarket.

Two-Stage Strategy

Two-stage strategy uses two separate transactions for the purposes of public listing and public offering (Figure D). It allows a private firm to go public before IPO; but in conventional IPOs and WrASPs, a private firm conducts public listing and public share offering simultaneously. Appendix A shows how Universal Travel Group used two-stage strategy. The firm went public in July 2006 and waited until June 2010 to issue its IPO. Had Universal Travel Group used the conventional IPO process or the WrASP route, its public listing and IPO would have been on the same day.

[20] http://www.wpcapital.com/PDF/WRASP_PROCESS.pdf

Figure A Structure of Backdoor Listing

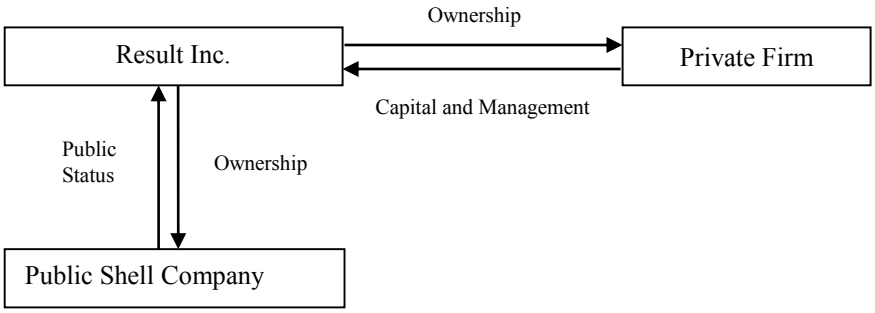


Figure B Structure of APO

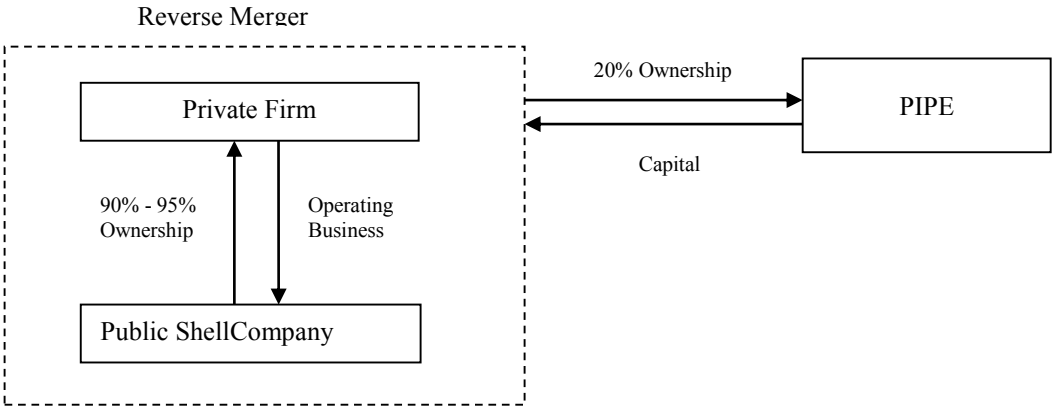


Figure C Structure of WrASP

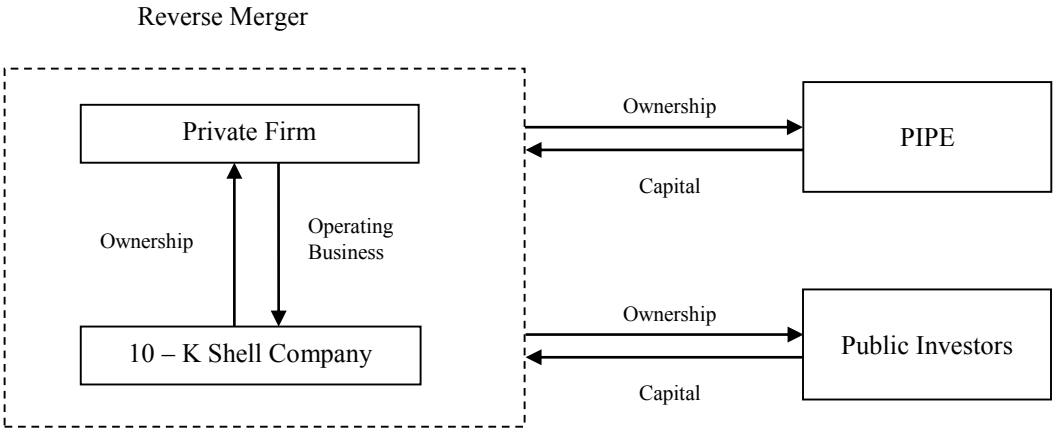
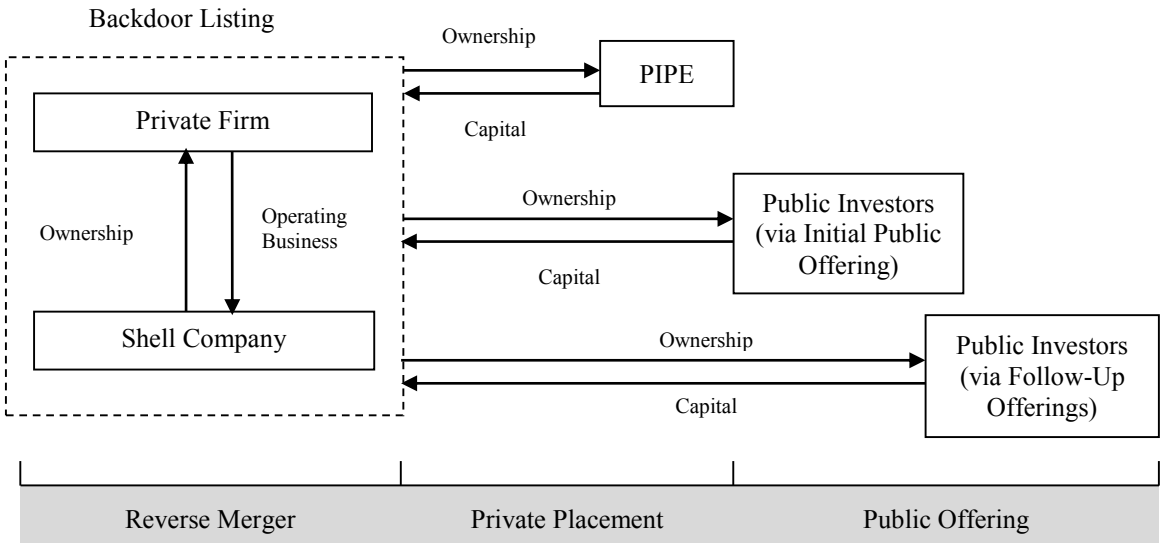


Figure D Structure and Timeline of Two-Stage Strategy



SAMPLE AND DATA

In this section, we describe our sample selection and data collection processes. In addition, we provide descriptive statistics on our two-stage firm sample as well as the conventional IPO samples that are used as control samples in our study.

Sample Selection

We use the LexisNexis academic database to identify the Chinese two-stage firms. The following criteria are applied:

(1) As Floros (2008) reported only three reverse mergers in the U.S. in 1990, we don't expect to find significant amount of two-stage firms during the time period prior to 1990. Therefore, we set our search period from January 1st, 1990 to December 31st, 2012.

(2) Our keywords are "reverse merger", "reverse acquisition", "reverse takeover", and "backdoor IPO".

(3) Then we carefully examine the search results in "Business Wire", "PR Newswire", "US State News", and "Global Newswire".

(4) The Chinese private firms that used backdoor listing and conducted public offerings are two-stage firms.

We also track all the Chinese firms on NYSE, AMEX, and NASDAQ to ensure all the Chinese two-stage firms are included in our sample. Our final list of two-stage firms is shown in Appendix B.

Data

We collect data for both our two-stage firm sample and the control samples of conventional IPOs. The IPO related data is collected from EDGAR, listing date and fraudulent act related data from LexisNexis, corporate actions, financial statements and stock market related data from Bloomberg and Thomson Reuters.

Two-Stage Firm Sample

Table A shows that two hundred and seventy-six Chinese firms used backdoor listing from 2000 to 2012; we do not find any firms prior to 1999. Of these firms, seventy-one (26%) conducted IPOs, thus these firms are two-stage firms we focus on in this study.[21]

Table B shows that fifty-nine (83%) two-stage firms are in consumer staples, consumer discretionary, industrials, information technology, and materials sectors. Only four (6%) two-stage firms are in the energy and utilities sectors, which are considered as the protective industries in China.

In Table C, the total gross proceeds from the two-stage firm IPOs are over $2 billion. Fifty-three (75%) two-stage firms conducted IPOs in 2009 and 2010, a period when the equity market started to recover from the 2008 financial crisis. The number of two-stage firm IPOs then drops to three in 2011 and one in 2012. We also find that two-stage firms raised large

[21] At the time we complete this thesis, we find that firms such as Perfect World, China Mobile Games & Entertainment Group, Focus Media Holdings, continue to use this approach in post-2012 time period.

amounts of capital through private placements and shelf-registration offerings.[22] The total proceeds are $1.74 billion and $3.78 billion, respectively. In addition, twenty-four (34%) two-stage firms issued follow-up equity offerings, with total gross proceeds of $876 million. As this study focuses on IPO, we don't provide further discussion on two-stage firm's private placement, shelf-registration offering or follow-up equity offering.

Table D shows the headquarter locations of two-stage firms. We find that almost half of them are located in the top ten provinces/territories in the trustworthiness index developed by Zhang and Ke (2002).[23] Beijing and Guangdong rank the second and fourth respectively in the index; they have a total of twenty-five (35%) two-stage firm headquarters. Heilongjiang, Shaanxi and Henan have eighteen (25%) two-stage firm headquarters, and rank in the middle of the index. There are three two-stage firm headquarters in Hong Kong, but their operating businesses are in mainland China. Only one two-stage firm headquarter is in the bottom ten provinces/territories in the index.

Table E shows the size of two-stage firms in their IPO year. The median sales revenue and total assets are $98.1 million and $140.1 million, respectively. During the period from 2009 to 2011, the median sales revenue increases from $95.4 million to $196.7 million, while the median total assets decreases from $140.5 million to $110.1 million.

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[22] Shelf registration offering is conducted upon the exercise of a firm's previously issued warrants. The firm will issue new shares to the warrant holders at the price pre-determined in the warrants, then the warrant holders will sell these new shares in the open market to public investors. Therefore, shelf registration offering is different from direct public offering. In addition, as the pre-determined exercise price in warrants is often significantly lower than the market price, only a small portion of the proceeds from shelf registration offerings go to the two-stage firms. Unfortunately, we couldn't find the detailed information regarding the pre-determined price in each warrant.

[23] Zhang and Ke (2002) developed this index to indicate the trustworthiness ranking of the individual provinces/territories in China.

Table F shows that within the three-year period following the IPO, twenty-one (30%) two-stage firms have shares buyback and thirty-four (48%) have acquisitions.

In Table G, we show that on average, two-stage firms take 34 months between their backdoor listing and initial public offering, and take 12.8 months between initial public offering and their first follow-up equity offering.

Control Sample of Conventional IPOs

We use four groups of control samples in this study: (1) Chinese domestic IPOs matching with industry and gross proceeds, (2) Chinese domestic IPOs matching with industry and market capitalization, (3) US domestic IPOs matching with industry and gross proceeds, and (4) US domestic IPOs matching with industry and market capitalization.

We use Chinese domestic IPOs as control sample for the following reasons. First, as the two-stage firm's operating businesses are in China, they are competitors to the Chinese domestic IPOs. Thus the two-stage firms and the Chinese domestic IPOs make appropriate control samples for each other. Secondly, as the two-stage firms choose to issue IPOs in the U.S., the cost of raising capital in China is their opportunity cost. Therefore, the Chinese domestic IPOs are an appropriate cost benchmark for the two-stage firm's IPO. We also use the U.S. domestic IPOs for robustness testing purposes.

We use the matching firm technique in Ritter (1991) and Loughran and Ritter (1995) to select the Chinese and U.S. domestic control samples. The detailed selection process is as follows:

(1) Screen all the conventional IPO firms that match a two-stage firm with at least 2-digit SIC code, then select the firm with similar gross proceeds or market capitalization on IPO day.

(2) Avoid using the same matching firm in two control samples unless there is only one matching firm with available data in an industry.

(3) As many State-Owned Enterprise (SOE) IPOs in China are driven by political factors, they don't serve as appropriate control firms. Therefore, in our control sample selection process, we avoid using the SOE IPOs.

Table H shows the characteristics of our four control samples in this study. There is one case in the Chinese control sample and four cases in the US control samples that we couldn't find two-digit SIC code matches. We have to reduce them down to one-digit SIC code matches. On the other hand, there are eighty cases in the Chinese control samples and forty-six cases in the US control samples that we are able to find firms with 3-digit SIC code matches. This should help improve the robustness of our empirical results.

The median market capitalization of the Chinese control firms with gross proceeds matching (*Ctrl_CHN_Proceeds*) is $109.3 million, comparing to the median of $158.5 million for two-stage firms. It indicates that by controlling for the publicly raised capital, two-stage firms are larger than their Chinese IPO peers. When we control for market capitalization matching (*Ctrl_CHN_MarketCap*), the median gross proceeds for two-stage firms is less than the

median for the control sample ($22.7 million vs. $42.0 million), indicating that two-stage firms tend to raise less public capital. There are very limited amount of U.S. firms that can match with gross proceeds or market capitalization. As we avoid using the same firms in the two U.S. control samples, our market capitalization matching U.S. domestic IPO sample (*Ctrl_US_MarketCap*) has to include several large firms. This leads to the elevated size in gross proceeds and market capitalization. It also indicates that two-stage firms are much smaller in size relative to their U.S. peers.

Table A Gross Proceeds after Public Listing

This table shows the amount of proceeds raised from varied capital raising activities. Private placement is offered to the selected investors and doesn't have to be registered with SEC. Shelf registration offering is conducted upon the exercise of a firm's previously issued warrants; the firm issues new shares to the warrant holders at the price pre-determined in the warrants, then the warrant holders will sell these new shares in the open market to public investors. IPO is a firm's initial public offering. Follow-up public offering is the public equity offering that follows a firm's initial public offering.

Year	Total # of Firms	Private Placement		Shelf-Registration		IPO		Follow-Up Public Offering	
		# of Firms	Proceeds ($ mm)	# of Firms	Proceeds ($ mm)	# of Firms	Proceeds ($ mm)	# of Firms	Proceeds ($ mm)
2000	2	2	15.1	1	41.4	-	-	-	-
2001	2	2	35.0	1	18.6	-	-	-	-
2003	7	7	276.5	5	374.0	2	67.5	-	-
2004	23	23	442.8	13	319.2	11	468.4	7	289.7
2005	22	22	490.1	14	1,119.2	8	205.9	2	212.7
2006	48	48	764.1	32	1,676.1	15	467.5	6	178.7
2007	45	44	372.0	26	618.8	14	281.6	4	113.6
2008	45	44	489.7	19	809.5	10	305.5	4	80.7
2009	28	28	226.3	14	343.8	5	112.0	-	-
2010	31	30	231.2	8	264.6	3	65.1	-	-
2011	6	6	28.8	1	30.7	-	-	-	-
Unknown	17	3	0.0	2	0.0	3	28.6	1	0.8
Total	276	259	3,371.7	136	5,615.9	71	2,002.0	24	876.2

Table B Two-Stage Firms by GICS Sector

GICS sector refers to the Global Industry Classification Standard developed by MSCI and Standard & Poor's. It groups firms into ten categories: Energy, Materials, Industrials, Consumer Discretionary, Consumer Staples, Health Care, Financials, Information Technology, Telecommunication Service and Utilities. A two-stage firm's GICS sector is identified in its IPO prospectus.

Sector	**Two-Stage Firms**	
	N	**%**
Consumer Discretionary	14	20%
Consumer Staples	10	14%
Energy	3	4%
Financials	-	-
Healthcare	4	6%
Industrials	10	14%
Information Technology	9	13%
Materials	16	23%
Telecom	-	-
Utilities	1	1%
Unknown	4	6%
Total	71	100%

Table C Gross Proceeds of Two-Stage Firms

This table shows the amount of proceeds raised from varied capital raising activities. Private placement is offered to the selected investors and doesn't have to be registered with SEC. Shelf registration offering is conducted upon the exercise of a firm's previously issued warrants; the firm issues new shares to the warrant holders at the price pre-determined in the warrants, then the warrant holders will sell these new shares in the open market to public investors. IPO is a firm's initial public offering. Follow-up public offering is the public equity offering that follows a firm's initial public offering.

Year	N	Private Placement		Shelf-Registration		IPO		Follow-Up Public Offering	
		N	Proceeds ($ mm)	N	Proceeds ($ mm)	N	Proceeds ($ mm)	N	Proceeds ($ mm)
2005	1	1	13.5	1	82.1	1	40.4	1	96.3
2006	2	2	37.8	2	0.0	2	52.0	2	16.9
2007	6	6	186.8	6	302.7	6	339.7	2	126.0
2008	5	4	183.1	4	337.8	5	79.8	3	96.4
2009	26	26	739.9	26	1,962.3	26	840.6	12	429.9
2010	27	25	530.2	25	1,005.7	27	560.6	3	100.8
2011	3	3	20.1	3	80.9	3	62.0	1	10.0
2012	1	1	32.7	1	13.0	1	27.0	-	-
Total	71	68	1,744.1	68	3,784.5[24]	71	2,002.1	24	876.3

[24] This is the amount of proceeds received from the public. The amount that finally goes to the two-stage firms would be significantly less than $3,784.5 million.

Table D Trustworthiness Index of Firm's Headquarter Locations

The Trustworthiness Index is developed by Zhang and Ke (2002) who used cross-regional data to study the trust worthiness of varied provinces and territories in mainland China. Zhang and Ke (2002) surveyed 15000 top managers and calculated the trust rate (the proportion of respondents who voted for their province/territory) for the individual province/territory. They found that the variables including regional diversities of education, marketization of economies, urbanization, population density, and transportation facilities are significantly correlated with the trust rate. Therefore, they built a Trustworthiness Index to include these variables. The Index doesn't include Hong Kong.

Trustworthiness Index Ranking	Province/Territory	# of Two-Stage Firms
1	Shanghai	2
2	Beijing	13
3	Jiangsu	1
4	Guangdong	12
5	Shandong	1
6	Zhejiang	4
7	Tianjin	1
8	Liaoning	2
9	Hubei	1
10	Sichuan	-
11	Fujian	2
12	Yunnan	1
13	Heilongjiang	5
14	Xinjiang	-
15	Shaanxi	8
16	Jilin	1
17	Henan	5
18	Chongqing	-
19	Hebei	1
20	Guangxi	-
21	Anhui	-
24	Hunan	-
25	Gansu	-
26	Jiangxi	-
27	Guizhou	-
30	Hainan	1
	Hong Kong	3
	Unknown	7
	Total	71

Table E Size of Two-Stage Firms

The dollar amount of sales revenue and total assets are in two-stage firm's financial statements in IPO year. They are used as proxies for the size of two-stage firms. Sales revenue is adjusted for returns and refunds.

Year of IPO	**Sales Revenue** ($ mm)		**Total Assets** ($ mm)	
	Mean	Median	Mean	Median
2005	866.3	866.3	668.9	668.9
2006	64.3	64.3	70.0	70.0
2007	84.1	86.6	184.2	165.5
2008	223.9	245.4	686.8	424.1
2009	220.4	95.4	212.3	140.5
2010	135.4	111.9	147.9	135.6
2011	338.7	196.7	110.6	110.1
2005 - 2011	190.7	98.1	212.1	140.1

Table F Shares Buyback and Acquisition of Two-Stage Firms

Shares buyback and acquisition are observed within three years after a two-stage firm's IPO. Shares buyback and acquisition are obtained from Thomson Reuters database; they are also confirmed in the EDGAR database.

Year of IPO	N	Shares Buyback within Three Years after IPO		Acquisition within Three Years after IPO	
		Yes	No	Yes	No
2005	1	1	-	1	-
2006	2	-	2	1	1
2007	6	2	4	3	3
2008	4	2	2	2	2
2009	27	10	17	16	11
2010	27	6	21	10	17
2011	3	-	3	1	2
2012	1	-	1	-	1
Total	71	21	50	34	37

Table G Time Interval from Backdoor listing to IPO and from IPO to Follow-Up Equity Offering

Backdoor listing is the day when a two-stage firm conducts reverse acquisition of a shell company. IPO is the day a two-stage firm conducts initial public equity offering. Follow-up equity offering is the day a two-stage firm issues the first follow-up equity offering.

	Backdoor Listing to IPO	**IPO to Follow-Up Equity Offering**
# of Two-Stage Firms	69	24
Mean (months)	34.0	12.83
Median (months)	33.0	14.07

Table H Gross Proceeds and Market Capitalization of Matching Firms

SIC codes are Standard Industrial Classification codes; information about the firm's code is obtained from the EDGAR database. Gross proceeds are collected from matching firm's IPO prospectuses. Market capitalization is calculated as the product of a firm's closing share price and the total number of shares outstanding on IPO day.

	SIC Code Match			**Gross Proceeds ($ mm)**		**Market Capitalization ($ mm)**	
	1-Digit	2-Digit	3-Digit	Mean	Median	Mean	Median
Two-Stage Firms	-	-	-	28.1	22.7	193.1	158.5
Ctrl_CHN_Proceeds	0	30	41	36.0	31.2	187.1	109.3
Ctrl_CHN_MarketCap	1	31	39	50.8	42.0	203.9	164.4
Ctrl_US_Proceeds	2	46	23	70.9	49.0	249.5	141.8
Ctrl_US_MarketCap	2	46	23	141.2	107.9	418.7	280.9

ESSAY ONE: COST AND MARKET TIMING OF TWO-STAGE STRATEGY

Abstract

U.S. underwriters charge higher IPO underwriting fees than Chinese underwriters. However, the U.S. equity market has significantly lower IPO underpricing than the Chinese equity market. By conducting IPOs in the U.S., two-stage firms pay an underwriting fee that is 1.6% higher than their Chinese domestic peers. However, their IPO underpricing is more than 100% lower. Two-stage firms also have IPO underpricing that is between 1.2 to 10.8% lower than their U.S. peers. The reduction in firm-specific risk during pre-IPO period explains this low IPO underpricing. Moreover, we find supporting evidence for the signaling effect of audit quality on IPO underpricing, and for the signaling effect of IPO underpricing on follow-up equity offering. Our results on IPO timing indicate that two-stage firms conduct IPOs within six months after the equity market turns favorable, but it takes the U.S. conventional IPOs more than a year. Combining these findings, we conclude that for two-stage firms, a two-stage strategy is less costly and more flexible than the conventional IPO process.

Underwriting fees and underpricing are two frequently studied cost elements in the IPO literature. Underwriting fees, or gross spread, is the portion of the IPO proceeds that underwriters retain as fees to compensate for their underwriting service. It is often termed as a direct cost of an IPO. On the other hand, underpricing is termed as the indirect cost of an IPO. It refers to the increase in an IPO firm's share value, from IPO offer price to the first-day closing price. While underwriting fees and underpricing have been studied extensively in the context of conventional IPO processes, only a small number of studies investigated them in the context of a two-stage strategy. This phenomenon emphasizes the importance of this essay. As two-stage firms are already listed publicly before the initial public offering, the level of

information asymmetry associated with the offering would be different from the conventional IPO firms. Therefore, we expect that two-stage firms' underwriting fees and underpricing would be different from conventional IPO firms. In addition, the existing studies on two-stage strategy only provide U.K. and Australian evidence of their respective domestic companies. To our knowledge, there is no evidence on the cost of the two-stage cross border IPOs in the U.S.

In this essay, we investigate and report the underwriting fees and underpricing of two-stage firm IPOs. We compare two-stage firm IPOs with conventional IPOs in the Chinese equity market, as well as the IPOs of U.S. firms. We find that two-stage firms pay 1.6% more in underwriting fees in the U.S. than their domestic peers in China. But the savings on IPO underpricing in the U.S. is more than 100%. Overall, two-stage firm have lower total cost than both Chinese and U.S. conventional IPOs. We argue that the low cost is driven by the two-stage strategy – allowing firms to significantly reduce information asymmetry in pre-IPO period. We also find that two-stage firms time their IPOs in strong equity markets. These results support the capital demand hypothesis and the investor sentiment hypothesis. We believe our study is the first to examine two-stage strategy as an alternative for Chinese firms to conduct IPOs in the U.S. Our findings provide empirical evidence in terms of the cost and timing of two-stage firm IPOs as well.[25]

The rest of this essay is organized as follows: First, we review the related studies and discuss whenever they are applicable. We then develop our hypotheses on the cost and timing of two-

[25] We attempted to extend our sample to include the non-Chinese two-stage firms, but could not find any non – Chinese firms who have used this strategy.

stage firm IPOs. Secondly, we introduce the empirical design and define the variables for this essay. Next, we show our findings and provide discussions regarding the advantages of a two-stage strategy. Lastly, we summarize our findings and results to conclude this essay.

Literature Review and Hypothesis Development

In this section, we review the results from previous studies that are related to two-stage strategies and conventional IPOs. Since two-stage firms are Chinese firms and two of our control samples are the IPOs in the Chinese equity market, we first review the evidence on the Chinese domestic IPOs below.

Underpricing of Chinese Domestic IPOs

Previous studies found that being the home country of two-stage firms, China has an IPO market with a significant degree of underpricing. Table 1.1 summarizes the results in these studies. Ritter (2003) reported that the average underpricing in China was 256% from 1990 to 2000 – the highest of the 38 countries in his study.[26] The implementation of a registration system in 2005 helped reduce IPO underpricing in China, but the underpricing remains very high relative to the U.S. IPO market.[27] Teshima and Suzuki (2008) pointed out that in China, both managers and government have incentives to underprice IPO shares. The government underprices IPOs to encourage investment. If investors leave the stock market, the subsequent IPOs of state-owned enterprises (SOEs) would be jeopardized. As managers of the SOEs are

[26] This is huge underpricing in China is driven by the local political factors; the Chinese government deliberately affected the IPO firms to underprice their shares, so that the government could ensure a smooth and successful privatization.
[27] Please see the discussion on the development of the Chinese domestic equity market in Appendix C.

appointed by the government, they do not have significant ownership in their firms. They underprice their firm's shares in order to avoid being penalized for putting the government's privatization plan in jeopardy. Sun and Fleisher (1997) argued that the small quota system and the low aggregate amount of shares offered to the public result in the high IPO underpricing. Gao (2006)[28] and Xu and Luo (2007)[29] found that Chinese IPOs with reputable underwriters tend to be highly underpriced. However, Huang (2011) reported that because underwriters charge underwriter fees of 1.5 to 3% whether they are prestigious or ordinary, underwriter reputation isn't significantly correlated with IPO underpricing in China.

Many studies investigated the signaling effect of IPO underpricing as well. Li and Hovey (2009) found that the IPOs with higher underpricing tend to have better long-term stock market performance. The finding is consistent with the U.S. evidence in that IPO underpricing signals firm quality (Welch, 1989; Chemmanur, 1993). Su and Fleisher (1997) found that in China, the IPOs with higher underpricing have quicker follow-up equity offerings and raise larger amounts of proceeds. This finding is inconsistent with the evidence in other emerging markets where IPO underpricing signals government's commitment to pro-market privatization policies (Perotti, 1995).

[28] Gao (2006) used the Megginson-Weiss ranking. Megginson-Weiss ranking was developed by Megginson and Weiss (1990), and measures the relevant market share of an underwriter. It is the ratio of the total number of shares underwritten by an underwriter relative to the total share issuance in the IPO market.

[29] Xue and Luo (2007) used "face-changing ratio". Per Xu and Luo (2007) state that an IPO "changes face" in post-IPO if its profit declines by more than 30% annually in two aftermarket years. In China, the CRTC would officially disclose and punish such an IPO underwriter. The face-changing ratio measures the percentage of IPOs an underwriter has ever underwritten that have "changed face."

Studies on Two-Stage Strategy

First and foremost, we have not found any research pertaining to the two-stage firms in North America, nor have we found any non-Chinese foreign firms that use this strategy in the U.S. Brown et al. (2010) provided evidence on the two-stage strategy in Australia. They found that the Australian domestic two-stage firms tend to be less profitable, more in the development stage and larger in total assets. Compared to the Australian conventional IPOs, the Australian two-stage firm IPOs cost less, take longer to complete, and have lower balance sheet liquidity.[30] The mean (median) IPO underpricing for the Australian two-stage firms and conventional IPOs are 25.6% (7.5%) and 23.8% (11%), respectively.

While the Australian evidence provides reference for our study, we notice two main differences between the Australian and Chinese two-stage firms. First, a large number of the Australian two-stage firms in Brown et al. (2010) are in high-tech sector, but our Chinese two-stage firms have wider distribution across different sectors. Secondly, the Australian two-stage firms are domestic to the Australian investment community. But the Chinese two-stage firms are foreign to the U.S. investment community. Many factors such as culture difference, security threats, political uncertainty, inflation rates and the macroeconomic and institutional environment would add difficulty for a foreign firm's valuation. Hymer (1960) has called it "liability of foreignness". Other studies refer it as country risk. The risk could lead to elevated level of information asymmetry, thus a higher level of IPO underpricing. Kadiyala and Subrahmanyam (2002) showed that the average foreign IPO underpricing in the U.S. is 21.5%, higher than the average of 18.8% for the U.S. domestic IPOs. Bell et al. (2008) and Francis et

[30] The mean (median) time interval between backdoor listing and initial public offering in Australia is 184.2 (153) days, longer than the 96.5 (92) days from registration date to offering date for the conventional Australian IPOs.

al. (2008) reported that firms from low economic freedom and segmented markets tend to underprice their shares at an even higher level.

Another relevant study was done by Derrien and Kecskes (2007) who investigated the IPOs of the list-by-introduction firms in the U.K.[31] Derrien and Kecskes (2007) argued that conducting IPO after listing by introduction is a two-stage strategy and is a natural solution to the costly uncertainty for private firms intending to raise public capital. Their results show that because list-by-introduction firms are able to reduce valuation uncertainty before raising public capital, their IPO underpricing was significantly less than the U.K. conventional IPOs.[32] The average total direct and indirect cost of IPO is £1.988[33] million for the list-by-introduction firms, less than £2.76[34] million for the comparable conventional IPOs. In addition, the list-by-introduction firm IPOs react more quickly to the change in equity market condition. Derrien and Kecskes (2007) found that when the conventional IPO wave starts, the list-by-introduction firms also start to issue public equities. But because the list-by-introduction firms are already on the London Stock Exchange, they can take advantage of the favourable market conditions faster than the conventional IPO firms.

[31] List-by-introduction firms introduce themselves onto the London Stock Exchange.

[32] After controlling the offering size and market capitalization, the underpricing for these list-by-introduction firms would have been 42%.

[33] For two-stage firms, the mean introduction fee and offering fee are £0.748 million and £0.329 million; therefore, the direct cost is £1.077 million (0.748 + 0.329 = 1.077). The £0.99 million indirect cost includes£0.7 million due to an average of 11.9% underpricing (5.88 * 11.9% = 0.7 million) and £0.211 million due to the ownership dilution prior to the public offering. The sum of direct and indirect costs is £1.988 million (1.077+0.911=1.988).

[34] For the conventional IPOs, the direct cost is the £0.288 million IPO fee (5.88*4.9%=0.288); the indirect cost is £2.47 million due to underpricing (5.882*42%=2.47). The sum of the direct and indirect cost is £2.758 million (0.288+2.47=2.758).

We argue that the list-by-introduction firms in the U.K. and the two-stage firms in our study have similarities. Both of them are listed on stock exchanges prior to IPO. Their continuous disclosure of accounting data helps disseminate firm-specific information to the public. More importantly, they have stock market trading history in pre-IPO period. This is the information on market valuation that the conventional IPO firms don't have. We also note that two-stage firms and list-by-introduction firms differ in several aspects. First, we have shown in the previous section that the average market capitalization on IPO day is $193.1 million for our sample of two-stage firms. This is significantly larger than the average of $60.3 million for the list-by-introduction firms reported by Derrien and Kesckes (2007).[35] The difference in firm size indicates different risk profiles. Secondly, public listing processes are different: two-stage firms use backdoor listing, but the list-by-introduction firms use application. A stock exchange can act as a safeguard by selecting good quality list-by-introduction firms; but it cannot select two-stage firms.

Impact of Market Condition on IPO Timing

Brau and Fawcett (2004) reported that firms' chief financial officers considered market condition as the most important factor affecting IPO timing. Lowry (2003) listed three hypotheses to explain the impact of market condition. First, the capital demand hypothesis asserts that during the period of high economic growth, firms have more opportunities to expand and have more needs of capital to finance their expansion. They are likely to conduct IPO. The empirical evidence in Derrien and Kesckes (2009) also showed that economic

[35] In Derrien and Kesckes (2007), the average market capitalization of list-by-introduction firms on IPO day is 30.0 million British pounds (GBP). Then we use an average exchange rate of 2.01 USD/GBP in 2007 to translate the market capitalization into USD, £30.0 million × 2.01 USD/GBP = $60.3 million.

fundamentals can explain 40% of the variation in terms of IPO timing. We argue that since equity market condition is a proxy of the development in economic fundamentals, it should be positively correlated with IPO timing, too. In the case of two-stage firms, because their operating businesses are in China, we expect that the economic fundamentals in China should have impact on two-stage firms' IPO timing. Our expectation is based on three reasons: first of all, as is suggested by the capital demand hypothesis, strong economic fundamentals in China mean that two-stage firms need more capital to finance their growth, it is more urgent for them to raise capital. Second of all, strong economic fundamentals lead to lower country risk. This could reduce the information asymmetry between two-stage firms and the U.S. investors; it leads to a reduced level of IPO underpricing, thus a reduced IPO cost. Lastly, when economic fundamentals are strong in China, the U.S. investors may have higher sentiment towards China, thus higher valuation on two-stage firms' IPO. This would further reduce the IPO cost for two-stage firms. As we use broad stock market performance as the proxy of economic fundamentals, we expect that the broad stock market performance in China should be positively correlated with two-stage firms' IPO timing.

The investor sentiment hypothesis suggests that firms tend to conduct IPOs during the period when investors are over optimistic. The over optimism would result in the overvaluation of IPO firms, thus reduce the cost of IPO. We argue that because the over optimism tends to occur in strong stock market, firms would take advantage of the overvaluation and issue equities in strong stock market. In our study, as two-stage firms are listed in the U.S., we expect that two-stage firms tend to conduct IPOs when the broad stock market in the U.S. has strong performance.

The third hypothesis is related to information asymmetry. Lowry (2003) argued that firms would conduct IPOs only when the information asymmetry reduces to a level where the present value of IPO proceeds is higher than the IPO cost. In our study, we use firm-specific risk as a proxy for information asymmetry. We expect to detect a downward trend in firm-specific risk, thus a decreasing level of information asymmetry prior to two-stage firms' IPOs.

As two-stage firms conduct IPOs in a foreign country, the currency market condition would have impact on IPO timing as well. A weakening Chinese RMB relative to the U.S. dollar would reduce investment cost for the U.S. investors; thereby increase the demand for two-stage firm shares. However, because two-stage firms' financial reports need to be translated into U.S. dollars, continuous weakening of Chinese RMB would have a negative impact. Bruner et al. (2004) found that foreign firms tend to conduct IPOs in the U.S. when exchange rate movements are relatively stable in pre-IPO period.[36] In our study period, China's exchange rate policy allows a band of up to 1% appreciation/depreciation against the U.S. dollar.[37] The policy results in a stable currency conditions, encourages foreign investments and makes two-stage firm IPOs more attractive to the U.S. investors. But because this study period doesn't differentiate stable and volatile currency conditions, we don't test any hypothesis related to the impact of currency market condition on IPO timing.[38]

[36] The annualized standard deviation of currency returns is 20% during the two-month period prior to a foreign IPO in the U.S.
[37] The band in China's exchange rate policy is +/- 2% in March 2014, +/- 1% in April 2012, +/- 0.5% in May 2007, +/- 0.3% in July 2005, and fixed exchange rate prior to July 2005.
[38] In a robustness test, we also find that currency market return is not significantly correlated with two-stage firms' IPO timing. The results are available upon request.

Hypotheses

Based on the discussions above we develop our key hypotheses in this section. Our first hypothesis is regarding two-stage firms' firm-specific risk in pre-IPO period. We argue that two-stage firms disseminate accounting information to the public in pre-IPO period. More importantly, they have trading history prior to IPO which contains the information about two-stage firms' valuation. This should help reduce valuation uncertainty, therefore reduce the information asymmetry associated with two-stage firms' IPO. The information asymmetry hypothesis also suggests that firms tend to issue IPOs when their information asymmetry reduces to a level when the present value of IPO proceeds is higher than the IPO cost. As firm-specific risk is a proxy for information asymmetry, we expect that:

Hypothesis 1.1 *Firm-specific risk of two-stage firms follows a downward trend prior to IPO.*

As the conventional IPO firms don't have trading history in pre-IPO period, there is a higher uncertainty in terms of valuating them. Investors would require deeper IPO underpricing to compensate for the higher valuation uncertainty. Therefore, the conventional IPOs would be more underpriced than two-stage firm IPOs. In other words, we expect that:

Hypothesis 1.2 *Two-stage firm IPOs are less underpriced than the control samples of conventional IPOs.*

We expect that two-stage firms' IPO underpricing has signaling effect on follow-up equity offering. In particular, we argue that the two-stage firms that plan to issue follow-up equity offerings may deliberately underprice their IPO shares to attract investors in their follow-up offerings. This is for two reasons. First, two-stage firms come to the U.S. because they cannot access the Chinese capital market. Since they are young and in an early stage of development, they would have continuous needs for capital. They are likely to issue follow-up equity offering after IPO. Secondly, although underpricing IPO shares at a deeper level would increase IPO costs, we have shown in the literature review section that the IPO underpricing in the U.S. is significantly lower than in China. Therefore, the increasing cost due to the deliberate underpricing in the U.S. may be within two-stage firms' tolerance. We argue that this extra underpricing is the premium that two-stage firms pay in IPO to ensure their future success in follow-up equity offerings. Overall, we expect that:

Hypothesis 1.3 *Higher level of underpricing in two-stage firm IPO signals higher probability of follow-up equity offering.*

Furthermore, we argue that longer time intervals between listing and IPO would allow two-stage firms to have a longer trading history during the pre-IPO period. This would allow investors to collect more information on a two-stage firm's valuation. This should further reduce information asymmetry. As IPO underpricing tends to correlate positively with information asymmetry, we expect that:

Hypothesis 1.4 *The time interval between listing and IPO negatively correlates with IPO underpricing.*

The capital demand hypothesis suggests that the growth in a country's economic fundamentals would provide opportunities for firms to expand rapidly. Firms would then have an increasing need for capital, increasing the likelihood of it conducting IPOs. Because two-stage firms' operating businesses are in China, we expect that economic growth in China is positively correlated with two-stage firms' IPO timing. In addition, as the broad stock market performance tends to be positively correlated with the economic growth, we expect that:

Hypothesis 1.5 *Two-stage firms tend to conduct IPOs when the Chinese stock market has strong performance.*

As two-stage firms raise capital in the U.S., the sentiment in the U.S. capital market would have an impact on two-stage firms' IPO timing. The investor sentiment hypothesis suggests that overly optimistic investors are likely to overvalue firms. Since this optimism tends to occur during a strong stock market, firms are more likely to issue IPOs to take advantage of the overvaluation and reduce IPO costs. We expect that:

Hypothesis 1.6 *Two-stage firms tend to conduct IPOs when the U.S. stock market has strong performance.*

Empirical Design and Variable Definitions

In the section below, we discuss the methodologies that we use to test our hypothesis. As we use many firm specific variables in testing our hypotheses, we also provide the definitions for these variables.

Measurement of Firm-Specific Risk

We use Campbell et al. (2001) variance decomposition to calculate firm-specific risk. They measured the risk with the variance of a firm's daily stock returns:

$$Var(R_{jit}) = \frac{\sum_{t=1}^{N}(R_{jit} - \overline{R_{jit}})^2}{N-1} = \beta_{im}^2 Var(R_{mt}) + \beta_{ji}^2 Var(\bar{\epsilon}_{jt}) + Var(\bar{\eta}_{jit}) \quad (1.1)$$

where R_{jit} is the return of firm *i* in industry *j* during time *t*; R_{mt} is the market return during time *t*; β_{im} is the beta of firm *i* with respect to market return; β_{ji} is the beta of firm *i* with respect to industry *j*; $Var(R_{mt})$ is the variance of market returns; $Var(\bar{\epsilon}_{jt})$ is the specific variance of industry *j*, calculated as $Var(R_{jt})$-$\beta_{jt}^2 Var(R_{mt})$, where R_{jt} is the return of industry *j* during time *t*; β_{jt} is the beta of industry *j* with respect to market return. $Var(\bar{\eta}_{jit})$ is the firm-specific variance of firm *i*.

In the equation, the first component $\beta_{im}^2 Var(R_{mt})$ represents a firm's volatility caused by market factors, the second component $\beta_{ji}^2 Var(\bar{\epsilon}_{jt})$ represents the volatility caused by industry

factors, and the third component $Var(\eta_{jit})$ represents the volatility caused by firm-specific characteristics.

We extend Campbell et al. (2001) by adding a currency variance component to the equation. As we have discussed in the previous section, China's exchange rate policy has a band of +/-1% change in currency value relative to the U.S. dollar. Figure 1.1 shows that most of the monthly currency returns during our study period is within the +/-1% range. However, there are four occasions where the returns are below -1%. These four occasions are not significant enough to affect our conclusion on the IPO timing of two-stage firms. But they may have a significant impact on our calculation of firm-specific risk. Therefore, we include the currency variance component to minimize the impact of these four occasions. Combining Campbell et al. (2001) with our modification, we use two steps to calculate firm-specific risk. First, we conduction linear regression with the dependent variable, namely, a two stage firm's stock market returns, and three independent variables: (a) general stock market return, (b) industry sector return and (c) currency return. The regression is as follows:

$$R_{jit} = \alpha_{it} + \beta_{im} R_{mt} + \beta_{jt} R_{jt} + \beta_{ct} R_{ct} + \tilde{\epsilon}_{ji} \quad (1.2)$$

where β_{im} is the beta of two-stage firm *i* with respect to Shanghai Stock Exchange A Share Index; R_{mt} is the return of Shanghai Stock Exchange A Share Index; β_{jt} is the beta of two-stage firm *i* with respect to Shanghai Stock Exchange sector index; R_{jt} is the return of Shanghai Stock Exchange sector index; β_{ct} is the beta of two-stage firm *i* with respect to

value of Chinese RMB relative to the U.S. dollar; R_{ct} is the return of Chinese RMB relative to U.S. dollar over time *t*.

The firm-specific risk is calculated as the variance of, or $Var(\tilde{\epsilon}_{jit})$. We then report firm-specific risk for seven time intervals during a pre-IPO period: (a) (-180 days, -150 days), (b) (-150days, -120 days), (c) (-120 days, -90 days), (d) (-90 days, -60 days), (e) (-60 days, -30 days), (f) (-30 days, -5 days), and (g) (-5 days, -1 days). We choose these seven time intervals for the following reason. Stock variance may change significantly when a two-stage firm approaches its IPO stage, therefore we use the shorter intervals (f) and (g) to capture the change in variance. For the period prior to the intervals (f) and (g), we simply calculate the 30-day variance. As we extend the pre-IPO period, we find a decreasing number of observations. Many two-stage firms don't have a very long pre-IPO history. Therefore, we only investigate the period up to 180 days prior to their IPO. In such a way, we could ensure that the number of observations is sufficient to provide meaningful statistical reference.

We then measure the risk reduction by calculating the difference in variance for the seven time intervals:

$$Risk\ Reduction\ = Var(\tilde{\epsilon}_{interval\ 1}) - Var(\tilde{\epsilon}_{interval\ 2}) \quad (1.3)$$

For the purposes of robustness testing, we also use the Russell 2000 Index as a benchmark to calculate firm-specific risk. The firm-specific risk relative to the Russell 2000 Index can serve as an indicator of the diversification benefit that two-stage firms offer to the U.S. investors.

It should be noted that because two-stage firms have a trading history prior to IPO, we are able to calculate their firm-specific risk during the pre-IPO period. Our objective is to investigate changes in the firm-specific risk as two-stage firms approach to their IPO. A decreasing (increasing) risk would indicate a reduced (elevated) level of information asymmetry.

Measurement of Underpricing

As is discussed in the previous section, we use initial return as a proxy for IPO underpricing. Initial return is the difference between issue price and offer day closing price, scaled by offer day closing price. This is the same method to measure the underpricing of conventional IPOs. However, we notice that the trading history prior to IPO makes our sample two-stage firms different from the conventional IPOs. By using initial return to measure two-stage firms' IPO underpricing, we are implicitly assuming that on the IPO day, IPO is the only event affecting the change in a two-stage firm's stock price. There is no new information released to the public about a firm's pre-IPO characteristics (such as operating business). In other words, the closing price on IPO day only reflects the information about a two-stage firm's IPO.

Variable Definitions

With the research models discussed in the previous sections, we define our variables that are related to these models. The variable definitions are listed in Table 1.2. In Table 1.3, we provide pair-wise Pearson correlations among a selection of variables. When we use the Shanghai Stock Exchange A Share Index and Russell 2000 Index as benchmark indexes, we find a significant correlation coefficient (0.996) for firm-specific risk reductions

(*RiskReduction_SH* and *RiskReduction_RU*). Other pair-wise correlation coefficients are insignificant, indicating that risk reduction (*RiskReduction_SH* and *RiskReduction_RU*), time interval between listing and IPO (*Time*), audit quality (*Audit*) and underwriter reputation (*Underwriter*) contain different information about two-stage firms' IPO.

Empirical Results

In this section, we report the results of our hypothesis testing. We provide discussions on our findings as well.

Firm-Specific Risk

Table 1.4 shows the two-stage firms' firm-specific risk up to 180 days prior to IPO. The average risk relative to Shanghai Stock Exchange A Share Index (Russell 2000 Index) drops from 6.66% (6.26%) from 150 to 180 days prior to IPO, to 4.53% (4.34%) from 30 to 60 days prior to IPO. In the paired two-sample t test, we show that the average risk reduction during the two time intervals is 2.12% (1.91%) and is statistically significant. The findings indicate that two-stage firms' firm-specific risk follows a downward trend during the pre-IPO period. This evidence supports our Hypothesis 1.1 in that the trading history and the continuous dissemination of accounting information to the public during the pre-IPO period help reduce information asymmetry. Another finding is that the average firm-specific risk increases to 5.04% (4.81%) from 1 to 30 days prior to IPO, then decreases to 4.60% (4.48%) from 1 to 5 day prior to IPO. We argue that when two-stage firms announce their intention to conduct IPO, the uncertainty about the IPO leads to an elevated firm-specific risk. But as more information

about the IPO is released to the market, firm-specific risk declines. We also notice that the average firm-specific risk is higher relative to Shanghai Stock Exchange A Share Index (*Risk_SH*) than Russell 2000 Index (*Risk_RU*). This is likely driven by the size effect. As Russell 2000 Index is comprised of small-cap firms, it is able to explain more size effect in two-stage firms' stock return volatility than Shanghai Stock Exchange A Share Index.[39] Therefore, the residual risk, or firm-specific risk relative to the Russell 2000 Index, is lower.

Cost of IPO

In Table 1.5, the average underwriting fee of our two U.S. control samples are 7.04% and 6.85%, respectively. This is consistent with the 7% solution in the IPO literature. Chen and Ritter (2000) pointed out that U.S. underwriters are compensated by both underwriting fees and IPO underpricing. If they charge lower fees, they may be compensated with higher IPO underpricing – raising the overall cost to the IPO firms. The average underwriting fee of the two Chinese control samples (*Ctrl_CHN_Proceeds* and *Ctrl_CHN_MarketCap*) are 4.58% and 4.47%, which are approximately 2.5% lower than the U.S. control samples. Our two-stage firms have an average underwriting fee of 6.15%. This is significantly lower than the U.S. control samples (*Ctrl_US_Proceeds* and *Ctrl_US_MarketCap*), but significantly higher than the Chinese control samples. Overall, we find that a two-stage strategy can reduce the direct IPO cost by approximately 0.9% in the U.S. However, issuing IPOs in the U.S. has 2.5% more direct costs than in China. However this extra direct cost is more than offset by the savings on the indirect cost, or IPO underpricing. The average IPO underpricing for two-stage firms is

[39] The average market capitalization of Shanghai Exchange Index constituent companies is $2.32 billion in December 2010. The average market capitalization of Russell 2000 Index constituent companies is $1.26 billion in March 2015.

5.04%. This is significantly lower than the averages of 138.11% and 109.11% for the two Chinese control samples.[40] We find that the average IPO underpricing for two-stage firms is also lower than the two U.S. control samples. Particularly, the result is statistically significant when we compare two-stage firms with the market capitalization matching U.S. control sample (*Ctrl_US_MarketCap*). Overall, the evidence in Table 1.5 supports our Hypothesis 1.2 in that two-stage firm IPOs are less underpriced that the control samples of conventional IPOs.

Table 1.6 shows our testing on the factors related to underwriting fees and IPO underpricing. In Panel A, we test the signaling hypothesis on follow-up equity offering within three years of IPO. We find that for the 47 two-stage firms with follow-up equity offerings, the average IPO underpricing is 2.45% lower than the two-stage firms without follow-up equity offerings.[41] This finding supports our Hypothesis 1.3 in that a higher level of IPO underpricing signals a higher probability of follow-up equity offering. We argue that two-stage firms requiring follow-up equities may be underpricing their shares so that they could attract investors in follow-up equity offerings. We also find that the two-stage firms with follow-up equity offerings paid an average underwriting fee of 5.62%. This is significantly less than the average of 6.42% for the two-stage firms without follow-up equity offerings. We argue that underwriters are likely to recognize the signaling effect of IPO underpricing, causing them to charge lower IPO underwriting fees to assist two-stage firms in follow-up equity offerings.

[40] The SOE IPOs in China tend to be affected by deliberate political motives. But as we avoid using the SOE IPOs in our control samples, we minimize the impact of the political factors, so that our results on the control samples are less biased.
[41] The insignificant result is likely driven by the small sample size.

In Panel B and Panel C, we test the effect of firm-specific risk reduction during the pre-IPO period. The risk is calculated relative to two benchmark indexes: Shanghai Stock Exchange A Share Index and Russell 2000 Index. With the median risk reduction as a threshold, we divide our sample into two groups (High and Low). We find the results are very consistent under both of the benchmark indexes. The difference in underwriting fees between the two groups of firms is only one basis point, indicating that risk reduction doesn't have a significant impact on IPO underwriting fees. But the difference in IPO underpricing ranges from 3.31% in Panel B to 3.66% in Panel C, indicating that higher risk reduction during the pre-IPO period is associated with lower IPO underpricing. Once again, this is supporting evidence for our argument that a two-stage strategy can help reduce information asymmetry during the pre-IPO period, thus reducing the level of IPO underpricing. It is consistent with our findings in Table 1.4 and supports our Hypothesis 1.1.

In Panel D, we divide our sample into two groups based on the time interval between listing and IPO. As the time horizon for annual reporting is one year, we simply use one year as a threshold. We find that the two-stage firms with less than one year of public listing history are 2.32% higher in underwriting fees and 1.71% higher in IPO underpricing. It indicates that a shorter time interval between listing and IPO is associated with a higher IPO cost. This finding supports our Hypothesis 1.4 in that the time interval between listing and IPO negatively correlates with IPO underpricing. We argue that two-stage firms with short public listing histories are unlikely to disseminate information as much as the firms with long histories. The smaller amount of information leads to higher information asymmetry, and therefore higher IPO underpricing. In addition, the two-stage firms with short trading histories have to pay

higher underwriting fees to compensate underwriters for their extra effort, including the collection of information for financial reporting and aftermarket coverage. This leads to higher underwriting fee.

In Panel E, we measure the two-stage firms' audit quality with the four-tier framework employed by Ang et al. (2014). A score above 2.5 indicates high quality. Our result shows 50 two-stage firms use high quality auditors. There are two hypotheses regarding the impact of audit quality on IPO underpricing. On the one hand, the information asymmetry hypothesis states that high quality auditing can reduce ex ante uncertainty about an IPO firm, leading to a reduced level of information asymmetry and IPO underpricing. On the other hand, the signaling hypothesis suggests that good firms have favorable information. They are willing to pay a premium for high quality audits that can be used as a means of releasing favorable information to the public. Bad firms are reluctant to hire high quality auditors because the disclosed information would be unfavourable. Therefore, the quality of the auditor reflects the quality of the firm. Holding IPO offering price constant, investors are willing to give higher valuation to firms with high quality auditors. This results in higher IPO underpricing. In our study, the two-stage firm IPOs with high quality audits are 1.27% more underpriced than those with low quality audits. But the result is not statistically significant. It doesn't support either the information asymmetry hypothesis or the signaling hypothesis.

In Panel F, we test the impact of underwriter reputation. The underwriter reputation scores are collected from Jay Ritter's database. The scale is from one to nine, with one representing the lowest reputation and nine representing the highest reputation. We use five as a threshold and

divide our sample into two groups. We find that only sixteen two-stage firms use reputable underwriters. On average, their underwriting fee is 0.19% lower than the two-stage firms without reputable underwriters. But the difference is not statistically significant, indicating that both the reputable and non-reputable underwriters charge a similar underwriting fee. In addition, the two-stage firms with reputable underwriters are 1.43% lower in IPO underpricing. But once again, the difference is not statistically significant. This result partially supports the underwriter certification hypothesis. Because the reputable underwriters serve as quality controls that justify the IPO, they help reduce IPO underpricing.

In Table 1.7, we conduct a multivariate analysis with linear regression models. Model A and Model B use the underwriting fee as the dependent variable. When we include all four independent variables in Model A, none of them have a statistically significant regression coefficient. We argue that this may be due to the small sample size. We only have 43 observations available for this model, therefore the rule of 15:1 is violated and we are less likely to find any statistically significant results.[42] When we exclude risk reduction (*RiskReduction_RU*) from the regression in Model B, the number of available observations increases to 62. We find that the regression coefficient for time interval between listing and IPO (*Time*) is -0.435 and is statistically significant. It indicates that the length of a two-stage firm's public listing history during the pre-IPO period is negatively correlated with the underwriting fee. This is consistent with our previous argument in that two-stage firms with shorter public listing histories have higher information asymmetry. They need to pay higher underwriting fees to compensate their underwriters for their extra effort in terms of market

[42] A traditional rule for regression is to have at least 15 observations for each independent variable. This is often referred as the rule of 15:1 in regression models.

making and research coverage. In Model C and Model D, we use IPO underpricing as the dependent variable. Once again, as the rule of 15:1 is violated in Model C, we cannot find any significant regression coefficient. When we exclude the time interval (*Time*) and underwriter reputation (*Underwriter*) in Model D, we find a significantly negative regression coefficient for risk reduction (*RiskReduction_RU*). It indicates that higher risk reduction during the pre-IPO period is associated with lower IPO underpricing. This evidence is consistent with the findings in Table 1.4. It supports our Hypothesis 1.1 in that the pre-IPO public listing history enables two-stage firms to reduce information asymmetry, leading to a reduced level of IPO underpricing.

IPO Timing

In Table 1.8, we investigate the timing of two-stage firm IPOs and four control samples of conventional IPOs. We report a three-month cumulative return on benchmark indexes during four time intervals prior to IPO. In Panel A, we compare two-stage firms with the two Chinese control samples. The benchmark index is Shanghai Stock Exchange A Share Index. We find that Chinese conventional IPOs show very weak timing effect. The only significantly positive benchmark index return occurs for the market-capitalization matching firms (*Ctrl_CHN_MarketCap*) from four to six months prior to IPO. For the gross proceeds matching firms (*Ctrl_CHN_Proceeds*), benchmark index returns are not significantly different from zero for all the four pre-IPO time intervals. The finding is inconsistent with the capital demand hypothesis. We argue that this is driven by the specific IPO process in China. Chinese domestic firms need to obtain the government's approval on their application for IPO. As there is an uncertainty about whether and when the application is approved, it is almost impossible

for the Chinese domestic firms to time their IPOs. On the other hand, two-stage firms show significantly positive timing effect. The three-month cumulative returns on benchmark index range from 4.19% to 7.87% in the pre-IPO time intervals and are statistically significant. The result supports the capital demand hypothesis and our hypothesis 1.5 because two-stage firms tend to conduct IPOs when the Chinese stock market performs well. It also indicates that by conducting IPOs in the U.S., two-stage firms are more flexible in terms of IPO timing. This represents a significant advantage over the Chinese domestic firms, who are subject to the local government's policy on IPO processes.

In Panel B of Table 1.8, we use the Russell 2000 Index as a benchmark index and compare two-stage firms with the U.S. conventional IPOs. We find that the U.S. firms also tend to time their IPOs in a strong stock market. Benchmark index returns for both gross proceeds matching firms (*Ctrl_US_Proceeds*) and market capitalization matching firms (*Ctrl_US_MarketCap*) are significantly positive for the four pre-IPO time intervals. For two-stage firms, benchmark index returns are significantly positive for two pre-IPO time intervals: 7.97% from one to three months prior to IPO and 5.16% from four to six months prior to IPO. This finding supports the investor sentiment hypothesis. Another finding is that for two-stage firms, benchmark index returns from seven to nine months prior to IPO is insignificantly different from zero. The return is even significantly negative from 10 to 12 months prior to IPO. This result indicates that two-stage firms react quickly to the change in stock market conditions. They conduct IPOs within six months after the stock market has performed well. It is shorter comparing to our sample U.S. firms who conduct conventional IPOs after a prolonged period (least a year) of strong stock market performance. Overall, the results in Panel B support our

hypothesis 1.6 in that two-stage firms tend to conduct IPOs when the U.S. stock market performs well.

Conclusions

In this essay, we investigate and compare the cost of an IPO between two-stage firms and conventional IPO firms. We find significant reduction in firm-specific risk for two-stage firms during the pre-IPO period. We claim that this risk reduction enables two-stage firms to have lower IPO underpricing, thus a lower total cost than conventional IPOs. We argue that because a two-stage strategy enables investors to collect more information during the pre-IPO period, it reduces the valuation uncertainty about IPO, resulting in a reduced level of IPO underpricing. In addition, our tests on signaling hypotheses indicate that IPO underpricing signals the probability of follow-up equity offering. We also find supporting evidence for the capital demand hypothesis and the investor sentiment hypothesis, indicating that two-stage firms conduct IPOs when the Chinese and U.S. stock markets perform well. More importantly, we find that two-stage firms conduct IPOs within six months after the market conditions turn favorable, however the U.S. conventional IPOs tend to wait for at least a year. Overall, our findings provide evidence for the academic discussions on the two puzzles in the IPO literature, namely, IPO underpricing and hot issue market as it relates to the two-stage firms. The results of our study show that compared to the conventional IPO process, a two-stage strategy is less costly and more flexible independent of control samples used.

We also notice the limitations of our study. First of all, we doubt that the buyers of two-stage firm shares are the U.S. investors interested in China and are willing to take the extra amount of risk associated with the small and young Chinese firms. However, the buyers could also be the Chinese investors who are willing to invest in two-stage firms, but wouldn't be able to access to these firms through their domestic equity market. In our study, as we focus on the cost and timing of IPO, we don't answer these questions. They deserve further research. Second of all, our entire sample consists of only Chinese firms. Therefore, our conclusions on the cost and timing of the two-stage strategy in the U.S. might be subject to our unique sample. The Australian and U.K. studies have already shown that two-stage strategies could be country-specific. There is possibility that within a country, the strategy could have different impact on foreign firms from different countries. As we don't find any firms from other countries using two-stage strategy in the U.S., we couldn't provide any evidence on this argument. Once again, it deserves further research.

Table 1.1 Summary on IPO Underpricing in China

IPO underpricing is calculated as first-day return which is the difference between IPO price and first-day closing price, divided by first-day closing price. The papers are collected from varied academic journals as well as the Social Science Research Network (SSRN).

Author(s)	Period	Sample Size	Underpricing
Mok and Hui (1998)	1990 - 1993	101	462%
Datar and Mao (1998)	1990 - 1996	226	388%
Ritter (2003)	1990 - 2000	n/a	256.9%
Chen and Gao (2000)	1992 - 1996	565	335%
Lui and Li (2001)	1991 - 1999	781	142%
Zhou and Zhou (2009)	1991 - 2005	1380	238%
Chan et al. (2001)	1993 - 1998	540	178%
Chi and Padgett (2002)	1996 - 2000	668	129%
Han and Chen (2001)	1997 - 1999	379	135%
Li and Hovey (2009)	1999 - 2001	311	132.8%
Ti (2003)	1999 - 2002	354	135%
Huang (2011)	2000 - 2011	1256	43.13%
Su and Bangassa (2011)	2001 - 2006	391	82.73%
Teshima and Suzuki (2008)	2004 - 2005	50	48.6%
Varadzhakov (2009)	2004 - 2008	378	116%

Figure 1.1 Frequency of Monthly Currency Returns

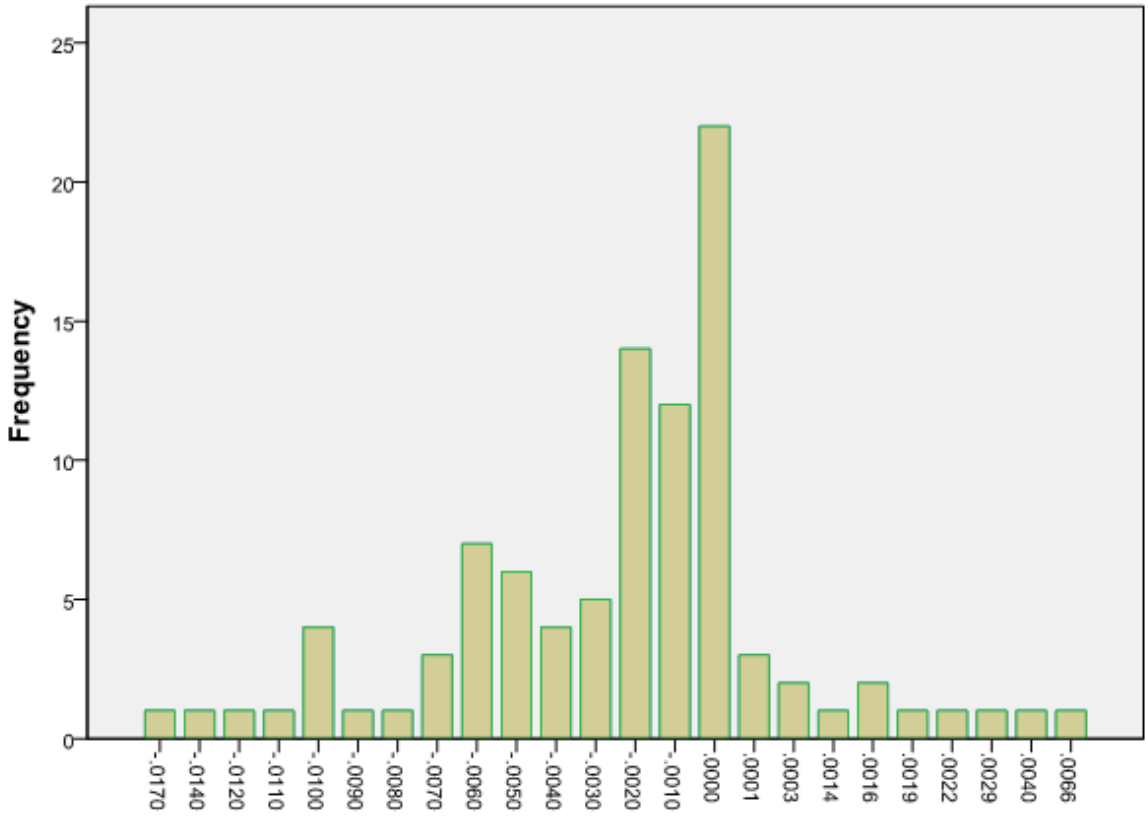

Table 1.2 Definitions of Variables

Variable	Name	Description	Data Source
Audit	Audit Quality	We use the size of an audit firm as a proxy for audit quality. This variable is measured with the four-tier framework in Ang et al. (2014).	LexisNexis; www.vault.com;
Ctrl_CHN_ MarketCap	Control Sample of Chinese Domestic IPOs - Market Capitalization Matching	This control sample of Chinese conventional IPOs matches the two-stage firm sample with two-digit SIC code and market capitalization on IPO day.	Bloomberg
Ctrl_CHN_P roceeds	Control Sample of Chinese Domestic IPOs - Gross Proceeds Matching	This control sample of Chinese conventional IPOs matches the two-stage firm sample with two-digit SIC code and IPO gross proceeds.	Bloomberg
Ctrl_US_Ma rketCap	Control Sample of U.S. Domestic IPOs - Market Capitalization Matching	This control sample of U.S. conventional IPOs matches the two-stage firm sample with two-digit SIC code and market capitalization on IPO day.	Bloomberg
Ctrl_US_Pro ceeds	Control Sample of U.S. Domestic IPOs - Gross Proceeds Matching	This control sample of U.S. conventional IPOs matches the two-stage firm sample with two-digit SIC code and IPO gross proceeds.	Bloomberg
Risk_RU	Firm-Specific Risk relative to Russell 2000 Index	The idiosyncratic risk of a two-stage firm after adjusting for general stock market risk, industry risk, and currency risk. The benchmark index is Russell 2000 Index.	Capital IQ; Bloomberg
Risk_SH	Firm-Specific Risk relative to Shanghai Index	The idiosyncratic risk of a two-stage firm after adjustment for general stock market risk, industry risk, and currency risk. The benchmark index is Shanghai Stock Exchange A Share Index.	Capital IQ; Bloomberg

Table 1.2 Definitions of Variables (Cont'd)

Variable	Name	Description	Data Source
RiskReduction_RU	Firm-Specific Risk Reduction relative to Shanghai Stock Exchange A Share Index	The variable measures the difference in firm-specific risk for the two periods from 150 to 180 days prior to IPO and from 30 to 60 days prior to IPO. The benchmark index is Russell 2000 Index.	Capital IQ; Thomson Reuters
RiskReduction_SH	Firm-Specific Risk Reduction relative to Russell 2000 Index	The variable measures the difference in firm-specific risk for the two periods from 150 to 180 days prior to IPO and from 30 to 60 days prior to IPO. The benchmark index is Shanghai Stock Exchange A Share Index.	Capital IQ; Thomson Reuters
Time	Time Interval between Listing and IPO	The number of months between a two-stage firm's backdoor listing and IPO.	LexisNexis
Underwriter	Underwriter Reputation	This is an ordinal variable; it uses a scale from one to nine to measure the ranking or reputation of IPO underwriter. One represents lowest reputation; nine represents highest reputation. The rankings are obtained from Jay Ritter's database.	Jay Ritter's website (https://site.warrington.ufl.edu/ritter/ipo-data/)

Table 1.3 Mean, Standard Deviation and Correlation

Mean, standard deviation and Pearson correlation among seven variables are reported in this table. *RiskReduction_SH* measures the difference in firm-specific risk for the two periods from 150 to 180 days prior to IPO and from 30 to 60 days prior to IPO; the benchmark index is Shanghai Stock Exchange A Share Index. *RiskReduction_RU* measures the difference in firm-specific risk for the two periods from 150 to 180 days prior to IPO and from 30 to 60 days prior to IPO; the benchmark index is Russell 2000 Index. *Time* is the number of months between a two-stage firm's backdoor listing and IPO. *Audit* is audit quality measured with the four-tier framework in Ang et al. (2014).*Underwriter* is an ordinal variable; it uses a scale from one to nine to measure the ranking or reputation of IPO underwriter. One represents lowest reputation; nine represents highest reputation. The rankings are obtained from Jay Ritter's database.

	Mean	**STD**		**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
(1) *RiskReduction_SH*	2.12%	7.28%	Correlation	1				
			p - value					
(2) *RiskReduction_RU*	1.92%	7.20%	Correlation	0.996	1			
			p - value	0.000***				
(3) *Time*	34.04	19.53	Correlation	-0.103	-0.102	1		
			p - value	0.483	0.485			
(4) *Audit*	2.67	0.68	Correlation	-0.073	-0.082	-0.193	1	
			p - value	0.615	0.569	0.118		
(5) *Underwriter*	4.05	1.84	Correlation	0.007	-0.006	-0.117	-0.161	1
			p - value	0.965	0.966	0.352	0.199	

*** significant at 1%, ** significant at 5%, * significant at 10%.

Table 1.4 Firm-Specific Risk in Pre-IPO Period

Firm-specific risk is the standard deviation of daily stock returns controlled for market index, industry sector index and currency impact. *Risk_SH* is the firm-specific risk relative to Shanghai Stock Exchange A Share Index. *Risk_RU* is the firm-specific risk relative to Russell 2000 Index.

Pre-IPO Time Period (days)	*Risk_SH*		*Risk_RU*	
	mean	p-value	mean	p-value
(1) (-180, -150)	6.66%	0.000***	6.26%	0.000***
(2) (-150, -120)	5.28%	0.000***	4.79%	0.000***
(3) (-120, -90)	5.60%	0.000***	5.42%	0.000***
(4) (-90, -60)	5.07%	0.000***	4.71%	0.000***
(5) (-60, -30)	4.53%	0.000***	4.34%	0.000***
(6) (-30, -5)	5.04%	0.000***	4.81%	0.000***
(7) (-5, -1)	4.60%	0.000***	4.48%	0.000***
Paired Two-Sample T-Test	mean	p-value	mean	p-value
Diff (5)–(1)	-2.12%	0.042**	-1.91%	0.063*
Diff (5)–(2)	-0.75%	0.054*	-0.45%	0.196
Diff (5)–(3)	-1.06%	0.268	-1.07%	0.299
Diff (5)–(4)	-0.53%	0.192	-0.36%	0.362
Diff (5)–(6)	-0.50%	0.157	-0.46%	0.185
Diff (5)–(7)	-0.06%	0.889	-0.14%	0.764

*** significant at 1%, ** significant at 5%, * significant at 10%.

Table 1.5 Underwriting Fee and Underpricing in IPO

Four control samples are Chinese domestic IPOs with gross proceeds matching (*Ctrl_CHN_Proceeds*), Chinese domestic IPOs with market capitalization matching (*Ctrl_CHN_MarketCap*), U.S. domestic IPOs with gross proceeds matching (*Ctrl_US_Proceeds*), and U.S. domestic IPOs with market capitalization matching (*Ctrl_US_MarketCap*). Underwriting fee is considered as the direct cost of IPO charged by IPO underwriters. Underpricing is the indirect cost of IPO and is the difference of IPO offer price and first-day closing price, scaled by first-day closing price.

	Underwriting Fee		**Underpricing**	
	mean	p-value	mean	p-value
(1)*Two-Stage Firms*	6.15%	0.000***	5.04%	0.000***
(2)*Ctrl_CHN_Proceeds*	4.58%	0.000***	138.11%	0.000***
(3)*Ctrl_CHN_MarketCap*	4.47%	0.000***	109.19%	0.000***
(4)*Ctrl_US_Proceeds*	7.04%	0.000***	6.26%	0.000***
(5)*Ctrl_US_MarketCap*	6.85%	0.000***	15.88%	0.000***
	mean	p-value	mean	p-value
Diff (1)–(2)	1.57%	0.000***	-133.07%	0.000***
Diff (1)–(3)	1.68%	0.000***	-104.15%	0.000***
Diff (1)–(4)	-0.88%	0.000***	-1.22%	0.618
Diff (1)–(5)	-0.70%	0.001***	-10.84%	0.009***

*** significant at 1%, ** significant at 5%, * significant at 10%.

Table 1.6 Factors Impacting Underwriting Fee and Underpricing in IPO

The impact on IPO underwriting fee and underpricing are investigated in this table. The eight factors include: follow-up equity offering, reduction in firm-specific risk (relative to Shanghai Stock Exchange A Share Index), reduction in firm-specific risk (relative to Russell 2000 Index), time interval between backdoor listing and IPO, audit quality and underwriter reputation.

Panel A Follow-Up Equity Offering

Average underwriting fee and average underpricing are reported based on two-stage firm's follow-up equity offering. Follow-up equity offering is used as a binomial variable. We investigate a two-stage firm within three aftermarket years. If it conducts equity offering during this three-year period, it has follow-up equity offering. Due to the small sample size, we don't investigate the impact of absolute size or relative size of the follow-up equity offering.

	N	Underwriting Fee		Underpricing	
		mean	p-value	mean	p-value
(1) Yes	47	5.62%	0.000***	6.66%	0.000***
(2) No	24	6.42%	0.000***	4.21%	0.000***
Diff (1)–(2)	71	0.80%	0.084*	-2.45%	0.411

*** significant at 1%, ** significant at 5%, * significant at 10%.

Panel B Reduction in Firm-Specific Risk (relative to Shanghai Stock Exchange A Share Index)

Average underwriting fee and average underpricing are reported based on the reduction of a two-stage firm's firm-specific risk in pre-IPO period. Firm-specific risk is calculated relative to Shanghai Stock Exchange A Share Index. The reduction is measured as the difference of the firm-specific risk from 150 days to 180 days prior to IPO, and the firm-specific risk from 30 days to 60 days prior to IPO.

	N	Underwriting Fee		Underpricing	
		mean	p-value	mean	p-value
(1) High (>= 1.13%)	25	5.60%	0.000***	3.80%	0.000***
(2) Low(< 1.13%)	26	5.61%	0.000***	7.11%	0.000***
Diff (1)–(2)	51	-0.01%	0.966	-3.31%	0.273

*** significant at 1%, ** significant at 5%, * significant at 10%.

Panel C Reduction in Firm-Specific Risk (relative to Russell 2000 Index)

Average underwriting fee and average underpricing are reported based on the reduction of a two-stage firm's firm-specific risk in pre-IPO period. Firm-specific risk is calculated relative to Russell 2000 Index. The reduction is measured as the difference of the firm-specific risk from 150 days to 180 days prior to IPO, and the firm-specific risk from 30 days to 60 days prior to IPO.

	N	Underwriting Fee		Underpricing	
		mean	p-value	mean	p-value
(1) High (>=0.92%)	26	5.61%	0.000***	3.69%	0.000***
(2) Low (<0.92%)	25	5.60%	0.000***	7.36%	0.000***
Diff (1)–(2)	51	0.01%	0.967	-3.66%	0.233

*** significant at 1%, ** significant at 5%, * significant at 10%.

Panel D Time Interval between Listing and IPO

The threshold of time interval between backdoor listing and IPO is one year; this is driven by the argument that firm-specific information can be disseminated to the public in annual reports which are filed on annual basis. Time interval between backdoor listing and IPO is measured in months.

	N	Underwriting Fee		Underpricing	
		mean	p-value	mean	p-value
(1) less than 1 year	13	8.07%	0.000***	6.69%	0.000***
(2) more than 1 year	56	5.75%	0.000***	4.98%	0.000***
Diff (1)–(2)	69	2.32%	0.000***	1.71%	0.690

*** significant at 1%, ** significant at 5%, * significant at 10%.

Panel E Audit Quality

Audit quality is an ordinal variable consisting of four tiers: tier 4 includes the Big Four audit firms; tier 3 includes the audit firms ranking in the top 5 to 50 in www.vault.com; tier 3 includes audit firms that are not in www.vault.com but have a corporate website and more than five employees as disclosed on their website; tier 4 includes the audit firms that are not in www.vault.com, have no corporate website and have less than five employees.

	N	Underwriting Fee		Underpricing	
		mean	p-value	mean	p-value
(1)higher than 2.5	50	6.16%	0.000***	5.38%	0.000***
(2)lower than 2.5	19	6.00%	0.000***	4.10%	0.000***
Diff (1)–(2)	69	0.16%	0.716	1.27%	0.635

*** significant at 1%, ** significant at 5%, * significant at 10%.

Panel F Underwriter Reputation

Underwriter reputation is an ordinal variable ranging from one to nine. The rankings of each underwriter are offered by Jay Ritter. We collect the data from Jay Ritter's website.

	N	Underwriting Fee		Underpricing	
		mean	p-value	mean	p-value
(1) High (>= 5)	16	6.06%	0.000***	3.18%	0.000***
(2) Low(<5)	51	6.25%	0.000***	4.62%	0.000***
Diff (1)–(2)	67	-0.19%	0.656	-1.43%	0.663

*** significant at 1%, ** significant at 5%, * significant at 10%.

Table 1.7 Multivariate Analysis

Four linear regressions are performed to investigate the impact of four independent variables. The dependent variables are underwriting fee and underpricing; the independent variables are reduction in firm-specific risk, time interval between backdoor listing and IPO, audit quality and underwriter reputation. *RiskReduction_RU* is the difference in risk from 150 to 180 days prior to IPO and from 30 to 60 days prior to IPO. *Time* is the number of months between a two-stage firm's backdoor listing and IPO. *Audit* is audit quality measured with the four-tier framework in Ang et al. (2014).*Underwriter* is an ordinal variable; it uses a scale from one to nine to measure the ranking or reputation of IPO underwriter. One represents lowest reputation; nine represents highest reputation. The rankings are obtained from Jay Ritter's database. For each dependent variable, we perform two linear regressions. R squares and p values for individual regression are reported as well.

	Underwriting Fee				**Underpricing**			
	Model A		**Model B**		**Model C**		**Model D**	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
RiskReduction_RU	0.187	0.257			-0.109	0.51	-0.258	0.072*
Time	-0.055	0.733	-0.435	0.001***	0.007	0.964		
Audit	-0.122	0.452	-0.023	0.855	0.663	0.511	0.121	0.391
Underwriter	0.084	0.6	-0.011	0.927	0.161	0.321		
	R Square	p - value	R Square	p - value	R Square	p - value	R Square	p - value
	0.066	0.604	0.184	0.007***	0.054	0.693	0.086	0.122
N	43		62		43		49	

*** significant at 1%, ** significant at 5%, * significant at 10%.

Table 1.8 Two-Stage Firm's IPO Timing

Cumulative 3-month returns are reported to show the timing of two-stage firm's IPO. Returns on Shanghai Stock Exchange A Share Index, Russell 2000 Index and U.S. dollar relative to Chinese Yuan are reported for four time periods: from one month to three-month prior to IPO, from four to six months prior to IPO, from seven to nine months prior to IPO and from ten to twelvemonths prior to IPO. Mean difference as well as p values derived from t statistics are reported as well.

Panel A Cumulative Return on Shanghai Stock Exchange A Share Index prior to IPO

Average three-month cumulative returns on Shanghai Stock Exchange A Share Index are reported for two-stage firm sample and two control samples: Chinese domestic IPOs with gross proceeds matching (*Ctrl_CHN_Proceeds*) and Chinese domestic IPOs with market capitalization matching (*Ctrl_CHN_MarketCap*). Four time periods are investigated: from one month to three-month prior to IPO, from four to six months prior to IPO, from seven to nine months prior to IPO and from ten to twelve months prior to IPO.

	(-12, -10)		**(-9, -7)**		**(-6, -4)**		**(-3, -1)**	
	mean	p - value	mean	p - value	mean	p - value	mean	p - value
(1) *Two-Stage Firms*	6.39%	0.012**	7.34%	0.003***	7.87%	0.001***	4.19%	0.037**
(2) *Ctrl_CHN_Proceeds*	-0.43%	0.772	2.01%	0.108	0.91%	0.488	-0.06%	0.952
(3) *Ctrl_CHN_MarketCap*	2.40%	0.155	2.16%	0.114	3.29%	0.037**	-0.53%	0.721
Diff (1) - (2)	6.83%	0.011**	5.33%	0.041**	6.95%	0.007***	4.26%	0.047**
Diff (1) - (3)	3.98%	0.195	5.17%	0.073*	4.57%	0.096*	4.73%	0.064*

*** significant at 1%, ** significant at 5%, * significant at 10%.

Panel B Cumulative Return on Russell 2000 Index prior to IPO

Average three-month cumulative returns on Russell 2000 Index are reported for two-stage firm sample and two control samples: U.S. domestic IPOs with gross proceeds matching (*Ctrl_US_Proceeds*) and U.S. domestic IPOs with market capitalization matching (*Ctrl_US_MarketCap*). Four time periods are investigated: from one month to three-month prior to IPO, from four to six months prior to IPO, from seven to nine months prior to IPO and from ten to twelve months prior to IPO.

	(-12, -10)		**(-9, -7)**		**(-6, -4)**		**(-3, -1)**	
	mean	p - value	mean	p - value	mean	p - value	mean	p - value
(1)*Two-Stage Firms*	-3.96%	0.053	2.24%	0.255	5.16%	0.002***	7.97%	0.000***
(2)*Ctrl_US_Proceeds*	4.83%	0.000***	5.87%	0.000***	2.25%	0.018**	5.51%	0.000***
(3) *Ctrl_US_MarketCap*	5.13%	0.000***	5.63%	0.000***	3.24%	0.003***	4.39%	0.000***
Diff (1)–(2)	-8.80%	0.000***	-3.62%	0.095*	2.90%	0.149	2.46%	0.069*
Diff (1)–(3)	-9.10%	0.000***	-3.39%	0.122	1.92%	0.336	3.57%	0.013**

*** significant at 1%, ** significant at 5%, * significant at 10%.

ESSAY TWO: EARNINGS MANAGEMENT, FRAUD AND AUDITOR CHOICE

Abstract

Two-stage firms and U.S. conventional IPOs use a similar degree of earnings management in both pre-IPO and post-IPO periods. For two-stage firms, the aggressive use of earnings management in pre-IPO period leads to higher IPO valuation but lower stock market performance in post-IPO period. This evidence supports the valuation relevance hypothesis and the disappointment hypothesis. Moreover, we do not find any significant evidence indicating that two-stage firms are more likely to commit fraud than the U.S. conventional IPOs. We do not find any significant causal relationship between the aggressive use of earnings management and fraud committed by two-stage firms, either.

This essay has two motivating factors. First, since the Chinese two-stage firms use an IPO process that is different from the conventional IPO firms, they may have different patterns in terms of earnings management, fraud and auditor choice. However, we haven't come across any study investigating these issues. Secondly, the Chinese two-stage firms are subject to their specific country risk. For example, Ang et al. (2014) reported that 49 U.S.-listed Chinese firms were either sued by investors or prosecuted by SEC. Another 29 were either suspected by financial press or identified in research reports. The accused and suspected incidents of fraud included investor interest that damaged transactions; improper issue of securities at artificially low prices; poor internal control; frequent auditor changes (poor auditing); inflated or nonexistent revenues; inflated earnings; related party transactions; insider tunneling; inflated or nonexistent assets; hidden liabilities; hidden expenses; inflated cash; and issuing false or misleading statements. Researchers suspected that these incidents of frauds were the result of an aggressive use of earnings management (Dechow et al., 1996;

Perols and Lougee, 2011). When a firm runs out of room for earnings management, it will commit fraud. As the Chinese two-stage firms only list in the U.S. and their operating businesses are in China, they may be subject to similar risk as the other U.S.-listed Chinese firms.

In our study, we provide an in-depth investigation of the earnings management and incidents of fraud for two-stage firms within three years of IPO. Then we test the value relevance hypothesis and the disappointment hypothesis to show the impact of earnings management on IPO valuation and post-IPO stock market performance. We find that two-stage firms manipulate earnings during the pre-IPO period, but the degree of earnings management isn't significantly different from the U.S. conventional IPOs. The two-stage firms with higher degrees of earnings management tend to have higher stock market valuation during IPO, but lower stock market performance during the post-IPO period. We find that the aggressive use of earnings management relative to the Chinese domestic peers in the same industry[43] can help two-stage firms improve IPO valuation. However, it has an insignificant impact on two-stage firms' stock market performance during the post-IPO period. On the other hand, the aggressive use of earnings management relative to the U.S. domestic peers in the same industry[44] has an insignificant impact on two-stage firms' IPO valuation, but a significantly negative impact on stock market performance during the post-IPO period. Overall, we find that 34 two-stage firms (representing 48% of our sample) have committed fraud. However, we don't find any evidence of a causal relationship between earnings management and incidents of fraud. On the other hand, we find that CEO-Chairman duality significantly

[43] The constituent firms listing in Shanghai Stock Exchange A Share Index.
[44] The constituent firms listing in Russell 2000 Index.

increases the possibility for two-stage firms to commit fraud after IPO. We find that two-stage firms may be fully aware of the signaling effect of auditor choice. When they have CEO-Chairman duality and their headquarters are located in low trustworthy province/territory, they tend to hire high-quality auditors. But we don't find any significant impact of auditor choice on IPO underpricing. This is probably because the signaling effect of auditor choice is already priced into two-stage firms' valuation during the pre-IPO period.

The remainder of this essay is organized as follows. The literature review and hypothesis development are discussed in the next section. We then define our variables and introduce the empirical design. Lastly, we provide results and draw conclusions based on these results.

Literature Review and Hypothesis Development

In this section, we review the previous studies on earnings management, fraud and auditor choice. We believe that the Chinese and U.S. evidence in these studies can provide reference for our study. Lastly, we develop hypotheses in the context of two-stage firms.

Earnings Management and Fraud

Previous studies have developed two hypotheses regarding the impact of earnings management on IPO firms' stock market performance.

Value Relevance Hypothesis

The value relevance hypothesis asserts that investors rely on disclosure by IPO firms, but that they don't fully recognize the difference in accounting policies across IPO firms. This gives IPO firm managers the incentive and opportunity to inflate the reported earnings. As a result, investors could be temporarily deceived about the IPO firm's fundamental value. In empirical studies, researchers often use discretionary current accruals to measure the degree of earnings management. Their evidence shows that when firms expect to raise capital, they tend to boost reported earnings with earnings management techniques. DuCharme et al. (2001) found a positive correlation between the level of pre-IPO discretionary current accruals and the initial value of IPO firms in the U.S. Teoh et al. (1998) found that a firm's discretionary current accruals are significantly positive during the IPO year, then decline to zero during post-IPO years. As investors are unaware of earnings management, they pay a high price for IPOs. They found that earnings management also has a signaling effect. The IPO firms in the most conservative quartile of earnings management tend to issue more follow-up equity offerings.

The findings on the Chinese domestic IPOs are also consistent with the value relevance hypothesis. Aharony et al. (1999) and Aharony et al. (2009) found that the Chinese domestic IPOs are frequently involved in earnings management and tunneling, which moves capital between two parties in the form of debt. During the pre-IPO period, these firms prop up earnings by accelerating credit sales to their related parties (usually the parent companies). This enables the firms to raise more proceeds from the minority shareholders. During the post-IPO period, these firms tunnel their assets and profits back to the related parties via corporate loans. The information on related-party transactions is disclosed in financial

statements, but it is not reflected in stock price. The evidence indicates that the Chinese investors fail to identify the association between earnings management and tunneling behavior.

Ang et al. (2014) investigated the relationship between earnings management and fraud in the U.S.-listed Chinese firms.[45] They found that these (bad apple) firms tended to be in the materials, capital goods, software, and service industries. They are likely to go public via backdoor listing.[46] Their largest shareholders have strong controlling power and their headquarters are located in less trustworthy provinces/territories in China. Because the bad apple firms are of low-quality and have more to hide, they tend to hire small, less prestigious auditors, investment banks and law firms to provide listing service. Ang et al. (2014) argued that because the good and bad apple firms do not have significantly different debt-paying and cash generating abilities, fraud is a result of a firm's long-term involvement in earnings management.

While the findings in Ang et al. (2014) provide reference to our study, we notice that their study is different from ours in many aspects. First, the sample in Ang et al. (2014) includes different types of firms.[47] As the characteristics of these firms are significantly different, it is uncertain which of them drive the results in Ang et al. (2014). Unfortunately, Ang et al. (2014) did not provide any robustness testing on sub-samples. Secondly, Ang et al. (2014) hypothesized that fraud is the result of earnings management, but they did not provide any

[45] This study differs from Ang et al. (2014) as their study investigates all the U.S.-listed Chinese firms. In this study, the focus is on the two-stage firms.
[46] 59% of the bad apple firms used backdoor listing, compared with 37% for the good apple firms.
[47] The firms include cross-listing firms, conventional IPOs and backdoor listing firms.

empirical evidence to prove it. In our study, we use a logistic regression model to investigate the impact of many factors, including earnings management, on fraud.

Disappointment Hypothesis

The use of earnings management could cause substantial costs due to litigation, damaged personal and corporate reputations and loss of future accounting flexibility. The disappointment hypothesis suggests that as investors get more information about an IPO firm, they recognize that the earnings momentum during the IPO year cannot be maintained. When they become less optimistic about the IPO firm, the firm's stock market performance deteriorates. Both Teoh et al. (1998) and DuCharme et al. (2001) found that for the U.S. conventional IPOs, the degree of earnings management during the IPO year has a significant positive correlation with IPO firms' aftermarket underperformance. The evidence supports the disappointment hypothesis.

Auditor Choice

Auditors act as protectors of the quality of a firm's accounting disclosure. They are expected to ensure a firm's internal control processes are adequate to detect potential fraudulent acts. Karim et al. (2010) argued that auditors play two significant roles in the market place: (a) to minimize the cost incurred through moral hazard at the expense of a higher monitoring cost, and (b) to report the attributes of the firm issuing audited financial statements. We haven't found any evidence relevant to the auditing practices of two-stage firms in the U.S. However, McFarland (2012) provides evidence relevant to 56 Chinese firms listed in Canada. He reported a wide gap between auditing expectations and practices. The Canadian-listed

Chinese firms tend to go public through backdoor listing. These firms use Canadian auditors. But because their operating businesses are in China, their Canadian auditors usually rely on the Chinese local partners to perform auditing. However, the Chinese local partners tend to lack training and experience. More importantly, they are reluctant to challenge their clients. As a result, the auditing services provided to the Canadian-listed Chinese firms are of lower quality than the services provided to the local Canadian firms. Yet Canadian investors assume the audit performed on the Chinese firms is being done according to North American standards. In 2011, the Canadian Public Accountability Board (CPAB) investigated 24 Chinese firms, and 12 of them demonstrated auditing flaws.

The Chinese evidence also indicates that there are very weak auditing mechanisms in China to identify frauds.[48] Chinese companies tend to choose mid-sized and small auditing firms that have a close relationship with their executives. Karim et al. (2010) summarized three factors causing this relationship-based auditor choice: (a) since many companies are still in the development stage, their purpose for choosing an auditor is statutory compliance rather than value addition; (b) the auditor appointment process in the state-owned enterprises (SOEs) is not always transparent; and (c) as corruption in society affects auditor choice, companies are more likely to have successful negotiations by pressuring medium and small auditors instead of influencing larger auditing firms. Lin and Liu (2008) reported that the Chinese domestic IPOs with high ownership concentration and CEO-Chairman duality are likely to hire low-quality auditors. Higher shareholder ownership enables the largest

[48] Before 1998, all the Chinese domestic auditors are public employees who are not rewarded for high-quality audits and are not explicitly penalized for audit failure. After 1998, international audit firms, such as Big Four[48], entered into China by forming partnerships with Chinese local audit firms.

shareholder to take private benefits from the business. Because the firm has more to hide, it is reluctant to hire a high-quality auditor. CEO-Chairman duality in a firm's governance structure enables the firm's management to take private benefits, thus the management has an incentive to hire a low-quality auditor.

A form's choice of auditor also has a signaling effect on a firm's valuation. The U.S. evidence suggests that auditor choice is correlated with IPO underpricing (Beatty, 1989; Willenborg, 1999; Albring et al. 2007). Titman and Trueman (1986) reported that riskier firms in the U.S. tend to hire low-quality auditors because the fees for a high-quality audit could outweigh the benefits of reducing the costs of capital and underpricing. But Datar et al. (1991) found that riskier firms are more likely to choose high-quality auditors to mitigate information asymmetry. Copley and Douthett (2002) argued that IPO firms use a combination of signals, including auditor choice, earnings disclosure and ownership concentration, to reduce IPO underpricing. Hiring a large auditing firm signals a high-quality audit.[49]

Hypotheses

Based on the discussions on the U.S., Canadian and Chinese evidence, we develop our key hypothesis in this section. Our hypotheses are as follows.

Previous studies use DCA (discretionary current accruals) to measure the magnitude of earnings management. Detailed discussion on this measure is provided in the Research

[49] Hiring large auditors might lead to fee premia as well. Positive fee premia is found in the U.S. (Palmrose, 1996; Gist, 1992) and Australia (Francis, 1984; Francis and Stokes, 1986). But results on fee premia charged by large auditors are mixed in other countries, such as Canada (Anderson and Zeghal, 1994; Simunic, 1980; Chung and Lindsay, 1988) and U.K. (Taffler and Ramalinggam, 1982; Chan et al., 1993; Brinn et al., 1994).

Design and Variable Definition section. In this essay, we have two arguments on two-stage firms' DCA. On the one hand, the accounting disclosure and have trading history prior to the IPO disseminate the information about a two-stage firm's valuation. Therefore, two-stage firm managers should have less incentive to boost earnings around the IPO period. Accordingly, we would detect lower DCA, thus lower degree of earnings management compared to the control samples of conventional IPOs. On the other hand, as some two-stage firms conduct IPOs shortly after public listing, their trading history may not be long enough for investors to significantly reduce valuation uncertainty for investors. Firm managers would then have the opportunity to manipulate earnings during the pre-IPO period. Considering the two arguments, we test the value relevance hypothesis as follows:

Hypothesis 2.1 *On average, two-stage firms have lower discretionary current accruals in pre-IPO period than the control samples of conventional IPOs.*

Hypothesis 2.2 *The two-stage firms with longer time intervals between listing and IPO have lower discretionary current accruals.*

Based on the disappointment hypothesis, we expect that the two-stage firms with more aggressive earnings management around the IPO period wouldn't be able to maintain the same earnings momentum during the post-IPO period. When investors are disappointed at these firms, they give lower valuation, causing the decline in stock market returns. In addition, we argue that for two-stage firms, the disappointment hypothesis should be

carefully tested by controlling for firm specific characteristics. That is, because two-stage firms are small in size, their stock market performance should be particularly adjusted for the size effect. In this study, our measures of stock market performance include both buy-and-hold abnormal return and alpha in Carhart four-factor model; the latter adjusts firm's stock market return for firm specific characteristics including size, book-to-price ratio and return momentum. We test the disappointment hypothesis as follows:

Hypothesis 2.3 *The two-stage firms with higher discretionary current accruals during the pre-IPO period have lower stock market performance during the post-IPO period.*

Based on the arguments in previous studies, we expect that two-stage firms with higher largest shareholder ownership and CEO-Chairman duality would enable the shareholders and management to take private benefits. As these firms have more to hide, they tend to hire low-quality auditors. We expect that:

Hypothesis 2.4 *The two-stage firms with the largest shareholder ownership are more likely to hire low-quality auditors.*

Hypothesis 2.5 *The two-stage firms with CEO-Chairman duality are more likely to hire low-quality auditors.*

Auditor choice is found to impact a conventional IPO firms' valuation. Hiring a reputable auditor signals the quality of the IPO firms' financial statements. Therefore, it reduces the information asymmetry between investors and the IPO firm, which then reduces the level of IPO underpricing. However, in the case of a two-stage IPO process, we expect a different result. First, conventional IPO investors may not have information on a firm's choice of auditor during the pre-IPO period. However, since two-stage firms disclose financial statements, investors know the firm's auditors. More importantly, conventional IPOs do not have public listing status during the pre-IPO period. Although conventional IPO investors have the information on auditor choice prior to the IPO, they cannot price the information until on and after the IPO day. Yet since two-stage firm shares are publicly traded prior to the IPO, investors are able to price the auditor choice information into the share price during the pre-IPO period. Therefore, the disclosure of auditor choice during the IPO impacts conventional IPO underpricing. However, it may not affect the two-stage firm's IPO underpricing. We expected that:

Hypothesis 2.6 *The two-stage firm's auditor choice doesn't have a significant impact on IPO underpricing.*

Empirical Design and Variable Definitions

In this section, we describe the methods we used to measure discretionary current accruals and audit quality. We also introduce the logistic regression models and linear regression

models for hypothesis testing purposes. Lastly, we define the variables that are associated with these methods and models.

Discretionary Current Accruals (DCA)

We use discretionary current accruals (DCA) to measure the degree of earnings management. Discretionary current accruals are also called short-term accounting adjustment, short-term accruals or managed accruals. They are the accounting adjustments on short-term assets and liabilities. Teoh et al. (1998) stated,

> *"… managers can increase current accruals, for example, by advancing recognition of revenues with credit sales (before cash is received), by delaying recognition of expenses through assumption of a low provision for bad debts, or by deferring recognition of expenses when cash is advanced to suppliers. Thus, it is difficult for investors to infer how much of the accruals are discretionary (i.e. unusual managerial choices given the underlying timing of cash flows)."*

The academic studies often use the methods in Jones (1991), Dechow et al. (1995) and Teoh et al. (1998) to quantify discretionary current accruals.

In our study, we use the Teoh et al. (1998) model.[50] The detailed steps to calculate discretionary current accruals (DCA) are as follows:

[50] Teoh et al. (1998) used an extension of Jones' (1991) model to measure an IPO firm's DCA. They argued that DCA indicates the extent to which a firm manages earnings.

Step 1. *Generate estimates of firm-specific parameters,* α_0 and α_1 *from the estimation sample of all two-digit SIC code peers.*

$$\left(CA_{j,t}/TA_{j,t-1}\right) = \alpha_0\left(1/TA_{j,t-1}\right) + \alpha_1\left(\Delta Sales_{j,t}/TA_{j,t-1}\right) + \epsilon_{j,t} \qquad (2.1)$$

Where

TA = the total assets, $\Delta Sales$ = the change in sales, and CA = the current accruals defined as:

$$CA = \Delta(Accounts\ Receivables + Inventory) - \Delta(Accounts\ Payable + Other\ Current\ Liabilities)$$

Step 2. *Use the estimated* α_0 and α_1 *to calculate non-discretionary current accruals (NDCA) for two-stage firms and the control sample of matching firms.*

$$NDCA_{it} = \tilde{\alpha}_0\left(1/TA_{i,t-1}\right) + \tilde{\alpha}_1\left(\Delta Sales_{i,t} - \Delta TR_{i,t}\right)/TA_{i,t-1} \qquad (2.2)$$

Where

$\Delta TR_{i,t}$ = the change in trade receivables.

Step 3.*The discretionary current accruals (DCA) are the difference between current accruals (CA) and non-discretionary current accruals (NDCA).*

$$DCA_{i,t} = CA_{i,t}/TA_{i,t-1} - NDCA_{i,t} \qquad (2.3)$$

Detailed definitions on each variable are provided in Table 2.1.

Measurement of Audit Quality

Previous studies found that the size of an audit firm is an effective proxy for audit quality (DeAngelo, 1998; Lee et al., 2003; Lennox, 2005; Lin and Liu, 2009). DeAngelo (1981) showed that audit quality is dependent of audit firm size; auditors with larger number of clients have more to lose, so they tend to provide service with higher quality. Becker (1998) also found that firms with Big Six auditors tend to less overstate earnings than firms with non-Big Six auditors. We notice the argument that audit quality and audit firm size may not be positively correlated; small auditors may not necessarily provide low-quality service. However, as we couldn't find other measures proven effective, we simply use the size of audit firm as a proxy for audit quality.

In our study, we use the four-tie framework developed by Ang el al. (2012) to measure audit quality. Ang el al. (2012) specifically investigated the audit firms serving the U.S.-listed Chinese firms. They divided these audit firms into four tiers: the first tier includes the Big Four; the second tier includes the audit firms ranking in the top five to 50 in www.vault.com; the third tier includes the audit firms that are not in www.vault.com but have a corporate website and more than five employees as disclosed on their website; the fourth tier includes the audit firms that are not in www.vault.com, do not have a corporate website and have fewer than five employees. Based on Ang et al. (2014), we assign scores scaling from one to four to audit firms: four represents the highest audit quality or the first tier audit firms in Ang

el al. (2012); one represents the lowest audit quality, or the fourth tier audit firms in Ang el al. (2012).

Logistic Regression Model

We use logistic regression models to achieve two objectives: (a) to compare the characteristics of two-stage firms and control samples of conventional IPOs, and (b) to identify the characteristics of the two-stage firms that have committed fraud. We use the following logistic regression model for the first objective:

$$Logit(p_i) = \alpha_0 + \alpha_1 Size_i + \alpha_2 Fraud_i + \alpha_3 DCA_i \quad (2.4)$$

Where *p* is a dummy variable; it equals 1 if the observation is a two-stage firm, and 0 if the observation is in the control samples of conventional IPOs.

We use the following logistic regression model for the second objective:

$$Logit(p_i) = \alpha_0 + \alpha_1 Audit_i + \alpha_2 Duality_i + \alpha_3 Underwriter_i + \alpha_4 Ownership_i + \alpha_5 Trust_i + \alpha_6 DCA_i \quad (2.5)$$

Where *p* is a dummy variable for the occurrence of fraud that equals 1 if a two-stage firm is accused or suspected to have fraudulent act within three aftermarket years, and 0 otherwise.

Linear Regression Model

We use the following linear regression model to test the variables that may have had an impact on two-stage firms' discretionary current accruals:

$$DCA_i = \alpha_0 + \alpha_1 Audit_i + \alpha_2 Duality_i + \alpha_3 Ownership_i + \alpha_4 Time_i \quad (2.6)$$

We use the same linear regression model as DuCharme et al. (2001) to test the value relevance hypothesis and the disappointment hypothesis. The linear regression model for testing the value relevance hypothesis is as follows:

$$V_i = \alpha_0 + \alpha_1 CFO_i + \alpha_2 SG_i + \alpha_3 Audit_i + \alpha_4 DCA_i \quad (2.7)$$

where the independent variable, *V*, is the natural logarithm of the initial firm value; equal to the offer price times the number of shares outstanding after the IPO adjusted for firm's total assets.

The linear regression models to test the disappointment hypothesis are as follows:

$$Operating\ ROA_i = \alpha_0 + \alpha_1 DCA_i + \alpha_2 NDCA_i \quad (2.8)$$

$$BHAR_i = \alpha_0 + \alpha_1 DCA_i + \alpha_2 NDCA_i \quad (2.9)$$

$$Alpha_i = \alpha_0 + \alpha_1 DCA_i + \alpha_2 NDCA_i \quad (2.10)$$

where $Operating\ ROA_i$ is operating return on assets for two-stage firm *i*; $BHAR_i$ is two-stage firm *i*'s buy-and-hold abnormal return within three years of IPO; $Alpha_i$ is the interaction term in Carhart four-factor model within three years of IPO.

The linear regression model to test the variables affecting two-stage firms' choice of auditor is as follows:

$$Audit_i = \alpha_0 + \alpha_1 Size_i + \alpha_2 Ownership_i + \alpha_3 Duality_i + \alpha_4 Trust_i \quad (2.11)$$

The linear regression model to test the variables affecting two-stage firm's IPO underpricing is as follows:

$$Underpricing_i = \alpha_0 + \alpha_1 Size_i + \alpha_2 Ownership_i + \alpha_3 Audit_i \quad (2.12)$$

Variable Definitions

We use many variables in testing our hypotheses. The names and descriptions for these variables are listed in Table 2.1.

Empirical Results

In this section, we report the results on two-stage firms' earnings management, incidence of fraud and choice of auditor. Discussions on the results are provided as well.

Earnings Management

We use discretionary current accruals (DCA) as an indicator to measure the extent to which a firm manipulates its reported earnings. Table 2.2 shows the discretionary current accruals for two-stage firms and the control samples of conventional IPOs. In Panel A, the discretionary current accruals are calculated relative to the constituent firms listing in the Shanghai Stock Exchange A Share Index. We find significant positive discretionary current accruals for two-stage firms during the time period from one year before IPO (*t-1*) to two years after IPO (*t+2*). The largest discretionary current accruals of 0.191 occur during the IPO year (*t*). Overall, the findings show that two-stage firms use aggressive earnings management before and after the IPO. Also for the time period from *t-1* to *t+2*, the discretionary current accruals for two-stage firms are 0.065 to 0.173 higher than the two control samples of Chinese domestic IPOs (*Ctrl_CHN_Proceeds* and *Ctrl_CHN_MarketCap*). The difference is statistically significant. We argue that this result is driven by the specific IPO process in China. Because the Chinese firms need to have government approval of their IPO application, they have to face the uncertainty about whether they are allowed to conduct an IPO, and when. They cannot use aggressive earnings management prior to the IPO because the waiting period could be long enough that the aggressive earnings management wouldn't be able to persist. In such a case, a declining earnings momentum during the pre-IPO period would have a negative impact on the IPO

valuation. When the IPO application is finally approved, they won't have a sufficient window of time to use large scale of earnings management, either. We also notice that two-stage firms' discretionary current accruals decline to 0.031 in the third year of IPO (*t+3*). Although it is still higher than the Chinese conventional IPOs, the difference is insignificant. This finding suggests that after two years of IPO, two-stage firms and the Chinese conventional IPOs are indifferent in terms of the degree of earnings management.

In Panel B, we use the Russell 2000 Index as a benchmark index and compare two-stage firms with the U.S. conventional IPOs. Although the positive discretionary current accruals for two-stage firms range from 0.028 to 0.115 during the time period one year before IPO (*t-1*) to one year after IPO (*t+1*), only the discretionary current accruals of 0.115 during the IPO year (*t*) are statistically significant. Then the discretionary current accruals for two-stage firms turn negative: they are -0.085 and -0.074 in the second and third years of IPO (*t+2* and *t+3*), respectively. It indicates that two-stage firms boost earnings in IPO year, and then gradually reverse the impact in post-IPO years. When we compare two-stage firms with the U.S. gross proceeds matching sample (*Ctrl_US_Proceeds*), the difference in discretionary current accruals ranges from -0.123 to 0.011, but are not statistically significant. The result indicates that two-stage firms and the U.S. conventional IPOs use a similar degree of earnings management around the IPO years. On the other hand, we find the difference between two-stage firms and the U.S. market capitalization matching sample (*Ctrl_US_MarketCap*) is statistically significant in *t-1*, *t* and *t+3*. We argue that the result is likely driven by our sample selection process. There are a limited number of matching firms available for us to form our control samples. We try to avoid using the same matching firm in two different control

samples, so we have to include a few larger-sized firms in *Ctrl_US_MarketCap*. These firms may be of better quality. They may not heavily depend on earnings management in terms of maximizing IPO valuation and don't have strong incentive to manipulate earnings like the smaller-sized firms do. Therefore, compared to these larger-sized firms, two-stage firms use more aggressive earnings management before and during IPO year (*t-1* and *t*).

In Table 2.3, we use logistic regression models to test the robustness of our results in Table 2.2. The logistic regression models also help identify the variables able to differentiate two-stage firms from the control samples of conventional IPOs. In these models, the independent variable is binomial; it is equal to 1 if an observation is a two-stage firm and 0 if it is a control firm. The dependent variables include market capitalization on the IPO day (*Size*), discretionary current accruals (*DCA_SH* and *DCA_RU*) and act of fraud (*Fraud*). In our study, if we find that a two-stage firm is sued by investors, prosecuted by security regulators or suspected by financial presses and research papers, we consider the firm to have committed fraud. In Model A, we find significantly positive regression coefficients of 0.497, 1.671 and 3.064 for *Size*, *DCA_SH t-1* and *DCA_SH t*, indicating that two-stage firms are larger than the Chinese gross proceeds matching sample (*Ctrl_CHN_Proceeds*) and have higher discretionary current accruals prior to IPO. In Model B, only the regression coefficient of 5.890 for *DCA_SH t* is statistically significant. It confirms the result in Model A regarding the impact of the dependent variable *DCA_SH*. In addition, we notice that the Chi squares for both Model A and Model B are statistically significant, indicating that the discretionary current accruals are a significant factor that can differentiate two-stage firms from the Chinese conventional IPOs. When we compare two-stage firms with the U.S. conventional

IPOs, neither regression coefficients nor the Chi square in Model C are statistically significant, indicating that two-stage firms and the U.S. conventional IPOs are indifferent in terms of discretionary current accruals. In Model D, the regression coefficients for *DCA_RU t-1* and *DCA_RU t* are insignificant as well. The significantly negative regression coefficient of -1.200 for *Size* shows that two-stage firms are significantly smaller than the U.S. market capitalization matching sample (*Ctrl_US_MarketCap*). The size factor contributes to the significant Chi square in Model D, thus the difference between the two groups of firms. Once again, this is driven by the sample selection process we have discussed previously.

Overall, the findings in Table 2.2 and Table 2.3 don't support our Hypothesis 2.1. We were expecting that because the trading history and the release of financial information during the pre-IPO period would reduce valuation uncertainty for investors, so two-stage firms' management would have less incentive to manipulate earnings prior to the IPO. We then expected to find lower discretionary current accruals for two-stage firms compared to the conventional IPOs. But in fact, our empirical results show that two-stage firms' discretionary current accruals are not significantly different from the U.S. conventional samples; they are even significantly higher than the Chinese conventional IPOs. We explain that China's IPO process results in the lower discretionary current accruals for the Chinese conventional IPOs. The insignificant difference in discretionary current accruals between two-stage firms and the U.S. conventional IPOs is likely the result of IPO market tradition. When the U.S. conventional IPOs aggressively use earnings management prior to the IPO, two-stage firms simply follow suit. The two-stage firms' management may be concerned that if they do not

do so, investors may consider their firms inferior to the conventional IPOs. This may have a negative impact on two-stage firms' IPO valuation.

In Table 2.4, we use univariate analysis to test the impact of two binomial variables on earnings management. In Panel A, we divide two-stage firms into two sub-groups: one with follow-up equity offerings within three years of IPO, and the other without. We find that in the year prior to the IPO (*t-1*), the discretionary current accruals for the two-stage firms with follow-up equity offerings are 0.112 to 0.141 higher than those without. The difference of 0.141 is statistically significant. This result indicates that if a two-stage firm would issue a follow-up equity offering, it tends to begin using aggressive earnings management one year earlier than those who don't issue follow-up equity offerings. But during the IPO year (*t*), the difference in discretionary current accruals drops to an insignificant level of 0.026 and 0.003. It suggests that two-stage firms use a similar level of earnings management in IPO year, no matter whether or not they issue a follow-up offering.

In Panel B, our first sub-group includes the two-stage firms that have committed fraud within three years of the IPO. The second sub-group includes the two-stage firms without an incidence of fraud. We find that the first sub-group has lower discretionary current accruals one year prior to the IPO (*t-1*) and higher discretionary current accruals during the IPO year (*t*). The difference between the two sub-samples ranges from -0.031 to 0.013 and is not statistically significant. This result indicates that the degree of earnings management prior to IPO is not associated with the incidences of fraud during the post-IPO years. This finding is

not consistent with Ang et al. (2014) who argued that fraud committed by U.S.-listed Chinese firms are a result of their aggressive use of earnings management.

In Table 2.5, we use linear regression models to perform multivariate analysis. The independent variables in these models include audit quality (*Audit*), CEO-Chairman duality (*Duality*), largest shareholder ownership (*Ownership*) and time interval between listing and IPO (*Time*). The dependent variables are discretionary current accruals relative to the two different benchmark indexes and in two time periods prior to the IPO. First, we find positive regression coefficients for *Audit* in all the four models, indicating that the two-stage firms with lower audit quality tend to have lower discretionary current accruals. However, this effect is very weak as the coefficients for *Audit* are not statistically significant. Secondly, the regression coefficients for *Duality* are negative but not statistically significant in Model A, Model B and Model D. It is only marginally significant in Model C. This result indicates that the separation of CEO and Chairman roles in two-stage firms doesn't reduce discretionary current accruals prior to the IPO. Thirdly, the negative regression coefficients for *Ownership* are statistically significant in Model B and Model D. It shows that largest shareholder ownership is associated with lower discretionary current accruals during the IPO year. Lastly, the regression coefficients for *Time* are negative and statistically significant in all four models. This result indicates a negative correlation between the length of trading history and discretionary current accruals; it also supports our Hypothesis 2.2 in that the two-stage firms with longer time intervals between listing and IPO have lower discretionary current accruals.

Given that we find positive evidence on two-stage firms' earnings management prior to the IPO, we test the correlation between earnings management and two-stage firms' valuation. This is in reference to the value relevance hypothesis that we have previously discussed. In Table 2.6, we use the same linear regression models as DuCharme et al. (2001). In these models, the dependent variables are firm value on the IPO day, adjusted for total assets. The independent variables include operating cash flow (*CFO*), sales growth (*SG*), audit quality (*Audit*) and discretionary current accruals (*DCA_SH* and *DCA_RU*). We find a significant positive regression coefficient of 0.960 for *DCA_SH t* in Model A, indicating that higher discretionary current accruals relative to the Shanghai Stock Exchange A Share Index during the IPO year would lead to higher valuation for two-stage firms. This finding is consistent with the value relevance hypothesis in that earnings management has a positive impact on IPO firm valuation. On the other hand, when we use *DCA_RU* in Model B, the regression coefficients are insignificant, suggesting that the discretionary current accruals relative to the Russell 2000 Index does not have a significant impact on two-stage firms' IPO valuation.

In Table 2.7, we test the disappointment hypothesis. Our purpose is to test the impact of earnings management on two-stage firms' operating performance and stock market performance during the post-IPO years. In Panel A, the independent variables are operating return on assets in the third year of IPO (*t+3*). The results show that regression coefficients for *DCA_SH* and *DCA_RU* in both of the models are insignificant. This is consistent with the findings in Ang el al. (2012) in that earnings management prior to IPO is not correlated with the operating performance in post-IPO period. We argue that because earnings

management only affects a firm's reported earnings instead of the firm's quality, there is no impact on its operating performance in the long term.

In Panel B, we test the impact of earnings management on stock market performance. The independent variables are the three-year cumulative buy-and-hold abnormal returns relative to the two benchmark indexes, namely the Shanghai Stock Exchange A Share Index and the Russell 2000 Index. Note that these abnormal returns are only adjusted for market risk and not for firm-specific characteristics. We find that the regression coefficients for *NDCA_SH* and *NDCA_RU* are insignificantly different from zero, indicating that the nondiscretionary current accruals don't have an impact on stock market performance during the post-IPO years. The significantly negative regression coefficients of -0.707 and -0.906 for *DCA_RU t-1* and *DCA_RU t* imply a negative correlation between the pre-IPO earnings management and post-IPO stock market performance. That is, higher discretionary current accruals prior to the IPO lead to lower stock market performance during the post-IPO period. This finding supports the disappointment hypothesis and our Hypothesis 2.3 in that the two-stage firms with higher discretionary current accruals during the pre-IPO period have lower stock market performance in the post-IPO period.

With the Carhart four-factor model, we adjust two-stage firms' stock market performance for both market risk and firm-specific characteristics, including size, book-to-price ratio and return momentum.[51] In Panel C, we use the alphas in Carhart's four-factor model as the

[51] Kenneth R. French and Stefano Marmi use the same approach to develop momentum factors. Kenneth R. French reports the factor for the U.S. stock market while Stefano Marmi reports the factor for the Chinese stock market. Detailed discussion on the approach to measure return momentum is in Carhart (1997).

dependent variables. They are an indicator of two-stage firms' risk-adjusted performance. We find that the regression coefficients for *DCA_RU t-1* and *DCA_RU t* are -0.036 and -0.070, respectively. Both of them are statistically significant. Once again, the result shows that higher discretionary current accruals prior to IPO lead to lower stock market performance during the post-IPO period. This is consistent with the results in Panel B and supports the disappointment hypothesis and our Hypothesis 2.3.

Fraud

As we discussed in the literature review section, Ang et al. (2014) argued that fraud is the result of a firm's aggressive use of earnings management. However, we don't find any significant correlation between earnings management and fraud in the logistic regression models in Table 2.8. In Model A and Model B, the regression coefficients for *DCA_SH* and *DCA_RU* are not statistically significant. It indicates that two-stage firms' acts of fraud are not associated with the aggressive use of earnings management. In Model C, we keep *Fraud* as the dependent variable, but add underwriter reputation (*Underwriter*), largest shareholder ownership (*Ownership*) and trustworthiness ranking (*Trust*) as independent variables. We find that their regression coefficients are also insignificant. We notice that the regression coefficients for *Duality* are 1.539 in Model A, 1.544 in Model B and 1.548 in Model C. Most importantly, these coefficients are statistically significant. They indicate that the two-stage firms with CEO and Chairman duality are more likely to commit fraud.

Auditor Choice

Next, we test the variables that may have had an impact on two-stage firms' choice of auditor. In the linear regression model in Table 2.9, the independent variables includes firms' market capitalization on the IPO day (*Size*), largest shareholder ownership (*Ownership*), CEO-Chairman duality (*Duality*) and trustworthiness ranking of the firm's headquarter location (*Trust*). The dependent variable is audit quality measured with the four-tier framework developed by Ang et al. (2014). The insignificant regression coefficient of -0.682 for *Ownership* indicates that largest shareholder ownership does not have a significant impact on a two-stage firm's choice of auditor. The result does not support our Hypothesis 2.4 that predicts that two-stage firms with higher shareholder ownership are more likely to hire low-quality auditors. We explain that when it comes to choosing an auditor, the largest shareholders need to evaluate the trade-off between the private benefits from hiring low-quality auditors, and the potential stock price appreciation due to the positive signaling effect of hiring high-quality auditors. As the optimization varies for each individual largest shareholder, we are not able to find any conclusive results. Thus, the regression coefficient for *Ownership* in our regression model is insignificant.

Also in Table 2.9, the regression coefficient for *Duality* is 0.384 and is statistically significant. It indicates a positive correlation between CEO-Chairman duality and auditor choice. If a two-stage firm doesn't separate CEO and Chairman roles, it is likely to choose a high-quality auditor. This result doesn't support our Hypothesis 2.5 that predicts the two stage firms with CEO-Chairman duality are more likely to hire low-quality auditors. Moreover, the significant regression coefficient of 0.017 for *Trust* indicates that when a two-

stage firm's headquarters is located in an untrustworthy province or territory, it is also likely that it will hire a high-quality auditor. Combining the findings on CEO-Chairman duality and trustworthiness ranking, we argue that two-stage firms may be fully aware of the signaling effect of the two variables. When they have not separated the CEO and Chairman roles or they are located in an untrustworthy province or territory, they hire high-quality auditors to signal the reliability of their financial statements.

Lastly, we test the impact of auditor choice on IPO underpricing. In the linear regression model in Table 2.10, the dependent variable is IPO underpricing. The independent variables include market capitalization on IPO day (*Size*), largest shareholder ownership (*Ownership*) and audit quality (*Audit*). We find that the regression coefficient for *Audit* is 0.023, indicating that higher audit quality leads to higher IPO underpricing. However, it is not statistically significant. Overall, the result supports our Hypothesis 2.6 in that two-stage firms' auditor choice doesn't have a significant impact on IPO underpricing.

Conclusions

In this essay, we report two-stage firms' earnings management around the time of their IPO and compare this with the control sample of conventional IPOs. We find that two-stage firms demonstrate a higher degree of earnings management than the Chinese conventional IPOs, and a similar degree compared to the U.S. conventional IPOs. By investigating the impact of earnings management on two-stage firms' valuation, we find our evidence supports both the value relevance hypothesis and the disappointment hypothesis. The two-stage firms with a

higher degree of earnings management during the pre-IPO period tend to have higher firm valuation during the IPO and lower stock market performance during the post-IPO period. With further investigation, we find that the degree of earnings management during the pre-IPO period does not correlate with two-stage firms' incidences of fraud during the post-IPO period. The only variable that can predict fraud is CEO-Chairman duality. Moreover, the two-stage firms located in an untrustworthy province or territory and with CEO-Chairman duality are more likely to hire high-quality auditors. However, auditor choice doesn't have a significant impact on two-stage firms' valuation during the IPO. Overall, our study provides empirical evidence on two-stage firms' earnings management, incidence of fraud and choice of auditor. It provides security regulators with insightful information on predicting a firm's likelihood of committing fraudulent acts as well.

Table 2.1 Definitions of Variables

Variable	Name	Description	Data Source
Ctrl_CHN_ MarketCap	Control Sample of Chinese Domestic IPOs - Market Capitalization Matching	This control sample of Chinese conventional IPOs matches the two-stage firm sample with two-digit SIC code and market capitalization on IPO day.	Bloomberg
Ctrl_CHN_P roceeds	Control Sample of Chinese Domestic IPOs - Gross Proceeds Matching	This control sample of Chinese conventional IPOs matches the two-stage firm sample with two-digit SIC code and IPO gross proceeds.	Bloomberg
Ctrl_US_Ma rketCap	Control Sample of U.S. Domestic IPOs - Market Capitalization Matching	This control sample of U.S. conventional IPOs matches the two-stage firm sample with two-digit SIC code and market capitalization on IPO day.	Bloomberg
Ctrl_US_Pro ceeds	Control Sample of U.S. Domestic IPOs - Gross Proceeds Matching	This control sample of U.S. conventional IPOs matches the two-stage firm sample with two-digit SIC code and IPO gross proceeds.	Bloomberg
DCA_RU	Discretionary Current Accruals relative to Russell 2000 Index	This variable measures the degree of earnings management; it is calculated based on the modified Jones model in Dechow et al. (1995); the benchmark index is Russell 2000 Index.	Capital IQ; Thomson Reuters
DCA_SH	Discretionary Current Accruals relative to Shanghai Stock Exchange A Share Index	This variable measures the degree of earnings management; it is calculated based on the modified Jones model in Dechow et al. (1995); the benchmark index is Shanghai Stock Exchange A Share Index.	Capital IQ; Thomson Reuters
NDCA_RU	Non-discretionary Current Accruals relative to Russell 2000 Index	This variable measures the change in accruals that a firm's management is not able to manipulate. It is calculated based on the modified Jones model in Dechow et al. (1995); the benchmark index is Russell 2000 Index.	Capital IQ; Thomson Reuters

Table 2.1 Definitions of Variables (Cont'd)

Variable	Name	Description	Data Source
NDCA_SH	Non-discretionary Current Accruals relative to Shanghai Stock Exchange A Share Index	This variable measures the change in accruals that a firm's management is not able to manipulate. It is calculated based on the modified Jones model in Dechow et al. (1995); the benchmark index is Shanghai Stock Exchange A Share Index.	Capital IQ; Thomson Reuters
Size	Firm Size	Natural logarithm of Market Capitalization on IPO day	Capital IQ
Fraud	Fraudulent Act	This is a dummy variable; it equals 1 if a two-stage firm is prosecuted or suspected for fraudulent acts within three years of IPO, and 0 otherwise.	LexisNexis
Underwriter	Underwriter Reputation	This is an ordinal variable; it uses a scale from one to nine to measure the reputation of IPO underwriter. One represents the lowest reputation; nine represents the highest reputation. The data is obtained from Jay Ritter's database.	Jay Ritter's database[52]
Audit	Audit Quality	We use the size of an audit firm as a proxy for audit quality. This variable is measured with the four-tier framework in Ang et al. (2014).	LexisNexis; www.vault.com;
Time	Time Interval between Listing and IPO	The number of months between a two-stage firm's backdoor listing and IPO.	LexisNexis
Follow-Up	Follow-Up Equity Offering	This is a dummy variable; it equals 1 if a two-stage firm conducts follow-up equity offering within three years of IPO, and 0 otherwise.	Capital IQ; Thomson Reuters
Ownership	Largest Shareholder Ownership	The percentage ownership of the largest shareholder of a two-stage firm on IPO day.	Capital IQ; EDGAR
Duality	CEO-Chairman Duality	This is a dummy variable; it equals 1 if CEO and Chairman is one person, and 0 otherwise.	LexisNexis; Capital IQ

[52] https://site.warrington.ufl.edu/ritter/ipo-data/

Table 2.1 Definitions of Variables (Cont'd)

Variable	Name	Description	Data Source
Trust	Trust Worthiness Ranking of a Firm's Headquarter Location	The trustworthiness ranking of the provinces/territories where a two-stage firm's headquarter is located. The ranking is reported by Zhang and Ke (2002)	Zhang and Ke (2002)
CFO	Operating Cash Flow	This variable is measured in percentage. It is the operating cash flow divided by total assets.	Capital IQ; Thomson Reuters
SG	Sales Growth	This variable is measured in percentage. It is the change in net sales.	Capital IQ; Thomson Reuters
Operating_ROA	Operating Return on Assets	Operating profit divided by total assets.	Capital IQ; Thomson Reuters
Alpha_RU	Alpha in the Carhart four-factor model with U.S. factors	This is the intercept term of a linear regression. The independent variables are market risk, size, book-to-market ratio and momentum. The factors are obtained from Kenneth French's website; the independent variable is a firm's stock market return.	Kenneth French's database[53]; Capital IQ; Thomson Reuters
Alpha_SH	Alpha in the Carhart four-factor model with Chinese factors	This is the intercept term of a linear regression. The independent variables are market risk, size, book-to-market ratio and momentum. The factors are obtained from Stefano Marmi's website; the independent variable is a firm's stock market return.	Stefano Marmi's database[54]; Capital IQ; Thomson Reuters
BHAR_RU	Buy-and-Hold Abnormal Return relative to Russell 2000 Index	This variable measures the cumulative excess investment return relative to Russell 2000 Index.	Capital IQ; Thomson Reuters
BHAR_SH	Buy-and-Hold Abnormal Return relative to Shanghai Index	This variable measures the cumulative excess investment return relative to Shanghai Stock Exchange A Share Index.	Capital IQ; Thomson Reuters

[53] http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/
[54] http://homepage.sns.it/marmi/Data_Library.html

Table 2.2 Discretionary Current Accruals (DCA)

We use the discretionary current accruals as a proxy of the degree of firm's earnings management. It measures the extent to which a firm's management can manipulate the report earnings. In this study, the discretionary current accruals are calculated with Teoh et al. (1998).

Panel A Discretionary Current Accruals relative to Shanghai Stock Exchange A Share Index

The discretionary current accruals are calculated relative to the Chinese seasonal firms listed in the Shanghai Stock Exchange A Share Index. The discretionary current accruals are calculated with Teoh et al. (1998). *Ctrl_CHN_Proceeds* refers to the Chinese conventional IPOs with gross proceeds matching. *Ctrl_CHN_MarketCap* refers to the Chinese conventional IPOs with market capitalization matching. t-1 refers to the time period one-year prior to IPO. t refers to the IPO year. t+1 refers to the time period one-year after IPO. t+2 refers to the time period two years after IPO. t+3 refers to the time period three years after IPO.

	Two-Stage Firms			**Two-Stage Firms vs. *Ctrl_CHN_Proceeds***			**Two-Stage Firms vs. *Ctrl_CHN_MarketCap***		
	N	mean	p-value	N	mean	p-value	N	mean	p-value
t-1	63	0.109	0.003***	61	0.114	0.005***	60	0.100	0.015**
t	64	0.191	0.000***	63	0.157	0.000***	64	0.173	0.000***
t+1	57	0.089	0.000***	57	0.068	0.013**	57	0.065	0.008***
t+2	46	0.105	0.000***	45	0.088	0.004***	46	-0.072	0.008***
t+3	36	0.031	0.439	36	0.041	0.365	36	0.035	0.377

*** significant at 1%, ** significant at 5%, * significant at 10%.

Panel B Discretionary Current Accruals relative to Russell 2000 Index

The discretionary current accruals are calculated relative to the U.S. seasonal firms listed in the Russell 2000 Index. The discretionary current accruals are calculated with Teoh et al. (1998). *Ctrl_US_Proceeds* refers to the U.S. conventional IPOs with gross proceeds matching. *Ctrl_US_MarketCap* refers to the U.S. conventional IPOs with market capitalization matching. *t-1* refers to the time period one-year prior to IPO. *t* refers to the IPO year. *t+1* refers to the time period one-year after IPO. *t+2* refers to the time period two years after IPO. *t+3* refers to the time period three years after IPO.

	Two-Stage Firms			**Two-Stage Firms vs. *Ctrl_US_Proceeds***			**Two-Stage Firms vs. *Ctrl_US_MarketCap***		
	N	mean	p-value	N	mean	p-value	N	mean	p-value
t-1	63	0.028	0.410	52	-0.044	0.552	42	0.092	0.094*
t	64	0.115	0.000***	60	0.046	0.240	52	0.080	0.073*
t+1	57	0.045	0.134	55	0.011	0.749	48	0.029	0.419
t+2	46	-0.085	0.308	44	-0.033	0.715	39	-0.093	0.345
t+3	36	-0.074	0.121	33	-0.123	0.154	31	-0.106	0.058*

*** significant at 1%, ** significant at 5%, * significant at 10%.

Table 2.3 Comparison between Two-Stage Firms and Control Samples of Conventional IPOs

We use logistic regression models in this table. The dependent variable is equal to 1 if an observation is a two-stage firm, 0 if the observation is a conventional IPO. *Ctrl_CHN_Proceeds* refers to the Chinese conventional IPOs with gross proceeds matching. *Ctrl_CHN_MarketCap* refers to the Chinese conventional IPOs with market capitalization matching. *Ctrl_US_Proceeds* refers to the U.S. conventional IPOs with gross proceeds matching. *Ctrl_US_MarketCap* refers to the U.S. conventional IPOs with market capitalization matching. *Size* is the market capitalization on IPO day. *Fraud* is a dummy variable equal to 1 if a firm is accused or suspected of fraud, 0 if not. *DCA_SH* is the discretionary current accruals relative to the Shanghai Stock Exchange A Share Index. *DCA_RU* is the discretionary current accruals relative to the Russell 2000 Index. *t-1* refers to the time period one-year prior to IPO. *t* refers to the IPO year.

	Model A		**Model B**		**Model C**		**Model D**	
	Two-Stage Firms vs. *Ctrl_CHN_Proceeds*		**Two-Stage Firms vs. *Ctrl_CHN_MarketCap***		**Two-Stage Firms vs. *Ctrl_US_Proceeds***		**Two-Stage Firms vs. *Ctrl_US_MarketCap***	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
Constant	-2.821	0.029**	0.255	0.867	0.027	0.980	6.214	0.000***
Size	0.497	0.054*	-0.153	0.608	-0.052	0.813	-1.200	0.000***
Fraud					0.440	0.459	0.344	0.400
DCA_SH t-1	1.671	0.099*	1.199	0.235				
DCA_SH t	3.064	0.017**	5.89	0.000***				
DCA_RU t-1					-0.217	0.675	0.788	0.348
DCA_RU t					0.697	0.252	1.286	0.187
N	142		142		142		142	
Chi Square	20.055	0.000***	24.755	0.000***	2.405	0.662	22.455	0.000***

*** significant at 1%, ** significant at 5%, * significant at 10%.

Table 2.4 Impact of Binomial Variables on Earnings Management

This is a univariate analysis on the impact of follow-up equity offering and fraud on earnings management. We use discretionary current accruals, or *DCA*, as a proxy for a firm's earnings management. It is calculated based with Teoh et al. (1998).

Panel A Follow-UP Equity Offering and Earnings Management

Follow-up equity offering is investigated within three years after a two-stage firm's IPO. *DCA_SH* is the discretionary current accruals relative to the Shanghai Stock Exchange A Share Index. *DCA_RU* is the discretionary current accruals relative to the Russell 2000 Index. *t-1* refers to the time period one-year prior to IPO. *t* refers to the IPO year.

	N	***DCA_SH***		***DCA_RU***	
		mean	p-value	mean	p-value
Time Period = t-1					
1. Yes	23	0.199	0.000***	0.100	0.093*
2. No	40	0.057	0.241	-0.012	0.771
Diff (1 - 2)		0.141	0.038**	0.112	0.117
Time Period = t					
1. Yes	23	0.208	0.003***	0.118	0.006***
2. No	41	0.182	0.000***	0.114	0.000***
Diff (1)–(2)		0.026	0.688	0.003	0.942

*** significant at 1%, ** significant at 5%, * significant at 10%.

Panel B Fraud and Earnings Management

Fraud is investigated within three years after a two-stage firm's IPO. *DCA_SH* is the discretionary current accruals relative to the Shanghai Stock Exchange A Share Index. *DCA_RU* is the discretionary current accruals relative to the Russell 2000 Index. *t-1* refers to the time period one-year prior to IPO. *t* refers to the IPO year.

	N	***DCA_SH***		***DCA_RU***	
		mean	p-value	mean	p-value
Time Period = t-1					
1. Yes	29	0.092	0.102	0.044	0.444
2. No	34	0.124	0.014**	0.015	0.719
Diff (1 - 2)		-0.031	0.664	-0.028	0.680
Time Period = t					
1. Yes	29	0.191	0.000***	0.123	0.000***
2. No	35	0.191	0.000***	0.109	0.004***
Diff (1)–(2)		0.000	0.991	0.013	0.777

*** significant at 1%, ** significant at 5%, * significant at 10%.

Table 2.5 Impact of Continuous Variables on Earnings Management

We use linear regression models in this model. *DCA_SH* is the discretionary current accruals relative to the Shanghai Stock Exchange A Share Index. *DCA_RU* is the discretionary current accruals relative to the Russell 2000 Index. *t-1* refers to the time period one-year prior to IPO. *t* refers to the IPO year. *Audit* is the audit quality of a firm; it is based on the four-tier framework developed by Ang et al. (2014). *Duality* is CEO-Chairman duality; it is equal to 1 if one person assumes both CEO and Chairman roles in a firm, 0 if not. *Ownership* is largest shareholder ownership. *Time* is the time interval between backdoor listing and IPO.

	DCA_SH				***DCA_RU***			
	Model A: *t-1*		**Model B: *t***		**Model C: *t-1***		**Model D: *t***	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
Constant	0.353	0.110	0.468	0.019**	0.184	0.370	0.370	0.015**
Audit	0.021	0.704	0.034	0.502	0.067	0.200	0.010	0.800
Duality	-0.083	0.426	-0.039	0.673	-0.162	0.099*	-0.001	0.993
Ownership	-0.103	0.616	-0.415	0.038**	-0.089	0.641	-0.391	0.011**
Time	-0.006	0.009***	-0.005	0.007***	-0.004	0.031**	-0.004	0.006***
N	57		58		57		58	
R Square	0.135	0.098*	0.175	0.032**	0.147	0.072*	0.189	0.022**

*** significant at 1%, ** significant at 5%, * significant at 10%.

Table 2.6 Value Relevance Hypothesis

We use linear regression models in this model. Firm value is the ratio a firm's market capitalization relative to total assets. *DCA_SH* is the discretionary current accruals relative to the Shanghai Stock Exchange A Share Index. *DCA_RU* is the discretionary current accruals relative to the Russell 2000 Index. *t-1* refers to the time period one-year prior to IPO. *t* refers to the IPO year. *Audit* is the audit quality of a firm; it is based on the four-tier framework developed by Ang et al. (2014). *CFO* is operating cash flow. *SG* is sales growth.

	Firm Value			
	Model A		**Model B**	
	Coefficient	p-value	Coefficient	p-value
Constant	1.080	0.023**	1.175	0.013**
CFO t-1	0.519	0.406	0.492	0.425
SG t-1	-0.031	0.663	0.026	0.715
Audit	-0.004	0.983	-0.024	0.887
DCA_SH t-1	0.238	0.576		
DCA_SH t	0.960	0.042**		
DCA _RU t-1			0.674	0.132
DCA_RU t			0.993	0.116
N	56		56	
R Square	0.128	0.206	0.154	0.119

*** significant at 1%, ** significant at 5%, * significant at 10%.

Table 2.7 Disappointment Hypothesis

We use linear regression models in this model. We test the disappointment hypothesis. The dependent variables are operating return on assets, buy-and-hold abnormal return and the alpha in Carhart four-factor model.

Panel A Disappointment Hypothesis – Operating Return on Assets

Operating return on assets, or *Operating ROA*, is calculated in the third year after a two-stage firm's IPO. *DCA_SH* is the discretionary current accruals relative to the Shanghai Stock Exchange A Share Index. *DCA_RU* is the discretionary current accruals relative to the Russell 2000 Index. *NDCA_SH* is the nondiscretionary current accruals relative to the Shanghai Stock Exchange A Share Index. *NDCA_RU* is the nondiscretionary current accruals relative to the Russell 2000 Index. *t-1* refers to the time period one-year prior to IPO. *t* refers to the IPO year.

	Operating_ROAt+3		***Operating_ROA t+3***	
	Coefficient	p-value	Coefficient	p-value
Constant	0.120	0.647	0.030	0.267
DCA _SH t-1	0.148	0.120		
DCA_ SH t	-0.118	0.390		
NDCA_SH t-1	-0.019	0.226		
NDCA_SH t	-0.114	0.751		
DCA_RU t-1			0.153	0.110
DCA_RU t			-0.090	0.517
NDCA_RU t-1			0.041	0.653
NDCA_RU t			0.152	0.728
N	31		32	
R Square	0.098	0.577	0.101	0.543

*** significant at 1%, ** significant at 5%, * significant at 10%.

Panel B Disappointment Hypothesis – Buy-and-Hold Abnormal Return

The dependent variables are the buy-and-hold abnormal returns that are three-year cumulative returns after a two-stage firm's IPO and adjusted for Shanghai Stock Exchange A Share Index and Russell 2000 Index, respectively. *DCA_SH* is the discretionary current accruals relative to the Shanghai Stock Exchange A Share Index. *DCA_RU* is the discretionary current accruals relative to the Russell 2000 Index. *NDCA_SH* is the nondiscretionary current accruals relative to the Shanghai Stock Exchange A Share Index. *NDCA_RU* is the nondiscretionary current accruals relative to the Russell 2000 Index. *t-1* refers to the time period one-year prior to IPO. *t* refers to the IPO year.

	BHAR_SH (t, t+3)		***BHAR_RU (t, t+3)***	
	Coefficient	p-value	Coefficient	p-value
Constant	-0.448	0.000***	-0.916	0.000***
DCA _SH t-1	0.244	0.383		
DCA_ SH t	-0.533	0.169		
NDCA_SH t-1	-0.027	0.646		
NDCA_SH t	-0.627	0.429		
DCA_RU t-1			-0.707	0.014**
DCA_RU t			-0.906	0.035**
NDCA_RU t-1			0.079	0.251
NDCA_RU t			0.795	0.538
N	57		58	
R Square	0.04	0.696	0.151	0.061*

*** significant at 1%, ** significant at 5%, * significant at 10%.

Panel C Disappointment Hypothesis – Carhart Four-Factor Alpha

The dependent variables, *Alpha_SH* and *Alpha_RU* are the Carhart four-factor alphas calculated with Chinese factors and U.S. factors within three years of IPO. *DCA_SH* is the discretionary current accruals relative to the Shanghai Stock Exchange A Share Index. *DCA_RU* is the discretionary current accruals relative to the Russell 2000 Index. *NDCA_SH* is the nondiscretionary current accruals relative to the Shanghai Stock Exchange A Share Index. *NDCA_RU* is the nondiscretionary current accruals relative to the Russell 2000 Index. *t-1* refers to the time period one-year prior to IPO. *t* refers to the IPO year.

	Alpha_SH (t, t+3)		***Alpha_RU (t, t+3)***	
	Coefficient	p-value	Coefficient	p-value
Constant	-0.020	0.014**	-0.035	0.000***
DCA _SH t-1	0.024	0.329		
DCA_ SH t	-0.053	0.121		
NDCA_SH t-1	-0.002	0.679		
NDCA_SH t	-0.073	0.303		
DCA_RU t-1			-0.036	0.066*
DCA_RU t			-0.070	0.018**
NDCA_RU t-1			0.005	0.297
NDCA_RU t			0.077	0.387
N	57		59	
R Square	0.051	0.587	0.133	0.092*

*** significant at 1%, ** significant at 5%, * significant at 10%.

Table 2.8 Impact of Variables on Fraud

We use logistic regression models in this table. *DCA_SH* is the discretionary current accruals relative to the Shanghai Stock Exchange A Share Index. *DCA_RU* is the discretionary current accruals relative to the Russell 2000 Index. *t-1* refers to the time period one-year prior to IPO. *t* refers to the IPO year. *Audit* is the audit quality of a firm; it is based on the four-tier framework developed by Ang et al. (2014). *Duality* is CEO-Chairman duality; it is equal to 1 if one person assumes both CEO and Chairman roles in a firm, 0 if not. *Ownership* is largest shareholder ownership. *Underwriter* is underwriter reputation obtained from Jay Ritter's database. *Trust* is the trustworthiness ranking developed in Zhang and Ke (2002).

	Fraud					
	Model A		**Model B**		**Model C**	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
Constant	-1.206	0.397	-1.031	0.463	0.178	0.916
Audit	-0.016	0.973	-0.029	0.950	-0.783	0.103
Duality	1.539	0.086*	1.544	0.087*	1.548	0.060*
Underwriter					0.095	0.545
Ownership					0.083	0.959
Trust					0.039	0.336
DCA _SH t-1	1.505	0.173				
DCA_ SH t	-0.832	0.516				
DCA_RU t-1			0.751	0.490		
DCA_RU t			-1.401	0.374		
N	57		57		60	
Chi Square	4.985	0.289	3.915	0.418	7.556	0.272

*** significant at 1%, ** significant at 5%, * significant at 10%.

Table 2.9 Impact of Variables on Auditor Choice

We use linear regression models in this model. We use audit quality as a proxy for auditor choice; it is based on the four-tier framework developed by Ang et al. (2014). *Duality* is CEO-Chairman duality; it is equal to 1 if one person assumes both CEO and Chairman roles in a firm, 0 if not. *Ownership* is largest shareholder ownership. *Trust* is the trustworthiness ranking developed in Zhang and Ke (2002). *Size* is the market capitalization on IPO day.

	Audit Quality	
	Coefficient	p-value
Constant	3.901	0.000***
Size	-0.280	0.017**
Ownership	-0.672	0.141
Duality	0.384	0.057*
Trust	0.017	0.083*
N	63	
R Square	0.190	0.013**

*** significant at 1%, ** significant at 5%, * significant at 10%.

Table 2.10 Impact of Variables on IPO Underpricing

We use linear regression models in this model. The dependent variable is IPO underpricing; it is calculated as the difference between IPO offer price and issue day closing price, scaled by the issue day closing price. *Size* is the market capitalization on IPO day. *Ownership* is largest shareholder ownership. *Audit* refers to audit quality; it is based on the four-tier framework developed by Ang et al. (2014).

	IPO Underpricing	
	Coefficient	p-value
Constant	-0.144	0.325
Size	0.024	0.27
Ownership	0.031	0.712
Audit	0.023	0.303
N	67	
R Square	0.029	0.593

*** significant at 1%, ** significant at 5%, * significant at 10%.

ESSAY THREE: THE LONG-TERM PERFORMANCE OF TWO-STAGE FIRMS

Abstract

In this essay, we investigate the post-IPO long-term performance of Chinese two-stage firms and test six hypotheses that are developed in the literature to explain the IPO long-term performance. We find that two-stage firms' performances vary across different industries. For instance, firms in the Consumer Discretionary sector tend to demonstrate significant underperformance while those in the Healthcare sector do not. In addition, two-stage firms' IPO initial return tends to be negatively correlated with their performance during the post-IPO period. The two-stage firms with shares buyback demonstrate better performance than those without. But other variables, including underwriter reputation and acquisitions, do not have a significant signalling impact on post-IPO performance. Besides, we do not find any evidence on the deterioration of two-stage firms' operating performance during the post-IPO period. Overall, our findings support the fads hypothesis in terms of the causes of the detected long-term IPO underperformance. We find some results to support the market efficiency, the investment sentiment and the signalling hypotheses. Finally, our findings do not support the faulty risk measurement or the firm quality hypotheses.

While there are many studies on the long-term performance of conventional IPOs,[55] the long-term performance of two-stage firms hasn't been investigated. We expect to find that two-stage firms and conventional IPOs have different results with regards to post-IPO performance. On the one hand, the low IPO cost with a two-stage strategy may allow the extremely risky firms – even the low-quality firms – to raise capital in the public capital market. This would

[55] Through the conventional IPO process, a private firm can achieve public listing and new equity issuance in one single transaction. But with a two-stage strategy, a private firm goes public first, and issue new public equities afterwards. That is, a two-stage strategy uses two separate transactions to achieve public listing and new equity issuance.

cause underperformance relative to the conventional IPOs. On the other hand, because two-stage firm shares are publicly traded prior to the IPO, investors and firm managers should have lower uncertainty in terms of pricing two-stage firms' IPO. In other words, two-stage firms' IPO price may reflect firm value more than the conventional IPOs. Therefore, two-stage firms may demonstrate less underperformance than the conventional IPOs during the post-IPO period. Overall, our expectations are mixed. However the fact that there is no existing empirical evidence to provide reference is motivating us to write this essay. We investigate the issues and answer questions surrounding two-stage firms' post-IPO performance. For example, do two-stage firms outperform or underperform over the long term? How do we explain the post-IPO performance? Are there any variables that can affect, and thus help to predict two-stage firms' long-term performance? In this regard, we use six performance benchmarks, two return calculation methods and two portfolio construction approaches[56] to test six hypotheses[57] associated with post-IPO long-term performance. We also compare two-stage firms' stock market and operating performance to the control samples of conventional IPOs. For the rest of this essay, we use the term "long-term performance/underperformance" to refer to a firm's long-term stock market performance. When investigating the operating performance, we use the term "operating performance." In addition, two-stage firms' operating businesses are in China, so we focus on comparing them with the Chinese benchmarks (market index and matching firms). We use the U.S. benchmarks for robustness testing purposes.

[56] In our study, the two portfolio construction approaches are event-study portfolio and calendar-time portfolio. Event-time portfolio does not take into account a two-stage firm's IPO issue date; it includes all the two-stage firms at the same time. Calendar-time portfolio is essentially a time series portfolio; two-stage firms enter into this portfolio based on the sequence of their IPO issue date.

[57] Specifically, the six hypotheses are the faulty risk measurement hypothesis, the investor sentiment hypothesis, the market efficiency hypothesis, the firm quality hypothesis, the signalling hypothesis and the fads hypothesis.

In this study, four of the six hypotheses are tested with event-study portfolios. One hypothesis is tested with both an event-study portfolio and a calendar-time portfolio. Also, one hypothesis is tested with two-stage firms' operating performance. Our event-study portfolio shows that two-stage firms underperform the control samples by 50.96% to 99.15% in three post-IPO years. These firms also have significantly negative alphas in the Carhart four-factor model. In addition, we find that two-stage firms' underperformance is not affected by the selection of performance measurement models or benchmarks. This is inconsistent with the faulty risk measurement hypothesis, which argues that the detected IPO underperformance is caused by the inappropriate use of benchmarks and models. On the other hand, when we use a calendar-time portfolio, we don't find any significant underperformance. This indicates that the conclusions on two-stage firms' long-term performance are dependent on portfolio construction approaches. Moreover, we find two-stage firms have different long-term performance across different industries. For instance, there is significant underperformance in the Consumer Discretionary sectors, but not in the Healthcare sector. This result is consistent with the fads hypothesis, which asserts that the long-term IPO underperformance is driven by the fads in specific industries. We also find that two-stage firms' IPO initial return is positively correlated with their long-term underperformance during the post-IPO period. The result is consistent with the market efficiency hypothesis and the investment sentiment hypothesis, which suggests that investor sentiment leads to the over-valuation of IPO shares. When the market corrects this over-valuation, IPO share prices incline, causing the detected IPO underperformance. Our tests on the signaling hypothesis also show that CEO-Chairman duality and share buyback are significantly correlated with two-stage firms' long-term

performance during the post-IPO period. Lastly, we find that when comparing their operating performance to that of conventional IPOs, two-stage firms demonstrate lower profitability but higher debt paying ability. They also have higher inventory turnover ratio but lower total assets turnover ratio. There is no difference in liquidity measures. We do not find any overwhelming evidence demonstrating two-stage firms show deterioration in operating performance during the post-IPO period. Thus our results are not consistent with the firm quality hypothesis, which asserts that the long-term IPO underperformance is driven by the quality of an IPO firm. Overall, our findings support the fads hypothesis, market efficiency hypothesis, investment sentiment hypothesis and signaling hypothesis with respect to the causes of long-term IPO underperformance. However, they don't support the faulty risk measurement hypothesis or the firm quality hypothesis.

The organization of this essay is as follows: previous studies on the post-IPO performance of firms and backdoor listing firms are reviewed in the next section. Then we discuss our six hypotheses and the research methodology we use to test these hypotheses. Next we report our empirical results and provide discussions with regard to the results of our hypothesis testing. Finally, we provide a short summary to conclude this essay.

Literature Review

As there are no studies specifically investigating the operating performance and stock market performance of the Chinese two-stage firms in the U.S., we review the existing studies on the performance of Chinese and U.S. conventional IPOs. In addition, since two-stage firms go

public through backdoor listing, we review the existing studies on the performance of the U.S. and Canadian domestic backdoor listing firms as well.

Underperformance of Conventional IPOs

The U.S. conventional IPOs reportedly have long-term stock market and operating underperformance (Ritter, 1991; Loughran and Ritter, 1995; Jain and Kini, 2003). Researchers have developed six hypotheses to explain the IPO underperformance. Our review of the six hypotheses is as follows. A summary of the key features of the six hypotheses is provided in Table 3.1. As seen, some of these hypotheses overlap from an empirical perspective. For example, the evidence of the negative correlation between IPO initial return and long-term stock market underperformance supports both investor sentiment and market efficiency hypotheses. Our detailed review of the six hypotheses is as follows.

Faulty Risk Measurement Hypothesis

This hypothesis claims that the results about firm performance are significantly affected by the selection of research methodology. More specifically, it is argued that studies reveal long-term IPO underperformance because they do not adjust for the proper risk factors. For example, Loughran and Ritter (1995) argued that because firm size and book-to-market ratio play important roles in a firm's decision with regards to the IPO, comparing performance without controlling for these two factors would generate biased results. Gompers and Lerner (2003) found that the IPO underperformance only exists in the value-weighted abnormal returns; the equal-weighted abnormal returns and the alphas in Fama-French model are not significantly different from zero. Alvarez and Gonzalez (2005) found that the long-term IPO

underperformance disappears after adjusting for firm-specific characteristics. Ritter (1991) found that after controlling for the size effect, the long-term IPO underperformance declines from 3.8% per year to 2.2% per year.

Fads Hypothesis

This hypothesis claims that the detected long-term IPO underperformance is driven by certain industries instead of the whole IPO sample. Investor's over-optimism towards a specific industry causes the short-term over-valuation and long-term underperformance for the IPOs in that industry. Ritter (1991) found that IPO firm's performances vary across different industries, which supports the fads hypothesis. Allen et al. (1999) pointed out that fads are likely to explain the long-term IPO underperformance because (a) IPO firms have high levels of information asymmetry and noise trading, and (b) IPO investors are more speculative and over-optimistic. Alvarez and Gonzalez (2005) argued that since IPO firms that go public during the peak of industry-specific fads often have higher initial returns, they tend to have lower performance in the long term.

Investor Sentiment Hypothesis

This hypothesis claims that when investors evaluate an IPO firm, they often give more weight to recent results, leading to over-optimism. When the over-optimistic investors become disappointed at the IPO firm's performance, the firm's stock return declines. Borges (2007) showed that the IPO firms that were aggressively bought by retail investors are likely to have higher initial returns and lower long-term performance.

Market Efficiency Hypothesis

This hypothesis claims that IPO shares are overvalued in the initial trading period due to investors' over-optimism towards IPOs and the overweight in IPO firms' recent financial data. In an efficient market, the over-valued IPO shares are corrected, resulting in the detected long-term underperformance (Aggarwal et al., 1993; Kooli and Suret, 2004).[58]

Firm Quality Hypothesis

This hypothesis claims that the detected long-term stock market IPO underperformance is driven by their deteriorating operating performance during the post-IPO period. Jain and Kini (1994) and Mikkelson et al. (1997) found significant decline in IPO firms' operating performance in aftermarket years. The authors provided three explanations: (a) the reduction in management ownership increases the agency cost in aftermarket years, (b) the window dressing during pre-IPO years, and (c) the IPO timing to coincide with good performance. Allen et al. (1999) suggested another explanation: when firms decide to go public, they tend to over invest for short-term growth. As a result, the long-term operating performance is negatively affected.

Signalling Hypothesis

This hypothesis claims that some proxy variables have a significant impact on IPO firms, and that these can be viewed as a signal for understanding IPO firms' long-term performance. The literature focuses on four proxy variables: underwriter reputation, CEO-Chairman duality, acquisition, and shares buyback. For example, Crutchley et al. (2002) found that the IPO firms

[58] However, if markets are efficient, it is not clear why IPOs are initially overvalued.

with reputable underwriters tend to demonstrate better performance. Using a top investment banker as an underwriter is a signal of positive aftermarket performance. Li and Naughton (2007) found that the IPOs with voluntary separation of CEO and Chairman positions outperform those without by 26.3% in three aftermarket years. They argued that adopting a dual leadership helps increase the Board's independence from the management and reduces the uncertainty about a firm's intrinsic value. Lyandres et al. (2011) investigated the link between IPO and M&A. They argued that firms conduct IPOs to obtain a valuation. When IPO firm managers notice that their firm's realized post-IPO valuation is higher than the expected post-IPO valuation, they would take advantage of the higher valuation by acquiring the other firms. Therefore, acquisitions after an IPO signal an over-valuation. The firm's share price would decline in a long term due to market correction. Jain et al. (2009) investigated the shares buyback of IPO firms. They reported that 9.6% of firms buy back shares within three years of the IPO. These IPO firms have lower leverage and higher R&D intensity. Shares buyback signals higher growth prospects, thus a better long-term performance for IPO firms.

Studies that focus on the Chinese domestic IPOs also reveal long-term underperformance. Table 3.2 summarizes these results. Overall, the industry-adjusted cumulative abnormal returns indicate an underperformance ranging from -10.6% to -16.2% in three aftermarket years. Bai and Zhang (2004) explained that the underperformance is driven by faulty risk measures. When they used Fama-French model and matching firm samples, they didn't find any evidence of significant long-term underperformance. Liu et al. (2010) found that the underperformance is driven by the non-SOE (SOE: State Owned Enterprises) IPOs. Wang

(2005) reported a significant decline in operating performance during the post-IPO period, supporting the firm quality hypothesis.

There are also studies on the performance of the U.S.-listed Chinese conventional IPOs. Jindra et al. (2014) used CRSP value weighted index as a performance benchmark. They found that the U.S.-listed Chinese conventional IPOs underperform by 75% in three aftermarket years. Luo et al. (2012) investigated the U.S.-listed Chinese conventional IPOs from 1993 to 2011; they found that these IPOs underperform the size and book-to-market matching U.S. domestic firms by only 0.4% in three aftermarket years. The result is statistically significant, but not economically significant. Darrough et al. (2013) studied the IPO performance with two sub samples. They found that the U.S.-listed Chinese conventional IPOs issued before July 2010 are able to outperform the S&P 500 Index by 10.9% in one aftermarket year. However, those issued after July 2010 underperform by 30.8%. They argued that the underperformance of the U.S.-listed Chinese conventional IPOs after July 2010 is driven by the spillover effect of fraud allegations against the Chinese backdoor listing firms.

There are many issues associated with the previous studies that focused on the U.S.-listed Chinese conventional IPOs. First, these studies tend to use inappropriate performance benchmarks to measure IPO performance. For example, the CRSP value weighted index in Jindra et al. (2014) and the S&P 500 Index in Darrough et al. (2013) are broad market indexes, and they do not fully adjust for firm's risk factors, such as size effect or book-to-market ratio. Although Luo et al. (2012) uses matching firms, their sample period doesn't reflect the spillover effect in the post-July 2010 period. More importantly, these studies use the U.S.

performance benchmarks. But many Chinese conventional IPOs only list in the U.S. despite their operating businesses being based in China. Therefore, using the U.S. benchmarks to evaluate the performance of Chinese IPOs may generate biased results. We argue that Chinese performance benchmarks should also be used for the purposes of robustness testing. Secondly, the previous studies don't differentiate conventional IPOs from ADR IPOs or cross-listing firms. For example, Zhang and King (2008) reported that the U.S.-listed Chinese IPOs underperform by -37% to -61% in three aftermarket years. However, we notice that the study sample in Zhang and King (2008) includes ADR IPOs and the IPOs of the Chinese cross-listing firms; they are not conventional IPO firms. Thirdly, we don't find any study on the operating performance of the U.S.-listed Chinese IPOs. Ang et al. (2014) compared the operating performance for the U.S.-listed Chinese firms with and without frauds. They focus on the causes of the frauds, but do not specifically investigate IPOs.

In our study, we focus on the Chinese two-stage IPOs in the U.S. We use both Chinese and U.S. performances benchmarks and report both stock market performance and operating performance. Our objective is to test the six hypotheses related to the IPO performance and provide a comprehensive analysis on two-stage firms' long-term performance in post-IPO period.

Underperformance of Backdoor Listing Firms

In addition to studies of long-term performance of conventional IPOs, there are some studies on the performance of backdoor listing firms. Adjei et al. (2008) reported 274 domestic backdoor listing transactions in the U.S. undertaken by U.S. Firms from 1990 to 2002. They

found that although investment banks are involved in backdoor listing deals, they do not serve as protectors of firm quality. [59] Overall, backdoor listing firms showed a declining return on assets and net profit margin Fifty-two percent of them were delisted from stock exchanges in three aftermarket years, compared to 27% for the U.S. conventional IPOs. Arellano-Ostoa and Brusco (2002) reported a delisting rate of 32.6% for the U.S. domestic backdoor listing firms in three years of listing. Gleason et al. (2005) reported a delisting rate of 54% in two years of listing.[60]

It is worth noting that in the backdoor listings in Adjei et al. (2008) and Gleason et al. (2005), the target firms are already listed on senior stock exchanges (NYSE, NASDAQ, and AMEX). Particularly in Gleason et al. (2005), 58% of the private firms and their public targets are in the same industry, and 64% of the target firms are financially healthy. After backdoor listing, half of the acquiring firms don't raise capital, 31% raise private capital and only 20% raise public capital. In other words, the purpose of the backdoor listing in Adjei et al. (2008) and Gleason et al. (2005) is not only to go public, but also to acquire the target firm's operating assets. This is different from the backdoor listing of two-stage firms whose target shell firms have a minimal amount of operating businesses and whose purpose is only for public listing.

[59] Leading investment banks, such as Goldman Sachs and Merrill Lynch, participate in reverse merger transactions, and 29% of investment banks have handled more than one reverse merger transaction.

[60] Chaplinsky and Haushalter (2010) reported that although backdoor listing firms underperform and backdoor listing transactions represent profitable investment opportunities for two groups of investors: (a) the shareholders of the public shell companies, and (b) the PIPE participants. During the three-day period around the announcement of backdoor listing, cumulative abnormal return for the shareholders of public shell companies is 25.1%. The PIPE participates earn positive abnormal returns because they purchase shares at discount. Other shareholders experience negative abnormal returns over a long term.

The Canadian research on backdoor listing is consistent with the U.S. research. Carpentier and Suret (2006) reported that Canada might be the largest backdoor listing market in terms of the number of transactions: more than half of the firms on the Toronto Stock Exchange (TSX) and Toronto Stock Venture Exchange (TSVX) go public through backdoor listing.[61] Most Canadian backdoor listings are done via capital pool companies (CPC). In order to avoid filing prospectus, the Canadian backdoor listing firms tend to raise capital through private placements.[62] However, because these private placements are too small for institutional investors, the participants are usually a group of individuals. Carpentier et al. (2010) reported that the Canadian backdoor listing firms underperform the Canadian conventional IPOs by 22.3% in three aftermarket years.[63] These firms have been frequently involved in acts of fraud, such as "Boiler Room," insider trading and accounting scandals.

The underperformance of backdoor listing firms tends to be driven by the self-selection issue. Adjei et al. (2008) argued that backdoor listing enables small and young firms to go public even when they are not ready to do so. Sjostrom (2008) argued that because high quality firms often have access to more attractive financing options, only the low quality firms opt for backdoor listing. Carpentier et al. (2010) pointed out that low quality firms resort to backdoor listing because they have little chance to attract underwriters to conduct conventional IPOs. Therefore, backdoor listing maybe a signal that a firm has been passed over by underwriters and is of low quality.

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[61] There were 1024 conventional IPOs and 1384 reverse mergers on the TSX and TSVX from 1993 to 2003.
[62] The median size is CA$1.1 million.
[63] The median cumulative raw return is -31.76% for Canadian conventional IPOs, and -54.08% for Canadian backdoor listing firms.

Hypothesis Testing and Research Methodology

As noted earlier, we test the six hypotheses in the context of two-stage firms' long-term performance during the post-IPO period. This section describes the expected findings under these hypotheses, and it also introduces our research methodology for hypothesis testing. We first define the variables in our hypothesis testing, and then we list the expected findings under each hypothesis. Lastly, we introduce our research methodology.

Hypotheses

In this study, we use varied index benchmarks, matching firms and the Carhart four-factor model, to test our hypotheses. We believe that as two-stage firms' operating businesses are in China, the Chinese matching firms and market factors are appropriate benchmarks to our performance evaluation and hypothesis testing. We also use the U.S. matching firms and market factors for the purposes of robustness testing. Table 3.4 lists and summarizes the expected findings with each individual hypothesis. As shown in the table, the same findings can be consistent with more than one hypothesis. For example, both investor sentiment hypothesis and market efficiency hypothesis predict a positive correlation between IPO initial return and long-term underperformance.

Research Methodology

Portfolio Construction Approach

We use two different portfolio construction approaches to test the six hypotheses. Using the event-study portfolio approach, we calculate the buy-and-hold abnormal returns and the alphas using the Carhart four-factor model for each individual two-stage firm during its post-IPO period. Then we include these abnormal returns (alphas) into an event-study portfolio to report the average performance and statistical significance. Using the calendar-time portfolio approach, we construct a time series portfolio. It starts when the first two-stage firm issues IPO (in 2005 as per our sample). At this time, the portfolio has only one two-stage firm. Subsequently, when the second two-stage firm conducts its IPO, we add the firm into the portfolio. The weights of the first and second two-stage firms are determined based on either equal weight or market capitalization weight. Then we repeat the same process to include each subsequent two-stage firm into this calendar-time portfolio. Every two-stage firm stays in the portfolio for three years. Then we exclude the firm and distribute its weight to the other firms in the portfolio. We use the calendar-time portfolio approach for two purposes: (a) by comparing the results in calendar-time portfolios and event-study portfolios, we provide a robustness test on two-stage firm's long-term post-IPO performance with Carhart four-factor model; (b) calendar-time portfolio performance for different industries provides a test for the fads hypothesis.

We expect that the event-study portfolio and calendar-time portfolio generate different results in terms of two-stage firms' long-term performance. First, the different performance models may have an impact. Our calendar-time portfolios only use the Carhart four-factor model, but

event-study portfolios use both the Carhart four-factor model and buy-and-hold abnormal returns. As the Carhart four-factor model adjusts stock returns for more risk factors than buy-and-hold abnormal returns, we expect that the alphas tend to be less statistically significant than buy-and-hold abnormal returns. Therefore, we are more likely to draw conclusions of significant underperformance in event-study portfolios than in calendar-time portfolios. Secondly, when we compare the alphas in event-study portfolios and calendar-time portfolios, the portfolio diversification effect may play a significant role. Because the calendar-time portfolio approach calculates risk-adjusted performance at portfolio level, it diversifies the individual two-stage firm's idiosyncratic risk. As a result, the variance of the calendar-time portfolio returns is more likely to be explained by the broad market-related factors. Therefore, when we use the Carhart four-factor model in calendar-time portfolios, the alphas tend to be insignificant. On the other hand, because the event-study portfolio approach calculates risk-adjusted performance at firm level, firms' idiosyncratic risks are more likely to affect the event-study portfolio performance. In this case, the alphas tend to be statistically significant.

We believe that the event-study portfolio and calendar-time portfolio serve for different purposes. As the faulty risk measurement, market efficiency, investor sentiment, and signalling hypotheses in this study investigate two-stage firms' IPO as an event, they don't consider the time series effect of portfolio construction. Therefore, the event-study portfolios are better suited to test these four hypotheses. We find previous studies also tend to test these hypotheses with event-study portfolios. The calendar-time portfolio, however, takes into account the time series effect. Because it closely simulates the actual investment process, it reflects the actual returns investors would have on the investments in two-stage firms. Therefore, the calendar-

time portfolio serves better for the purpose of stock market performance reporting. The only one case that we use both event-time portfolio and calendar-time portfolio is the testing of the fads hypothesis. This hypothesis compares two-stage firm's stock market performance at industry level. When we use event-study portfolios, we assume researchers conduct an ex-post-investigation on the two-stage firms in a certain industry. When we use calendar-time portfolios, we assume investors have no information on two-stage IPOs in the future. They can only invest in the two-stage firms currently available in the market.

Stock Market Performance Measurement

We report two-stage firms' buy-and-hold abnormal returns relative to six different performance benchmarks. These benchmarks include two market indexes and four control samples of Chinese and U.S. conventional IPOs. We also report Carhart four-factor alphas within three years of two-stage firms' IPO. The different benchmarks and performance measurement models enable us to generate robust results on two-stage firms' long-term post-IPO performance. We also report two-stage firms' buy-and-hold abnormal returns and Carhart four-factor alphas for each individual GICS sector. The detailed discussion on buy-and-hold abnormal return and the Carhart four-factor model is illustrated below.

Buy-and-Hold Abnormal Return (*BHAR*)

Buy-and-hold abnormal return (*BHAR*) is frequently used in the IPO literature. It considers the compounding effect and is able to measure the actual abnormal return for investors. However, test statistics for *BHAR* are more likely to be affected by portfolio rebalancing methods and

the skewness of stock return distribution. Lyon et al. (1999) suggested using a bootstrapped technique to reduce the impact of skewedness. *BHAR* is detailed below.

$$BHAR_{(i,a,b)} = \prod_{t=a}^{b}(1 + R_{it}) - \prod_{t=a}^{b}(1 + R_{bt}) \quad (3.1)$$

$$BHAR_{(p,a,b)} = \sum_{i=1}^{N} \omega_i \times BHAR_{(i,a,b)} \quad (3.2)$$

where R_{it} is the return of stock *i* at time *t*; ω_i is the weight of stock *i* in the portfolio; and R_{bt} is the return of benchmark at time *t*.

Bootstrapped skew-adjusted t statistics are:

$$t(BHAR_t) = \sqrt{N}\left(S + \frac{1}{3}\hat{\gamma}S^2 + \frac{1}{6N}\hat{\gamma}\right) \quad (3.3)$$

where $S = \frac{\overline{BHAR_t}}{\sigma(BHAR_t)}$, $\hat{\gamma} = \frac{\sum_{i=1}^{N}\left(BHAR_{i,t} - BHAR_t\right)^3}{N\sigma(BHAR_t)^3}$

In addition to *BHAR*, we use the portfolio rebalancing method in Ritter (1991) to reduce survivorship bias. That is, if a two-stage firm delists, its weight is equally allocated to the other surviving two-stage firms. Moreover, we calculate stock market returns based on bundles of shares and units on the first day after IPO. Beginning on the second day, only the return on the stock component is calculated.

<u>Fama-French Model and Carhart Four-Factor Model</u>

Fama-French model evaluates a firm's stock market performance by adjusting for risk factors, including market premium, size and book-to-market ratio. The Carhart four-factor model is developed in Carhart (1997). It adds a momentum factor into the Fama-French model. In our study, we use the Carhart four-factor model as well as both Chinese factors and U.S. factors. The data regarding the factors in this model is collected from Kenneth R. French's database and Stephano Marmi's database.[64] Detailed discussion on the Fama-French model and Carhart four-factor model is as follows.

Fama-French model indicates that size and book-to-market ratio can explain average stock returns (Fama and French, 1992 and 1993). The model is frequently quoted as:

$$R_{it} - R_{ft} = \alpha_i + \beta_{im}\left(R_{mt} - R_{ft}\right) + \beta_{iS}SMB + \beta_{iH}HML + \varepsilon_{it} \tag{3.4}$$

In this model, the small-minus-big size factor (*SMB)* measures the differential return between small cap and large cap stocks, and the high-minus-low book-to-market factor (*HML)* measures the differential return between value and growth stocks. All U.S. common stocks are ranked by size (market capitalization) and book-to-market ratio (book value of equity over market value of equity) in year *t*. Stocks are assigned to one of two portfolios based on size. Portfolio *B* (big) includes the largest 50% of stocks, while portfolio *S* (small) includes the lowest 50% of stocks. *SMB* is the equally weighted average return of portfolio *S* minus the equally weighted average return of portfolio *B* in year *t+1*. A similar process applies when

[64] Kenneth R. French's database is available at http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/data_library.html.
Stephano Marmi's database is available at http://homepage.sns.it/marmi/Data_Library.html.

calculating *HML*. Stocks are ranked on book-to-market ratio in year *t*, and subsequently the top 30% is assigned to portfolio *H* (high), and the bottom 30% to portfolio *L* (low). *HML* is the equally weighted average return of portfolio *H* minus the equally weighted average return of portfolio *L* in year *t+1*. The size and book-to-market factors in the Fama-French model are easy to understand because they are the actual returns of two investment strategies. *SMB* is the return of a zero investment portfolio that buys small-cap stocks and shorts large-cap stocks, while *HML* is the return of a zero investment portfolio that buys value stocks (high book-to-market ratio) and shorts growth stocks (low book-to-market ratio). Positive factor loadings of *SMB* and *HML*, or β_S and β_H, would indicate two-stage firms are small, growth stocks. A positive interception term α_i indicates outperformance, and a negative α_i underperformance.

Carhart (1997) added a momentum factor (*MOM*) into the Fama-French model and built a four-factor model. He constructed six value-weighted portfolios based on size (big, median and small) and prior stock market return (high and low). *MOM* is the average return of the two high prior return portfolios minus the average return of the two low prior return portfolios. The four-factor model is as follows:

$$R_{it} - R_{ft} = \alpha_i + \beta_{im}\left(R_{mt} - R_{ft}\right) + \beta_{iS}SMB + \beta_{iH}HML + \beta_{iM}MOM + \varepsilon_{it} \qquad (3.5)$$

Where β_{iM} is the factor loading of *MOM*.

Operating Performance Measurement

We also analyze and report two-stage firms' operating performance in three post-IPO years. Previous studies have used multiple measures for operating performance. Jain and Kini (1994) used four variables to assess operating performance: (a) operating return on assets; (b) operating cash flow; (c) sales growth; and (d) asset turnover. Ang et al. (2014) used four groups of variables: (a) profitability; (b) operating capacity; (c) debt paying ability; and (d) cash creation ability. In our study, we combine the measures in Jain and Kini (1994) and Ang et al. (2014). Specifically, we use operating return on assets, operating cash flow, and sales growth to measure two-stage firms' profitability; asset turnover, accounts receivable turnover, accounts payable turnover and inventory to measure operating capacity; and debt leverage ratio, income leverage ratio, cash leverage ratio and time interest earned to measure debt paying ability. We use the ratios of cash over current liabilities and total liabilities to measure two-stage firms' liquidity. This is different from Ang et al. (2014) who used the two cash ratios to measure firms' cash creation ability. The definition of each measure is as follows:

A. Profitability:

$$A(a)\ Operating\ Return\ on\ Assets = \frac{Operating\ Income\ before\ Depreciation}{Total\ Assets} \tag{3.6}$$

$$A(b)\ Operating\ Cash\ Flow = \frac{Operating\ Income - Capital\ Expenditure}{Total\ Assets} \tag{3.7}$$

$$A(c)\ Sales\ Growth = \frac{Net\ Sales_t - Net\ Sales_{t-1}}{Net\ Sales_{t-1}} \tag{3.8}$$

B. Operating Capacity:

$$B(a)\ Turnover\_total\ assets = \frac{Net\ Sales}{Total\ Assets} \tag{3.9}$$

$$B(b)\ Turnover\_accounts\ receivable\ = \frac{Net\ Sales}{Average\ Accounts\ Receivable} \tag{3.10}$$

$$B(c)\ Turnover\_accounts\ payable\ = \frac{Cost\ of\ Goods\ Sold}{Average\ Accounts\ Payable} \tag{3.11}$$

$$B(c)\ Turnover\_inventory\ = \frac{Cost\ of\ Goods\ Sold}{Average\ Inventory} \tag{3.12}$$

C. Debt Paying Ability:

$$C(a)\ Debt\ Leverage\ Ratio = \frac{Total\ Debt}{Total\ Assets} \tag{3.13}$$

$$C(b)\ Income\ Coverage\ Ratio\ = \frac{Operating\ Income}{Interest\ Expense} \tag{3.14}$$

$$C(c)\ Cash\ Coverage\ Ratio\ = \frac{Cash\ and\ Short\ Term\ Investment}{Interest\ Expense} \tag{3.15}$$

$$C(d)\ Times\ Interest\ Earned\ (TIE)\ = \frac{Earnings\ Before\ Interest\ and\ Tax}{Interest\ Expense} \tag{3.16}$$

D. Liquidity

$$D(a)\ Cash_1\ = \frac{Cash\ and\ Short\ Term\ Investment}{Total\ Current\ Liabilities} \tag{3.17}$$

$$D(b)\ Cash_2\ = \frac{Cash\ and\ Short\ Term\ Investment}{Total\ Debt} \tag{3.18}$$

Consistent with the literature, we use difference-in-difference (*DID*) estimators to evaluate these four groups of variables. The calculation of *DID* estimators is as follows:

$$DID_i\ =\ \left(F_{i,t} - F_{i,t-1}\right) - \left(CF_{i,t} - CF_{i,t-1}\right) \tag{3.19}$$

where $F_{i,t}$ is two-stage firm *i*'s operating performance during year *t*; and $CF_{i,t}$ is the control firm's operating performance.

Methodology

We use linear regression models to test the investor sentiment hypothesis, market efficiency hypothesis and signalling hypothesis.

The linear regression model, used to test the investor sentiment hypothesis and the market efficiency hypothesis, is shown in formula 3.20. In this model, the dependent variables are three-year buy-and-hold abnormal returns (*BHAR*) and Carhart four-factor alphas (*Alpha*). The independent variables include IPO offer size (*Proceeds*) and initial return (*Underpricing*). *Proceeds* is a control variable to control for the size effect. *Underpricing* reflects IPO initial return, which is a proxy for IPO underpricing.[65] A significant negative regression coefficient for *Underpricing* would indicate a negative correlation between IPO initial returns and long-term performance. It would be the evidence needed to support the investor sentiment hypothesis and market efficiency hypothesis.

$$BHAR_i/Alpha_i = \alpha_0 + \alpha_1 Proceeds_i + \alpha_2 Underpricing_i \quad (3.20)$$

The linear regression model used to test the signalling hypothesis is shown in formula 3.21. We continue to use three-year buy-and-hold abnormal returns (*BHAR*) and Carhart four-factor alphas (*Alpha*) as the dependent variable. IPO offer size (*Proceeds*) remains a control variable.

[65] We have collected other proxies which can serve as control variables. These variables include underwriter reputation (*Underwriter*), CEO-Chairman duality (*Duality*), acquisition (*Acquisition*) and shares buyback (*Buyback*). However, due to our sample size, the insufficient number of observations does not allow us to use these control variables altogether in a linear regression model. In addition, we test the sub sets of these control variables; but none of them shows significant results. The results on Formula 3.20 are not affected by these variables, either.

The other control variables in this model include underwriter reputation (*Underwriter*), CEO-Chairman duality (*Duality*), acquisition (*Acquisition*), and shares buyback (*Buyback*). Any statistically significant regression coefficient for these proxy variables would indicate a signalling effect, thus support the signalling hypothesis.

$$BHAR_i / Alpha_i = \alpha_0 + \alpha_1 Proceeds_i + \alpha_2 Underwriter_i + \alpha_3 Duality_i + \alpha_4 Acquisition_i + \alpha_4 Buyback_i \quad (3.21)$$

Variable Definitions

We collect and calculate the variables that are discussed in the previous section. The names and descriptions for these variables are listed in Table 3.3.

Empirical Results

Stock Market Performance: Event-Study Portfolios

Table 3.5 shows the performance of event-study portfolios in up to three post-IPO years. We use the results to test the faulty risk measurement hypothesis. In Panel A, we report the buy-and-hold abnormal returns under six different benchmarks. These benchmarks include two market indexes, namely the Shanghai Stock Exchange A Share Index and Russell 2000 Index, and four control samples of conventional IPOs. As two-stage firms' operating businesses are in China, we focus on the comparison between two-stage firms and Chinese conventional IPOs. Other performance benchmarks are employed for the purpose of robustness testing. We find that the buy-and-hold abnormal returns relative to the two market indexes (*BHAR_SH* and

BHAR_RU) in the first post-IPO year (*t*, *t+1*) are -17.32% and -31.69%, respectively. The results are statistically significant. However, when we compare two-stage firms to the control samples of conventional IPOs, only the performance relative to the market capitalization matching U.S. conventional IPOs (*BHAR_US_MarketCap*) shows significantly negative results (-35.20%). The buy-and-hold abnormal returns relative to the proceeds matching Chinese conventional IPOs (*BHAR_CHN_Proceeds*), the market capitalization matching Chinese conventional IPOs (*BHAR_CHN_MarketCap*) and the proceeds matching U.S. conventional IPOs (*BHAR_US_Proceeds*) are -4.28%, -2.03% and -8.27%, respectively; none of them are significantly different from zero. The finding indicates that using different performance benchmarks leads to different conclusions on two-stage firms' short-term performance.

Next, we extend our study period from one post-IPO year to three post-IPO years (*t*, *t+3*). The extension in the time horizon allows us to compare two-stage firms' performance from short term to long term. It also allows us to show the impact of different time horizons on the conclusions of firms' performance. We find that the three-year buy-and-hold abnormal returns for two-stage firms are significantly negative relative to both the market indexes and the control samples of conventional IPOs. The underperformance ranges from -50.96% to -99.15%. This result indicates that two-stage firms underperform in the long term (three post-IPO years). Moreover, the difference between one-year and three-year results indicates a downward trend in two-stage firms' stock market performance during the post-IPO period. In Panel B, we use the Carhart four-factor model with a time horizon of three post-IPO years. Because the Carhart four-factor model adjusts stock returns for risk factors, including market

premium, size, book-to-market ratio and market momentum, we believe it could provide a better estimate of firm performance on a risk-adjustment basis. Once again, we focus on the comparison between two-stage firms and their Chinese performance benchmark. We find a significantly average alpha of -0.019 with Chinese factors. The average alpha with U.S. factors also shows a significantly negative result of -0.037. They are consistent with the detected long-term underperformance in Panel A. Summarizing the results in Panel A and Panel B, we find two-stage firms underperform in three post-IPO years. Moreover, this result is robust under six different benchmarks and two different models. It indicates that the detected long-term underperformance in our study is not affected by the selection of performance benchmarks or measurement models. This finding doesn't support the faulty risk measurement hypothesis, which states that the detected long-term IPO underperformance is the result of the inappropriate use of risk measures.

In Table 3.6, we test the fads hypothesis. In Panel A, we report three-year buy-and-hold abnormal returns by Global Industry Classification Standard (GICS) sector. Our performance benchmarks are the four control samples of conventional IPOs. We find that the two-stage firms in the Industrials sector have buy-and-hold abnormal returns of -67.03%, -86.48%, -56.42% and -64.67%, respectively. All these results are statistically significant. The buy-and-hold abnormal returns for the Materials sector are significantly negative. The Consumer Discretionary, Consumer Staple, Energy, and Information Technology sectors also show some evidence of long-term underperformance. However, the buy-and-hold abnormal returns for the Healthcare sector are not significantly different from zero. In Panel B, we use the Carhart four-factor model. We find that the alphas for the Healthcare sector are 0.014 and -0.018 and are

not significantly different from zero. This is consistent with the result in Panel A. It indicates that the two-stage firms in the Healthcare sector don't underperform in the long term. In addition, we find significantly negative alphas for the Consumer Discretionary sector with Chinese factors. The Consumer Staples, Energy, Industrials, and Information Technology sectors also show significantly negative alphas with U.S. factors. The Materials sector shows significantly negative alphas with both Chinese and U.S. factors. Overall, the findings in Panel A and Panel B are consistent with Ritter (1991) in that IPO firms' long-term performance varies across different industries. These results support the fads hypothesis, which asserts that the detected long-term IPO underperformance is driven by industry-specific fads.

Next, we use linear regression models to test the investor sentiment hypothesis and the market efficiency hypothesis. The two hypotheses predict a negative correlation between IPO initial return and long-term performance. In Table 3.7, the independent variables in the regression models include IPO offer size (*Proceeds*) and initial return on IPO day (*Underpricing*); the former is a control variable and the latter is a proxy variable. In Panel A, we use three-year buy-and-hold abnormal returns as dependent variables. We find that the regression coefficients for *Underpricing* in Model B and Model C are -4.256 and -3.531, respectively, making them statistically significant. They indicate that the two-stage firms with higher initial returns tend to have lower long-term performance. This implies a negative correlation between IPO initial return and long-term performance. The evidence is consistent with the investor sentiment hypothesis and the market efficiency hypothesis. However, when we use the Carhart four-factor alphas as dependent variables in Panel B, the regression coefficients for *Underpricing* remain negative, but are not statistically significant. We argue that the different results in Panel

A and Panel B are likely driven by the different research methodologies. Because our control samples match two-stage firms based on industry and size, but not firm valuation, the buy-and-hold abnormal returns in our study are not adjusted for the firm valuation effect. They contain the information on investors' valuation on a two-stage firm. Because *Underpricing* also contains the information on firm valuation, it is able to explain a significant portion of the variance in buy-and-hold returns, resulting in the detected significant regression coefficients in Panel A. On the other hand, the dependent variables in Panel B are Carhart four-factor alphas, which are already adjusted for the firm valuation effect (or the book-to-market ratio in the Carhart four-factor model). The alphas contain a minimal amount of information on firm valuation. Thus, *Underpricing* is not significantly correlated with the alphas. As a result, the regression coefficients for *Underpricing* in Panel B are not significant. Combining the results in Panel A and Panel B, we find that our conclusion on the relation between IPO firms' initial return and long-term performance is significantly affected by the selection of performance measurement models. Our evidence partially supports the investment sentiment hypothesis and the market efficiency hypothesis.

In Table 3.8, we use linear regression models to test the signalling hypothesis on long-term IPO performance. Our independent variables include one control variable, namely IPO offer size (*Proceeds*), as well as four proxy variables: underwriter reputation (*Underwriter*), CEO-Chairman duality (*Duality*), acquisition (*Acquisition*), and share buybacks (*Buyback*). Our objective is to investigate the signalling impact of the four proxy variables. In Panel A, the dependent variables are three-year buy-and-hold abnormal returns. Model A and Model B use the Chinese conventional IPOs as control samples. We find a significantly negative regression

coefficient of -0.581 for Duality in Model A. It indicates that the two-stage firms with CEO and Chairman duality tend to have lower long-term performance. Then in Model B, the significant positive regression coefficient for *Buyback* indicates that the two-stage firms with shares buyback tend to have higher post-IPO performance. The results show significant signalling impact of *Duality* and *Buyback*. They are consistent with our signalling hypothesis, which asserts that some variables can predict two-stage firms' long-term performance during post-IPO period. However, when we compare it to the U.S. conventional IPOs in Model C and Model D, we do not find any significant regression coefficient for the four proxy variables. The R squares in the two models are not statistically significant, either. The evidence shows that the four proxy variables have no signalling impact on two-stage firms' performance relative to their U.S. peers. On the other hand, because the U.S. investors have a limited amount of information on the Chinese conventional IPOs, the signalling impact on the performance relative to the Chinese conventional IPOs is not fully priced into two-stage firms' IPO valuation. This leads to the significant signalling impact of *Duality* and *Buyback* in Model A and Model B.

In Panel B of Table 3.8, we use the Carhart four-factor alphas as dependent variables. When we use the alphas relative to the Chinese factors, we find a significantly positive regression coefficient for *Buyback*, indicating that this proxy variable has significant signalling potential. However, when use the alphas relative to the U.S. factors, we do not find any significant signalling impact for all the four proxy variables. This finding is consistent with our results in Panel A. Once again, we argue that listing location may explain the different results. Combining Panel A and Panel B, we find the evidence to support our signalling hypothesis.

However, the detected signalling impact is dependent on performance benchmark selection. In particular, when we compare two-stage firms to their Chinese peers, we find that share buybacks signals better long-term performance. However, when we compare to the U.S. peers, the signalling impact disappears.

Stock Market Performance: Calendar-Time Portfolios

Next, we construct calendar-time portfolios for two-stage firms. Table 3.9 shows equal weighted and value weighted calendar-time portfolios. Our performance measures are the Carhart four-factor alphas relative to the Chinese and U.S. factors. We find that the alphas (*Constant*) are -0.010, -0.012, -0.012 and -0.014, respectively; but none of them is significantly different from zero. It indicates that the calendar-time portfolio of two-stage firms does not underperform in relative terms. This is not consistent with our findings in Table 3.5, where two-stage firms show significantly negative three-year buy-and-hold abnormal returns. We find the coefficients for the market premium factor (Rm - Rf) in Table 3.9 are statistically significant in all of the four models, indicating that market premium explains a significant portion of the two-stage firms' underperformance. This finding is consistent with our expectation. As we discussed in the research methodology section, the different results in calendar-time portfolios and event-study portfolios are likely driven by (a) the different portfolio diversification effect, and (b) the different risk factors implied in the Carhart four-factor model and buy-and-hold abnormal returns.

Table 3.10 reports the Carhart four-factor alphas with equal weighed and value weighted calendar-time portfolios and by GICS sectors.[66] We find a significantly negative alpha of -0.030 for the Consumer Discretionary sector. Otherwise, the Industrials sector has significantly negative alphas of -0.035 and -0.037 in equal weighted and value weighted portfolios, respectively. However, the Consumer Staples, Energy, Healthcare, Information technology and Materials sectors do not show significant alphas. Overall, our results on calendar-time portfolios show that the two-stage firms in different industries differ in terms of their post-IPO long-term performance. When we compare Table 3.10 to the event-time portfolio results in Table 3.6, we find that the Consumer Discretionary and Industrials sectors display long-term underperformance under both of the portfolio construction approaches, while the Healthcare sector does not. Once again, the evidence supports the fads hypothesis, which asserts that the long-term IPO underperformance tends to be driven by specific industries.

Operating Performance

In Table 3.11, we report two-stage firms' operating performance in four categories: profitability, operating capacity, debt paying ability and liquidity measures. The categories are similar to Ang el al. (2012). Our objective is to conduct a comprehensive analysis on operating performance and test the firm quality hypothesis. Once again, as two-stage firm's operating businesses are in China, we believe Chinese conventional IPOs are appropriate benchmarks to evaluate two-stage firms' operating performance. We also compare two-stage firms to U.S

[66] We find that Utilities sector has significantly negative performance (or alphas) in all the four calendar-time portfolios. But because the sector has only one observation, the significant result cannot provide any reference.

conventional IPOs for the purposes of robustness testing. In Panel A, we report two-stage firms' profitability up to three post-IPO years. In the first year of IPO (*t+1*), their average operating returns on assets are 4.26% and 3.59% higher than the proceeds matching (*Ctrl_CHN_Proceeds*) and the market capitalization matching Chinese IPOs (*Ctrl_CHN_MarketCap*). Then the average operating return on assets declines to -0.32% and -1.72% in the second year of IPO (*t+2*). A significant underperformance of -6.10% and -15.12% is observed in the third year of IPO (*t+3*). We find similar trends in operating cash flow and sales growth as well. They indicate that two-stage firms have deteriorating profitability compared to Chinese conventional IPOs. On the other hand, we find that two-stage firms have consistently higher operating return on assets and operating cash flow than the two U.S. control samples (*Ctrl_US_Proceeds* and *Ctrl_US_MarketCap*).

In Panel B of Table 3.11, we report two-stage firms' operating capacity during the post-IPO years. We find that compared to the Chinese conventional IPOs, two-stage firms have significantly higher accounts payable turnover and inventory turnover in all the three post-IPO years. However, total assets turnover is significantly positive in *t+1*, but becomes insignificant in *t+2* and significantly negative in *t+3*. Therefore, the results on operating capacity are mixed.

In Panel C, we find that two-stage firms have significantly lower leverage ratio than Chinese conventional IPOs from *t+1* to *t+3*. A robustness testing with U.S. conventional IPOs shows similar results. Correspondingly, we find two-stage firms also have higher time interest earned than U.S. conventional IPOs from *t+1* to *t+3*. We find some significant results showing that two-stage firms have higher income coverage ratio and lower cash coverage ratio than U.S.

conventional IPOs. However, the results are insignificant compared to Chinese conventional IPOs.

In Panel D, we report two-stage firms in terms of liquidity measures. We find that two-stage firms have higher cash to current liabilities ratio than Chinese conventional IPOs in *t+1*, but that the results become insignificant in *t+2* and *t+3*. The comparison with U.S. conventional IPOs shows insignificant results in all the three post-IPO years.

Summarizing the results in Table 3.11, two-stage firms have lower operating return on assets and sales growth than Chinese conventional IPOs. This shows that their operating profitability deteriorates during the post-IPO years. Secondly, the results of the long-term operating capacity are dependent on specific measures. For example, two-stage firms have higher accounts payable turnover and inventory turnover, but lower total assets turnover. Thirdly, two-stage firms outperform the conventional IPOs in terms of debt paying ability in that they have lower debt leverage ratio. Lastly, we don't find that two-stage firms show significant differences in terms of the liquidity measures.

Given two-stage firms' lower operating return on asset, lower debt leverage ratio, as well as higher accounts payable turnover and inventory turnover, we speculate that two-stage firms accept a lower profit margin in exchange for a larger sales volume. By doing so, they sacrifice a certain level of profitability to obtain higher operating capacity and debt paying ability. Overall, the results in Table 3.11 are mixed. We don't find any overwhelming evidence indicating that two-stage firms have an inferior operating performance during the post-IPO

years. In other words, the detected two-stage firms' stock market underperformance in Table 3.5 cannot be explained by firm quality. This is inconsistent with the firm quality hypothesis.

Overall Summary

Before we could draw our overall conclusions, we note the importance of reiterating our perception of the mixed results generated from the different performance benchmarks, models and portfolio construction approaches. Accordingly, we summarize our results with regard to our six hypotheses and list them in Table 3.12. We also list our findings on two-stage firms' stock market and operating performance. As we have discussed previously, because two-stage firms' operating businesses are in China, we believe Chinese conventional IPOs and Chinese market factors serve as appropriate performance benchmarks for two-stage firms. Also, we believe that the Carhart four-factor model tends to generate less biased results than buy-and-hold abnormal returns, since the former adjusts stock market returns for four risk factors.[67] In addition, we believe that different portfolio construction approaches serve different purposes. The event-study portfolios are better suited to test the faulty risk measurement, the market efficiency, the investor sentiment and the signalling hypotheses, as these hypotheses do not consider or require the time series effect of a two-stage firm portfolio. On the other hand, calendar-time portfolios are better suited for investment performance reporting. If an investor were to create a buy-and-hold portfolio of all two-stage firm stocks over the entire study period, a calendar-time portfolio would provide a better estimate of his or her actual investment return.

[67] The risk factors are market premium, size, book-to-market ratio and momentum.

Panel A of Table 3.12 lists our findings on two-stage firm's three-year post-IPO performance. With the Chinese factors, we believe that an insignificant Carhart four-factor alpha ranging from -0.010 to -0.012 is an appropriate estimate of the risk-adjusted return on two-stage firm portfolio. Our robustness tests with U.S. factors also show similar results, indicating that two-stage firms do not display long-term stock market underperformance in the long term. With regard to the operating performance, we believe the lower operating return on assets is a result of two-stage firms' strategy to focus on sales. We do not believe this is the evidence of inferior operating performance but possibly a different strategic intent. The robustness testing shows those two-stage firms even have higher operating return on assets than the U.S. conventional IPOs.

In Panel B of Table 3.12, we summarize our findings on the hypothesis testing. In our study, the different measurement models (Carhart four-factor model and buy-and-hold abnormal return) and performance benchmarks show similar results on long-term performance. This is inconsistent with the expected findings based on the faulty risk measurement hypothesis. With regard to the testing of the fads hypothesis, event-study portfolios and calendar-time portfolios show consistent and confirmative evidence. The Consumer Discretionary sector tends to have long-term underperformance, but the Healthcare sector does not. The result supports the fads hypothesis. Next, the market efficiency hypothesis and the investor sentiment hypothesis expect a negative correlation between the IPO initial return and long-term performance. We detect this relationship in our linear regression model and the result is statistically significant. Next, our findings on the significant signalling impact of share buybacks on long-term performance support the signalling hypothesis. Finally, we do not find that two-stage firms

have any inferior operating performance during the post-IPO years, which is inconsistent with the firm quality hypothesis. In summary, the evidence in this study supports the fads hypothesis, the market efficiency hypothesis, the investment sentiment hypothesis and the signalling hypothesis, but it does not support the faulty risk measurement hypothesis or the firm quality hypothesis.

Conclusions

In this essay, we report two-stage firms' post-IPO performance and test six hypotheses that may explain the performance. Using the event-study portfolio approach, we find that different performance benchmarks and measurement models generate similar conclusions on two-stage firms' post-IPO long-term performance. Besides, we detect a significant negative correlation between two-stage firms' IPO initial return and long-term performance. In addition, some proxy variables, such as share buybacks and CEO-Chairman duality, are able to predict long-term performance. Accordingly, these results support the investor sentiment hypothesis, the market efficiency hypothesis and the signalling hypothesis, but do not support the faulty risk measurement hypothesis.

The calendar-time portfolio approach allows us to report investors' time series return on two-stage firm portfolios. It provides a robustness testing with regard to the fads hypothesis. With this approach, we do not find any significant evidence of long-term underperformance. In addition, both event-study portfolios and calendar-time portfolios show varied long-term performance for different industry sectors. The evidence supports the fads hypothesis.

Our operating results along with the corresponding stock market-based long-term performance in event-study portfolios allow us to test the firm quality hypothesis. We find that two-stage firms have lower operating return on assets, but lower debt leverage ratio, higher inventory turnover ratio and higher total assets turnover ratio. We speculate that the mixed results on operating performance are driven by two-stage firms' strategic intent to accept a lower sales margin in exchange for a larger sales volume. We conclude that two-stage firms do not have a deteriorating operating performance during the post-IPO years. This evidence does not support the firm quality hypothesis.

Table 3.1 Summary of the Hypotheses on IPO Long-Term Underperformance

Hypothesis	Definition	Empirical Evidence
Faulty Risk Measurement Hypothesis	The detected IPO long-term underperformance is a result of the inappropriate use of performance measurement benchmarks and models. These benchmarks and models don't adjust for firm risks properly.	Gompers and Lerners (2003), Alvarez and Gonzalez (2005), Loughran and Ritter (1995), Bai and Zhang (2004).
Fads Hypothesis	Investor's over-optimism towards a specific industry causes the over-valuation of the IPOs in that industry; it results in the detected long-term underperformance of the whole IPO sample.	Ritter (1991), Allen et al. (1999), Alvarez and Gonzalez (2005).
Investor Sentiment Hypothesis	Investors give more weight to IPO firm's recent financial data, leading to the over-optimism on IPOs. When the over-optimism disappears in a long term, the IPO firm's stock market performance declines.	Borges (2007)
Market Efficiency Hypothesis	In an efficient market, the over-valued IPO shares are corrected, resulting in the detected long-term underperformance of IPO firms.	Aggarwal et al. (1993), Kooli and Suret (2004).
Firm Quality Hypothesis	The detected IPO long-term stock market underperformance is driven by their deteriorating operating performance in post-IPO period.	Jain and Kini (1994), Mikkelson et al. (1997), Allen et al. (1999), Wang (2005).
Signalling Hypothesis	Some variables have significant impact on IPO firms; they provide signalling effect on IPO firm's long-term performance.	Crutchley et al. (2002) on underwriter reputation, Li and Naughton (2007) on CEO-Chairman duality, Lyandres et al. (2011) on acquisition, Jain et al. (2009) on shares buyback.

Table 3.2 Cumulative Stock Market Performance of Chinese Domestic IPOs

Author(s)	Period	Sample Size	Benchmark	Performance
Bai and Zhang (2004)	1998 - 2000	341	Size-Matched Chinese Firms	3% in one year; 1% in three years
Su and Bangassa (2011)	2001 - 2006	391	Shanghai Stock Exchange A-Share Index	-6.01% in one year; -18.16% in three years
Liu et al. (2010)	2000 - 2004	447	Size and Book-to-Market Matched Chinese Firms	-0.6% in one year; -16.2% in three years
Li and Naughton (2007)	1999 - 2001	314	Shanghai Stock Exchange A-Share Index; Shanghai Stock Exchange Composite Index; Shanghai Stock Exchange Industry Index.	-3.19% in one year; -10.6% in three years
Varadzhakov (2009)	2004 - 2008	378	None	35% in three months; 14% in one year

Table 3.3 Definitions of Variables

Variable	Name	Description	Data Source
Acquisition	Acquisitions in Post-IPO Period	This variable is a dummy variable; it equals 1 if a two-stage firm has acquisition within three post-IPO years and 0 otherwise	LexisNexis; Capital IQ
Alpha_US	Alpha in the Carhart four-factor Model with U.S. Factors	This is the intercept term of a linear regression. The dependent variables are market risk, size, book-to-market ratio and momentum. The factors are obtained from Kenneth French's website; the independent variable is a firm's stock market return.	Kenneth French's Website (http://mba.tuck.dartmouth.edu/pages/faculty/ken.french/); Capital IQ; Thomson Reuters
Alpha_CHN	Alpha in the Carhart four-factor Model with Chinese Factors	This is the intercept term of a linear regression. The dependent variables are market risk, size, book-to-market ratio and momentum. The factors are obtained from Stefano Marmi's website; the independent variable is a firm's stock market return.	Stefano Marmi's Website (http://homepage.sns.it/marmi/Data_Library.html);Capital IQ; Thomson Reuters
BHAR_RU	Buy-and-Hold Abnormal Return relative to Russell 2000 Index	This variable measures the cumulative excess investment return relative to Russell 2000 Index.	Capital IQ; Thomson Reuters
BHAR_SH	Buy-and-Hold Abnormal Return relative to Shanghai Index	This variable measures the cumulative excess investment return relative to Shanghai Stock Exchange A Share Index.	Capital IQ; Thomson Reuters
BHAR_CHN_Proceeds	Buy-and-Hold Abnormal Return relative to the Chinese Proceeds Matching IPO Firms	This variable measures the cumulative excess investment return relative to the Chinese conventional IPOs with proceeds matching.	Capital IQ; Thomson Reuters
BHAR_CHN_MarketCap	Buy-and-Hold Abnormal Return relative to the Chinese Market Capitalization Matching IPO Firms	This variable measures the cumulative excess investment return relative to the Chinese conventional IPOs with market capitalization matching.	Capital IQ; Thomson Reuters

Table 3.3 Definitions of Variables (Cont'd)

Variable	Name	Description	Data Source
BHAR_US_Proceeds	Buy-and-Hold Abnormal Return relative to the U.S. Proceeds Matching IPO Firms	This variable measures the cumulative excess investment return relative to the U.S. conventional IPOs with proceeds matching.	Capital IQ; Thomson Reuters
BHAR_US_MarketCap	Buy-and-Hold Abnormal Return relative to the U.S. Market Capitalization Matching IPO Firms	This variable measures the cumulative excess investment return relative to the U.S. conventional IPOs with market capitalization matching.	Capital IQ; Thomson Reuters
Buyback	Shares Buybacks in Post-IPO Period	This is a dummy variable; it equals 1 if a two-stage firm has shares buybacks within three years of IPO, and 0 otherwise.	LexisNexis; Capital IQ
Ctrl_CHN_MarketCap	Control Sample of Chinese Domestic IPOs - Market Capitalization Matching	This control sample of Chinese conventional IPOs matches the two-stage firm sample with two-digit SICS code and market capitalization on IPO day.	Bloomberg
Ctrl_CHN_Proceeds	Control Sample of Chinese Domestic IPOs - Gross Proceeds Matching	This control sample of Chinese conventional IPOs matches the two-stage firm sample with two-digit SIC code and IPO gross proceeds.	Bloomberg
Ctrl_US_MarketCap	Control Sample of U.S. Domestic IPOs - Market Capitalization Matching	This control sample of U.S. conventional IPOs matches the two-stage firm sample with two-digit SIC code and market capitalization on IPO day.	Bloomberg
Ctrl_US_Proceeds	Control Sample of U.S. Domestic IPOs - Gross Proceeds Matching	This control sample of U.S. conventional IPOs matches the two-stage firm sample with two-digit SIC code and IPO gross proceeds.	Bloomberg
Duality	CEO-Chairman Duality	This is a dummy variable; it equals 1 if CEO and Chairman is one person, and 0 otherwise.	LexisNexis; Capital IQ

Table 3.3 Definitions of Variables (Cont'd)

Variable	Name	Description	Data Source
Proceeds	Gross Proceeds in IPO	Natural logarithm of the total gross proceeds raised in IPO	Capital IQ; Thomson Reuters
Time	Time Interval between Public Listing and IPO	The number of months between a two-stage firm's backdoor listing and IPO.	LexisNexis
TS	Two-Stage Firms	The sample of two-stage firms that we have collected for this study.	LexisNexis; Edgar; Capital IQ; Thomson Reuters
Underpricing	Underpricing in IPO	The indirect cost of IPO. It is the difference between offering price and closing price on IPO day, divided by the closing price.	Capital IQ; LexisNexis
Underwriter	Underwriter Reputation	This is an ordinal variable; it uses a scale from one to nine to measure the ranking or reputation of IPO underwriter. One represents lowest reputation; nine represents highest reputation. The rankings are obtained from Jay Ritter's database.	Jay Ritter's website (https://site.warrington.ufl.edu/ritter/ipo-data/)

Table 3.4 Hypothesis and Expected Findings

Hypothesis	Expected Findings
Faulty Risk Measurement Hypothesis	• Significant underperformance relative to the market indexes. • Insignificant underperformance relative to matching firms and Carhart four-factor model.
Fads Hypothesis	• Varied long-term performance across industries. • Negative correlation between initial return and long-term performance.
Investor Sentiment Hypothesis Market Efficiency Hypothesis	• Negative correlation between initial return and long-term performance.
Firm Quality Hypothesis	• Inferior operating performance.
Signalling Hypothesis	• Significant correlation between IPO long-term performance and any one of the following proxy variables: underwriter reputation, CEO-Chairman duality, acquisition, shares buyback.

Table 3.5 Stock Market Performance (Event-Study Portfolio)

Event-study portfolios are constructed to report two-stage firm's stock market performance. The event study portfolio approach assumes equal weight of each firm in the portfolio. Then each individual two-stage firm's stock market performance is calculated during the time period three years within the firm's IPO. The performance measures include cumulative buy-and-hold returns and Carhart four-factor alphas.

Panel A Buy-and-Hold Abnormal Returns

BHAR_SH measures the cumulative excess investment return relative to Shanghai Stock Exchange A Share Index. *BHAR_RU* measures the cumulative excess investment return relative to Russell 2000 Index. *BHAR_CHN_Proceeds* measures the cumulative excess investment return relative to the Chinese conventional IPOs with proceeds matching. *BHAR_CHN_MarketCap* measures the cumulative excess investment return relative to the Chinese conventional IPOs with market capitalization matching. *BHAR_US_Proceeds* measures the cumulative excess investment return relative to the U.S. conventional IPOs with proceeds matching. *BHAR_US_MarketCap* measures the cumulative excess investment return relative to the U.S. conventional IPOs with market capitalization matching.

	(t, t+1)		**(t, t+2)**		**(t, t+3)**	
	mean	p-value	mean	p-value	mean	p-value
BHAR_SH	-17.32%	0.010***	-52.57%	0.000***	-50.96%	0.000***
BHAR_RU	-31.69%	0.000***	-72.92%	0.000***	-99.00%	0.000***
BHAR_CHN_Proceeds	-4.28%	0.508	-32.54%	0.000***	-54.76%	0.000***
BHAR_CHN_MarketCap	-2.03%	0.774	-37.10%	0.000***	-99.15%	0.000***
BHAR_US_Proceeds	-8.27%	0.359	-42.40%	0.000***	-71.73%	0.001***
BHAR_US_MarketCap	-35.20%	0.005***	-64.93%	0.000***	-71.19%	0.000***

*** significant at 1%, ** significant at 5%, * significant at 10%.

Panel B Alpha in Carhart Four-Factor Model

Alpha_CHN is the intercept term of a linear regression where the dependent variables are market risk, size, book-to-market ratio and momentum. The factors are obtained from Stefano Marmi's website; the independent variable is a firm's stock market return. *Alpha_US* is the intercept term of a linear regression where the dependent variables are market risk, size, book-to-market ratio and momentum. The factors are obtained from Kenneth French's website; the independent variable is a firm's stock market return.

	(t, t+3)	
	mean	p-value
Alpha_CHN	-0.019	0.003***
Alpha_US	-0.037	0.000***

*** significant at 1%, ** significant at 5%, * significant at 10%.

Table 3.6 Long-Term Stock Market Performance by GICS Sectors (Event-Study Portfolio)

The stock market return is reported by Global Industry Classification Standard (GICS) sectors. These sectors include consumer discretionary, consumer staples, energy, healthcare, industrials, information technology, materials and utilities. The stock market performance of the each sector is measured with both cumulative abnormal buy-and-hold returns and Carhart four-factor model alphas.

Panel A Buy-and-Hold Abnormal Returns

The cumulative buy-and-hold abnormal returns are calculated for the time period three years after a two-stage firm's IPO. *BHAR_CHN_Proceeds* measures the cumulative excess investment return relative to the Chinese conventional IPOs with proceeds matching. *BHAR_CHN_MarketCap* measures the cumulative excess investment return relative to the Chinese conventional IPOs with market capitalization matching. *BHAR_US_Proceeds* measures the cumulative excess investment return relative to the U.S. conventional IPOs with proceeds matching. *BHAR_US_MarketCap* measures the cumulative excess investment return relative to the U.S. conventional IPOs with market capitalization matching.

GICS Sectors	*BHAR_CHN_Proceeds (t, t+3)*		*BHAR_CHN_MarketCap (t, t+3)*		*BHAR_US_Proceeds (t, t+3)*		*BHAR_US_MarketCap (t, t+3)*	
	Mean	p-value	mean	p-value	mean	p-value	mean	p-value
Consumer Discretionary	-56.29%	0.168	-122.45%	0.040**	-96.42%	0.034**	-86.32%	0.027**
Consumer Staples	-70.85%	0.008***	-69.38%	0.102	-73.93%	0.093*	-104.34%	0.013**
Energy	-101.07%	0.150	-84.50%	0.240	-256.65%	0.352	-38.27%	0.012**
Healthcare	-21.20%	0.515	-218.48%	0.239	-264.87%	0.423	-12.67%	0.662
Industrials	-67.03%	0.051*	-86.48%	0.012**	-56.42%	0.086*	-64.67%	0.061*
Information Technology	-29.61%	0.136	-35.73%	0.263	21.40%	0.144	-52.11%	0.078*
Materials	-51.44%	0.000***	-119.98%	0.015**	-42.78%	0.018**	-64.76%	0.014**
Utilities	-40.94%	-	-213.18%	-	-113.13%	-	-288.51%	-

*** significant at 1%, ** significant at 5%, * significant at 10%.

Panel B Alphas in Carhart Four-Factor Model

Alpha_CHN is the intercept term of a linear regression where the dependent variables are market risk, size, book-to-market ratio and momentum. The factors are obtained from Stefano Marmi's website; the independent variable is a firm's stock market return. *Alpha_US* is the intercept term of a linear regression where the dependent variables are market risk, size, book-to-market ratio and momentum. The factors are obtained from Kenneth French's website; the independent variable is a firm's stock market return.

	Alpha_CHN		*Alpha_US*	
	mean	p-value	mean	p-value
Consumer Discretionary	-0.037	0.075*	-0.021	0.207
Consumer Staples	-0.023	0.219	-0.031	0.018**
Energy	-0.017	0.432	-0.057	0.054*
Healthcare	0.014	0.265	-0.018	0.148
Industrials	-0.015	0.255	-0.044	0.000***
Information Technology	0.016	0.362	-0.039	0.048**
Materials	-0.039	0.001***	-0.042	0.000***
Utilities	-0.065	-	-0.078	-

*** significant at 1%, ** significant at 5%, * significant at 10%.

Table 3.7 Signalling Impact of Initial Return

We use linear regression models to test the signalling impact of IPO initial return on long-term performance. The independent variables in the regressions are *Proceeds* and *Underpricing*. *Proceeds* is the natural logarithm of the total gross proceeds raised in IPO; it is a control variable. *Underpricing* is the difference between offering price and closing price on IPO day, divided by the closing price; it is a proxy variable.

Panel A Independent Variable: Buy-and-Hold Abnormal Return

The dependent variables of the linear regression models are the cumulative buy-and-hold abnormal returns; they are calculated for the time period three years after a two-stage firm's IPO. Detailed information about these abnormal returns is as follows. *BHAR_CHN_Proceeds* measures the cumulative excess investment return relative to the Chinese conventional IPOs with proceeds matching. *BHAR_CHN_MarketCap* measures the cumulative excess investment return relative to the Chinese conventional IPOs with market capitalization matching. *BHAR_US_Proceeds* measures the cumulative excess investment return relative to the U.S. conventional IPOs with proceeds matching. *BHAR_US_MarketCap* measures the cumulative excess investment return relative to the U.S. conventional IPOs with market capitalization matching.

	Model A *BHAR_CHN_Proceeds (t, t+3)*		**Model B** *BHAR_CHN_MarketCap (t, t+3)*		**Model C** *BHAR_US_Proceeds (t, t+3)*		**Model D** *BHAR_US_MarketCap (t, t+3)*	
	Coefficient	p-value	coefficient	p-value	coefficient	p-value	coefficient	p-value
Constant	0.146	0.689	-1.594	0.016**	-0.259	0.743	-0.486	0.292
Proceeds	-0.234	0.042**	0.270	0.182	-0.092	0.708	-0.070	0.624
Underpricing	0.341	0.690	-4.256	0.006***	-3.531	0.061*	-0.260	0.810
N	69		69		69		69	
R Square	0.065	0.103	0.137	0.007	0.052	0.167	0.004	0.870

*** significant at 1%, ** significant at 5%, * significant at 10%.

Panel B Independent Variable: Alpha in Carhart Four-Factor Model

The dependent variables are Carhart four-factor model alphas: *Alpha_CHN* and *Alpha_US*. *Alpha_CHN* is the intercept term of a linear regression where the dependent variables are market risk, size, book-to-market ratio and momentum. The factors are obtained from Stefano Marmi's website; the independent variable is a firm's stock market return. *Alpha_US* is the intercept term of a linear regression where the dependent variables are market risk, size, book-to-market ratio and momentum. The factors are obtained from Kenneth French's website; the independent variable is a firm's stock market return.

	Model A *Alpha_CHN*		**Model B** *Alpha_US*	
	coefficient	p-value	coefficient	p-value
Constant	-0.023	0.332	-0.044	0.013**
Proceeds	0.002	0.830	0.003	0.541
Underpricing	-0.021	0.700	-0.056	0.189
N	68		69	
R Square	0.003	0.897	0.034	0.319

*** significant at 1%, ** significant at 5%, * significant at 10%.

Table 3.8 Signalling Impact of Underwriter Reputation, CEO-Chairman Duality, Acquisition and Shares Buyback

We use linear regression models to test the signalling impact of underwriter reputation, CEO-Chairman duality, acquisition and shares buyback on long-term performance. The independent variables in the regressions are *Proceeds*, *Underwriter*, *Duality*, *Acquisition* and *Buyback*. *Proceeds* is the natural logarithm of the total gross proceeds raised in IPO. *Underwriter* is an ordinal variable; it uses a scale from one to nine to measure the ranking or reputation of IPO underwriter. *Duality* is a dummy variable; it equals 1 if CEO and Chairman is one person, and 0 otherwise. *Acquisition* is a dummy variable; it equals 1 if a two-stage firm has acquisition within three post-IPO years and 0 otherwise. *Buyback* is a dummy variable; it equals 1 if a two-stage firm has shares buybacks within three years of IPO, and 0 otherwise.

Panel A Independent Variable: Buy-and-Hold Abnormal Return

The dependent variables are three-year buy-and-hold abnormal returns. *BHAR_CHN_Proceeds* measures the cumulative excess investment return relative to the Chinese conventional IPOs with proceeds matching. *BHAR_CHN_MarketCap* measures the cumulative excess investment return relative to the Chinese conventional IPOs with market capitalization matching. *BHAR_US_Proceeds* measures the cumulative excess investment return relative to the U.S. conventional IPOs with proceeds matching. *BHAR_US_MarketCap* measures the cumulative excess investment return relative to the U.S. conventional IPOs with market capitalization matching.

	Model A *BHAR_CHN_Proceeds (t, t+3)*		**Model B** *BHAR_CHN_MarketCap (t, t+3)*		**Model C** *BHAR_US_Proceeds (t, t+3)*		**Model D** *BHAR_US_MarketCap (t, t+3)*	
	Coefficient	p-value	coefficient	p-value	coefficient	p-value	coefficient	p-value
Constant	0.872	0.091*	-1.157	0.109	-0.596	0.623	-0.728	0.271
Proceeds	-0.286	0.024**	0.059	0.796	-0.191	0.517	-0.085	0.594
Underwriter	-0.062	0.314	0.100	0.376	0.029	0.842	0.040	0.612
Duality	-0.581	0.057*	-0.628	0.257	-0.280	0.696	0.065	0.867
Acquisition	0.157	0.450	0.482	0.209	0.654	0.189	-0.157	0.558
Buyback	0.273	0.230	0.774	0.067*	0.451	0.404	0.332	0.259
N	63		63		63		63	
R Square	0.155	0.075*	0.153	0.078*	0.045	0.742	0.035	0.831

*** significant at 1%, ** significant at 5%, * significant at 10%.

Panel B Independent Variables = Alpha in Carhart Four-Factor Model

The dependent variables are Carhart four-factor model alphas: *Alpha_CHN* and *Alpha_US*. *Alpha_CHN* is the intercept term of a linear regression where the dependent variables are market risk, size, book-to-market ratio and momentum. The factors are obtained from Stefano Marmi's website; the independent variable is a firm's stock market return. *Alpha_US* is the intercept term of a linear regression where the dependent variables are market risk, size, book-to-market ratio and momentum. The factors are obtained from Kenneth French's website; the independent variable is a firm's stock market return.

	Model A *Alpha_CHN*		**Model B** *Alpha_US*	
	coefficient	p-value	coefficient	p-value
Constant	-0.033	0.317	-0.024	0.307
Proceeds	0.000	0.979	0.003	0.626
Underwriter	-0.002	0.626	-0.002	0.559
Duality	0.014	0.461	-0.021	0.151
Acquisition	-0.008	0.561	-0.004	0.682
Buyback	0.045	0.003***	0.015	0.188
N	63		64	
R Square	0.149	0.086*	0.078	0.424

*** significant at 1%, ** significant at 5%, * significant at 10%.

Table 3.9 Long-Term Stock Market Performance (Calendar-Time Portfolio)

The calendar portfolio approach constructs a time series portfolio. It starts in 2005 when the first two-stage firm conducts an IPO. Then as the time goes, more two-stage firms conduct IPOs and are included in the portfolio. Each firm stays in the portfolio for three years. Then we calculate the stock market return on the portfolio and perform linear regression with the Carhart four-factor model. The *Constant* term is the alpha. *Rm* is market return. *Rf* is risk free rate. *SMB is* the factor of small minus big. *HML* is the factor of high minus low. *MOM* is the momentum factor.

	Chinese Factors				**U.S. Factors**			
	Equal-Weighted Portfolio		**Value-Weighted Portfolio**		**Equal-Weighted Portfolio**		**Value-Weighted Portfolio**	
	coefficient	p-value	coefficient	p-value	coefficient	p-value	coefficient	p-value
Constant	-0.010	0.493	-0.012	0.950	-0.012	0.396	-0.014	0.332
Rm - Rf	0.481	0.001***	0.483	0.001***	1.778	0.000***	1.836	0.000***
SMB	-0.668	0.032**	-0.649	0.033**	0.619	0.393	0.565	0.428
HML	-0.810	0.073**	-0.609	0.167	-0.776	0.242	-0.872	0.182
MOM	0.209	0.606	0.177	0.656	0.175	0.582	0.081	0.795
R Square	0.161	0.004***	0.158	0.004***	0.238	0.000***	0.255	0.000***

*** significant at 1%, ** significant at 5%, * significant at 10%.

Table 3.10 Long-Term Stock Market Performance by GICS Sectors (Calendar-Time Portfolio)

Equal weighted and value weighted calendar-time portfolios are constructed for each of the Global Industry Classification Standard (GICS) sectors. Then we calculate Carhart four-factor alphas for each sector. These sectors include consumer discretionary, consumer staples, energy, healthcare, industrials, information technology, materials and utilities.

	Chinese Factors				U.S. Factors			
GICS Sectors	**Equal-Weighted Portfolio**		**Value-Weighted Portfolio**		**Equal-Weighted Portfolio**		**Value-Weighted Portfolio**	
	alpha	p-value	alpha	p-value	alpha	p-value	alpha	p-value
Consumer Discretionary	-0.030	0.056*	-0.030	0.034**	-0.021	0.212	-0.024	0.127
Consumer Staples	-0.010	0.588	-0.006	0.746	-0.013	0.666	-0.016	0.586
Energy	-0.036	0.478	-0.034	0.505	-0.038	0.402	-0.036	0.430
Healthcare	0.014	0.649	0.013	0.669	-0.013	0.619	-0.013	0.633
Industrials	-0.017	0.476	-0.019	0.336	-0.035	0.095*	-0.037	0.047**
Information Technology	0.003	0.853	0.006	0.652	-0.017	0.352	-0.01	0.545
Materials	-0.021	0.430	-0.023	0.402	-0.031	0.194	-0.034	0.151
Utilities	-0.065	0.007***	-0.065	0.007***	-0.078	0.001***	-0.078	0.001***

*** significant at 1%, ** significant at 5%, * significant at 10%.

Table 3.11 Operating Performance

The operating performance measures include profitability, operating capacity, debt paying ability and liquidity measures. The sample includes all the two-stage firms. The performance is reported up to three years after a two-stage firm's IPO. *TS* indicates two-stage firm sample. *Ctrl_CHN_Proceeds* refers to the Chinese conventional IPOs with gross proceeds matching. *Ctrl_CHN_MarketCap* refers to the Chinese conventional IPOs with market capitalization matching. *Ctrl_US_Proceeds* refers to the U.S. conventional IPOs with gross proceeds matching. *Ctrl_US_MarketCap* refers to the U.S. conventional IPOs with market capitalization matching.

Panel A Profitability

The profitability measures include operating return on assets, operating cash flow and sales growth. The table reports the relative performance two-stage firms over the control sample of conventional IPOs. *t+1* refers to the time period one-year after IPO. *t+2* refers to the time period two years after IPO. *t+3* refers to the time period three years after IPO.

	t+1		**t+2**		**t+3**	
	mean	p-value	mean	p-value	mean	p-value
Operating Return on Assets						
TS vs. Ctrl_CHN_Proceeds	4.26%	0.061*	-0.32%	0.839	-6.10%	0.004***
TS vs. Ctrl_CHN_MarketCap	3.59%	0.132	-1.72%	0.376	-15.12%	0.005***
TS vs. Ctrl_US_Proceeds	33.43%	0.000***	46.94%	0.051*	52.22%	0.080*
TS vs. Ctrl_US_MarketCap	9.43%	0.015**	11.68%	0.119	12.28%	0.099*
Operating Cash Flow						
TS vs. Ctrl_CHN_Proceeds	1.99%	0.537	-3.56%	0.106	-9.69%	0.004***
TS vs. Ctrl_CHN_MarketCap	2.95%	0.347	-3.55%	0.133	-18.54%	0.004***
TS vs. Ctrl_US_Proceeds	40.85%	0.000***	53.56%	0.027**	105.69%	0.078*
TS vs. Ctrl_US_MarketCap	15.99%	0.001***	22.46%	0.012**	18.54%	0.030**
Sales Growth						
TS vs. Ctrl_CHN_Proceeds	11.87%	0.381	-10.67%	0.274	-32.97%	0.000***
TS vs. Ctrl_CHN_MarketCap	13.37%	0.306	-38.20%	0.126	-37.41%	0.000***
TS vs. Ctrl_US_Proceeds	-3.97%	0.848	-78.36%	0.150	-33.52%	0.049**
TS vs. Ctrl_US_MarketCap	-9.03%	0.698	4.10%	0.695	-18.20%	0.063*

*** significant at 1%, ** significant at 5%, * significant at 10%.

Panel B Operating Capacity

The operating capacity measures include asset turnover, accounts receivables turnover, accounts payables turnover and inventory turnover. The table reports the relative performance two-stage firms over the control sample of conventional IPOs. *t+1* refers to the time period one-year after IPO. *t+2* refers to the time period two years after IPO. *t+3* refers to the time period three years after IPO.

	t+1		t+2		t+3	
	mean	p-value	mean	p-value	mean	p-value
Turnover_Total Assets						
TS vs. Ctrl_CHN_Proceeds	0.327	0.002***	0.165	0.110	-0.021	0.793
TS vs. Ctrl_CHN_MarketCap	0.242	0.019**	0.051	0.574	-0.711	0.008***
TS vs. Ctrl_US_Proceeds	0.254	0.041**	-0.027	0.838	-0.194	0.138
TS vs. Ctrl_US_MarketCap	-0.076	0.608	-0.206	0.200	-0.331	0.040**
Turnover_Accounts Receivable						
TS vs. Ctrl_CHN_Proceeds	31.488	0.166	48.323	0.271	1.772	0.691
TS vs. Ctrl_CHN_MarketCap	21.766	0.342	35.816	0.409	-22.877	0.052*
TS vs. Ctrl_US_Proceeds	34.092	0.122	47.217	0.305	-1.185	0.875
TS vs. Ctrl_US_MarketCap	27.629	0.190	43.658	0.308	-1.009	0.877
Turnover_Accounts Payable						
TS vs. Ctrl_CHN_Proceeds	25.308	0.046**	27.581	0.102	15.964	0.052*
TS vs. Ctrl_CHN_MarketCap	25.034	0.046**	28.520	0.097*	14.521	0.067*
TS vs. Ctrl_US_Proceeds	28.551	0.032**	29.595	0.110	15.938	0.099*
TS vs. Ctrl_US_MarketCap	21.788	0.095*	25.397	0.151	10.859	0.261
Turnover_Inventory						
TS vs. Ctrl_CHN_Proceeds	19.156	0.002***	14.959	0.012**	5.905	0.009***
TS vs. Ctrl_CHN_MarketCap	12.964	0.096*	9.503	0.156	-0.253	0.947
TS vs. Ctrl_US_Proceeds	20.922	0.012**	15.325	0.080*	6.449	0.083*
TS vs. Ctrl_US_MarketCap	15.057	0.039**	7.065	0.178	3.212	0.249

*** significant at 1%, ** significant at 5%, * significant at 10%.

Panel C Debt Paying Ability

The debt paying ability measures include debt leverage ratio, income coverage ratio, cash coverage ratio and time interest earned. The table reports the relative performance two-stage firms over the control sample of conventional IPOs. *t+1* refers to the time period one-year after IPO. *t+2* refers to the time period two years after IPO. *t+3* refers to the time period three years after IPO.

	t+1		t+2		t+3	
	mean	p-value	mean	p-value	mean	p-value
Debt Leverage Ratio						
TS vs. Ctrl_CHN_Proceeds	-0.091	0.025**	-0.114	0.024**	-0.075	0.219
TS vs. Ctrl_CHN_MarketCap	-0.084	0.026**	-0.097	0.045**	-0.468	0.020**
TS vs. Ctrl_US_Proceeds	-0.298	0.032**	-1.095	0.205	-1.645	0.211
TS vs. Ctrl_US_MarketCap	-0.130	0.008***	-0.157	0.005***	-0.169	0.021**
Income Coverage Ratio						
TS vs. Ctrl_CHN_Proceeds	-15.503	0.921	-18.107	0.496	-177.772	0.258
TS vs. Ctrl_CHN_MarketCap	0.376	0.998	-18.068	0.480	-17.407	0.112
TS vs. Ctrl_US_Proceeds	585.318	0.039**	161.494	0.077*	26.154	0.701
TS vs. Ctrl_US_MarketCap	-0.890	0.995	21.166	0.437	14.367	0.951
Cash Coverage Ratio						
TS vs. Ctrl_CHN_Proceeds	-136.483	0.372	-68.697	0.260	-467.868	0.309
TS vs. Ctrl_CHN_MarketCap	-70.688	0.700	-111.198	0.369	-218.871	0.333
TS vs. Ctrl_US_Proceeds	-710.330	0.071*	-219.761	0.213	-14.817	0.370
TS vs. Ctrl_US_MarketCap	14.773	0.859	-79.040	0.279	-1066.463	0.128
Times Interest Earned (TIE)						
TS vs. Ctrl_CHN_Proceeds	18.954	0.910	-14.637	0.589	-125.657	0.262
TS vs. Ctrl_CHN_MarketCap	29.994	0.838	-25.258	0.402	-30.999	0.148
TS vs. Ctrl_US_Proceeds	591.373	0.034**	148.678	0.096*	27.089	0.064*
TS vs. Ctrl_US_MarketCap	33.169	0.841	19.757	0.485	5.889	0.980

*** significant at 1%, ** significant at 5%, * significant at 10%.

Panel D Liquidity Measures

The liquidity measures include cash to current liabilities and cash to total debt. The table reports the relative performance two-stage firms over the control sample of conventional IPOs. *t+1* refers to the time period one-year after IPO. *t+2* refers to the time period two years after IPO. *t+3* refers to the time period three years after IPO.

	t+1		t+2		t+3	
	mean	p-value	mean	p-value	mean	p-value
Cash to Current Liabilities						
TS vs. Ctrl_CHN_Proceeds	1.293	0.116	0.805	0.188	1.320	0.218
TS vs. Ctrl_CHN_MarketCap	1.516	0.075*	0.875	0.149	1.237	0.249
TS vs. Ctrl_US_Proceeds	-0.359	0.728	-0.330	0.690	0.253	0.844
TS vs. Ctrl_US_MarketCap	-0.240	0.808	-0.387	0.622	0.406	0.740
Cash to Total Debt						
TS vs. Ctrl_CHN_Proceeds	1.770	0.206	0.614	0.201	0.443	0.356
TS vs. Ctrl_CHN_MarketCap	1.859	0.189	0.626	0.190	0.319	0.516
TS vs. Ctrl_US_Proceeds	0.912	0.531	0.244	0.651	0.221	0.666
TS vs. Ctrl_US_MarketCap	0.734	0.619	-0.129	0.843	0.204	0.719

*** significant at 1%, ** significant at 5%, * significant at 10%.

Table 3.12 Summary of Post-IPO Performance and Hypothesis Testing Results

Panel A Results on Long-Term Performance (three post-IPO years)

	Chinese Performance Benchmarks		**U.S. Performance Benchmarks**	
	Event-Study Portfolio	Calendar-Time Portfolio	Event-Study Portfolio	Calendar-Time Portfolio
Stock Market Performance	Significant buy-and-hold abnormal returns ranging from -50.96% to -99.15%; significant average Carhart four-factor alpha of -0.019.	Insignificant Carhart four-factor alpha ranging from -0.010 to -0.012.	Significant buy-and-hold abnormal returns ranging from -71.79% to -99.00%; significant average Carhart four-factor alpha of -0.037.	Insignificant Carhart four-factor alpha ranging from -0.012 to -0.014.
Operating Performance	Significantly lower operating return on assets, sales growth, operating cash flow and debt leverage ratio; significantly higher accounts payable turnover and inventory turnover.		Significantly lower sales growth and debt leverage ratio; significantly higher operating return on assets, operating cash flow, accounts payable turnover, inventory turnover and time interest earned.	

Panel B Results on Hypothesis Testing

	Chinese Performance Benchmarks		U.S. Performance Benchmarks	
	Event-Study Portfolio	Calendar-Time Portfolio	Event-Study Portfolio	Calendar-Time Portfolio
Faulty Risk Measurement Hypothesis	Significantly negative three-year buy-and-hold abnormal returns relative to Shanghai Stock Exchange A Share Index, proceeds matching conventional IPOs and market capitalization matching conventional IPOs, and matching firms; significantly negative Carhart four-factor alpha.		Significantly negative three-year buy-and-hold abnormal returns relative to Shanghai Stock Exchange A Share Index, proceeds matching conventional IPOs and market capitalization matching conventional IPOs, and matching firms; significantly negative Carhart four-factor alpha.	
Fads Hypothesis	Significantly negative three-year buy-and-hold abnormal returns in Consumer Discretionary, Consumer Staples, Industrials and Materials sectors; insignificant performance in other sectors	Significantly negative Carhart four-factor alpha in Consumer Discretionary sector; insignificant alphas in other sectors.	Significantly negative three-year buy-and-hold abnormal returns in Consumer Discretionary, Consumer Staples, Industrials, Materials, Energy and IT sectors; insignificant performance in other sectors	Significantly negative Carhart four-factor alpha in Industrials sector; insignificant alphas in other sectors.
Market Efficiency Hypothesis	Significant negative correlation between IPO initial return and three-year buy-and-hold abnormal return; insignificant negative correlation between IPO initial return and Carhart four-factor alpha.		Significant negative correlation between IPO initial return and three-year buy-and-hold abnormal return; insignificant negative correlation between IPO initial return and Carhart four-factor alpha.	

Panel B Results on Hypothesis Testing (cont'd)

	Chinese Performance Benchmarks		U.S. Performance Benchmarks	
	Event-Study Portfolio	Calendar-Time Portfolio	Event-Study Portfolio	Calendar-Time Portfolio
Investor Sentiment Hypothesis	Significant negative correlation between IPO initial return and three-year buy-and-hold abnormal return; insignificant negative correlation between IPO initial return and Carhart four-factor alpha.		Significant negative correlation between IPO initial return and three-year buy-and-hold abnormal return; insignificant negative correlation between IPO initial return and Carhart four-factor alpha.	
Signalling Hypothesis	Significant correlation between CEO-Chairman duality and shares buyback and firm performance (three-year buy-and-hold abnormal return and Carhart four-factor alpha); insignificant correlation between underwriter reputation and acquisition and firm performance.		Insignificant correlation between proxy variables (CEO-Chairman duality, underwriter reputation, acquisition and shares buyback) and firm performance (three-year buy-and-hold abnormal return and Carhart four-factor alpha).	
Firm Quality Hypothesis	Deteriorating operating return on assets; significantly lower debt leverage ratio.		Significantly higher operating return on assets; significantly higher time interest earned.	

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Appendix A The Timeline of the Universal Travel Group

Date	Event
	Formed under the laws of the British Virgin Island, Full Power Enterprises Global Ltd was the holding company of Yu Zhi Lu Aviation Service Company Ltd whose businesses included air tickets booking, hotel booking, and tour routing for customers throughout China.
2006-7-12	Full Power Enterprises Global Ltd merged with TAM of Henderson (OTCBB: TMHN) via a reverse takeover transaction. After the transaction, the shareholders of Full Power Enterprises Global Ltd effectively controlled the surviving entity that was traded publicly under the name of TAM of Henderson.
2006-8-23	Tam of Henderson changed name to Universal Travel Group (OTCBB: UTVG).
2006-11-16	Ludlaw Capital Group initiated research coverage on Universal Travel Group.
2007-2-14	Universal Travel Group secured $0.5 million loan from Shenzhen Commercial Bank.
2007-4-10	Universal Travel Group acquired Speedy Dragon Enterprise.
2007-8-6	Universal Travel Group acquired Xi'an Golden Net.
2007-8-8	Universal Travel Group acquired Shanghai Lanbao Travel Service.
2007-10-29	Universal Travel Group acquired Foshan Overseas International Co. Ltd.
2007-12-3	Universal Travel Group acquired Tianjin Golden Dragon International.
2008-7-29	Universal Travel Group closed a $4.8 million PIPE financing.
2008-9-3	Universal Travel Group closed a $7.11 million PIPO financing.
2008-12-3	Dutton Associates initiated coverage on Universal Travel Group.
2008-12-4	Universal Travel Group closed a $3.5 million PIPE financing.
2009-2-23	Universal Travel Group hosted "Virtual Retail Road Show" to provide the public investors with the access and insight into corporate strategy and market outlook.
2009-5-28	Universal Travel Group transferred from OTC Bulliton Board to American Stock Exchange (AMEX) under the trading symbol of UTA.
2009-6-18	Emissary Capital Group initiated coverage on Universal Travel Group.
2009-11-16	Universal Travel Group transferred from American Stock Exchange (AMEX) to New York Stock Exchange (NYSE) under the trading symbol of UTA.
2009-12-15	Universal Travel Group issued $20 million common shares to institutional investors via registered direct offering. Brean Murray, Carret & Co., LLC acted as the placement agent. Offering price was $9.00 per share. First-day return (underpricing) was 11.67%.
2010-1-19	Universal Travel Group acquired Hebei Tianyuan Travel Agency.
2010-1-26	Universal Travel Group acquired Zhengzhou Yulongkang Travel.
2010-03-26	Huangshan Holiday Travel Service Company
2010-6-16	Universal Travel Group completed $20 million IPO. Brean Murray, Carret & Co., LLC acted as book running manager, Rodman & Renshaw, LLC acted as the co-manager. The

Date	Event
	offering price was $7.00 per share, underwriter discount was 7%, underpricing was 11.14%; first-day return was 0.14%.
2010-9-1	Universal Travel Group dismissed Acqavella, Chiarelli, Shuster, Berkower & Co., LLP, and appointed Goldman Kurland Mohidin, LLC as the independent auditor.
2010-9-30	Universal Travel Group appointed Windes & McClaughry Accountancy Corporation as the independent auditor to replace Goldman Kurland Mohidin, LLP.
2011-4-9	Universal Travel Group's independent auditor, Windes & McClaughry Accountancy Corporation resigned.
2011-4-14	Universal Travel Group appointed EFP Rotenberg & Co, LLP as independent auditor to take over from Windes & McClaughry Accountancy Corporation.
2011-04-16 to 2011-05-12	A group of law firms including Law Offices of Howard G. Smith, The Rosen Law Firm, Goldfarb Branham Law Firm LLP, Rigrodsky & Long, P.A., Robbins Umeda LLP, Glancy Binkow & Goldberg LLP, Cohen Milstein Sellers & Toll PLLC, announced class action lawsuit against Universal Travel Group.
2012-5-9	Universal Travel Group voluntarily delisted from New York Stock Exchange and started to trade on the OTC Pink.

Appendix B List of Two-Stage Firms

#	Year of IPO	Name
1	2005	Cogo Group
2	2006	Bodisen Biotech
3	2006	SORL Auto Parts
4	2007	American Oriental Bioengineering
5	2007	HQ Sustainable Maritime Industries
6	2007	Harbin Electric
7	2007	China Architectural Engineering
8	2007	China Precision Steel
9	2007	China Shenghuo Pharmaceutical
10	2007	Longtop Financial Technologies
11	2008	China Bak Battery
12	2008	Agfeed Industries
13	2008	Asia Time
14	2008	ChinaCast Education Group
15	2008	Highpower International
16	2009	China Natural Gas
17	2009	China Security & Surveillance Technology
18	2009	Funtalk China
19	2009	Wonder Auto Technology
20	2009	CD International Enterprises
21	2009	China Education Alliance
22	2009	General Steel Holdings
23	2009	Zhongpin
24	2009	China Integrated Energy
25	2009	China Ritar Power Corp
26	2009	China-Biotics
27	2009	Yongye International
28	2009	Advanced Battery Technologies

#	Year of IPO	Name
29	2009	China Gerui Advanced Materials Group
30	2009	China Green Agriculture
31	2009	China North East Petroleum
32	2009	China Valves Technology
33	2009	Deer Consumer Products
34	2009	Duoyuan Printing
35	2009	NIVS IntelliMedia Technology Group
36	2009	QKL Stores
37	2009	SkyPeople Fruit Juice
38	2009	Skystar Bio-Pharmaceutical
39	2009	SmartHeat
40	2009	ZST Digital Networks
41	2010	Winner Medical Group
42	2010	Fushi Copperweld
43	2010	China Agritech
44	2010	China GengSheng Minerals
45	2010	China Information Technology
46	2010	Sutor Technology Group
47	2010	Telestone Technologies
48	2010	China Marine Food Group
49	2010	China TransInfo Technology
50	2010	China Yida Holding
51	2010	Puda Coal
52	2010	Shengkai Innovations
53	2010	Yuhe International
54	2010	Universal Travel Group
55	2010	China Advanced Construction Materials Group
56	2010	China Electric Motor
57	2010	China Intelligent Lighting and Electronics

#	Year of IPO	Name
58	2010	China Jo-Jo Drugstores
59	2010	China Shengda Packaging Group
60	2010	China XD Plastics Company
61	2010	Kandi Technologies
62	2010	Orient Paper
63	2010	Ossen Innovation
64	2010	Sino Clean Energy
65	2010	Sinovac Biotech
66	2010	China Ceramics
67	2010	Zoom Technologies
68	2011	China Shen Zhou Mining & Resources
69	2011	SinoHub
70	2011	Kingold Jewelry
71	2012	You On Demand Holdings

Appendix C Development of the Chinese Domestic Equity Market

C.1 History of the Chinese Capital Market

The emergence of the Chinese securities market can be traced back to the 19th century when China was under the reign of the Qing Dynasty. After losing a series of wars against the western capitalism countries, the Qing Dynasty started to learn from its western opponents by introducing capitalism into China. In 1872, a shipping business became the first incorporated company in China. Then a military government who succeeded the Qing Dynasty passed Securities Exchange Law and built two securities exchanges in Beijing and Shanghai from 1914 to 1920. More securities exchanges were built in the cities of Qingdao and Tianjin in later years. But all these securities exchanges were shut down during the World War II. After the Communist Party won the civil war (1945 – 1949) against the Nationalist Party, securities exchanges in China were re-opened. However, the prevailing socialism caused securities trading volume to continue to drop. Eventually, all the securities exchanges were in significant deficit and had to close out in 1952.

The recent development of the Chinese securities market is a result of the government's decision to adopt a market-oriented economic model. From 1978 to 1990, RMB 4.5 billion worth of stocks were issued to the public through private placements. Because there was no securities exchange in China, stocks could be traded only privately or through over-the-counter transactions. Then in a national finance conference in 1984, fourteen scholars called for the re-open of the Chinese securities market; but most of the other participants disagreed with this proposal. At the time when the debate continued to be fierce in academia, many Chinese

enterprises also explicitly indicated the need for a securities market. Eventually, in December 1990 and July 1991, Shanghai Securities Exchange and Shenzhen Securities Exchange came into operation: the former aims to trade the stocks of private companies; the later aims to trade the stocks of state-owned enterprises (SOEs). In 1993, a group of good quality companies were allowed to issue B shares to the foreign investors and H shares on the Hong Kong Securities Exchange. In 2004, Exchange Traded Funds (ETF) and mutual funds were introduced to the retail investors. From 2006 to 2011, the total number of publicly traded companies in China had grown from 1341 to 2273. By the end of August 2011, the total market capitalization of the companies in Shanghai and Shenzhen securities exchanges was RMB 25.5 trillion. There were 109 securities brokers, 66 mutual fund families, and 130 million public investors in China. The Chinese securities market is dominated by retail investors. Institutions and foreign investors only account for less than 25% of the market capitalization, compared with more than 60% in the U.S. (Zhang and King, 2008).

C.2 Development of the Chinese IPO Market

The Chinese IPO market features political influence. Per CRSC, a public company in China is eligible to issue four types of shares: A-shares to the Chinese domestic investors, B-shares to the foreign investors in China, H-shares on Hong Kong Stock Exchange, and N-share on NASDAQ, NYSE, and AMEX. A typical IPO for an A-share issuance takes approximately 260 days (Su and Fleisher, 1997). Before 1994, a lottery mechanism was used to allocate A-shares. Since 1994, two auction mechanisms have been introduced. Issuers of B-shares must have stable source of foreign income and must get approval from the relevant authorities before

using their foreign capital. Foreign underwriters are allowed to participate into B-share issuance process. Prior to 1999, issuers of both A-shares and B-shares were subject to a quota restriction: the State Planning Committee, the People's Bank of China (the central bank), and CSRC determined the total amount of new shares to be issued to the public, then a quote was set up and distributed to the individual provinces. [68] Provincial authorities selected the private firms who requested for public listing based on the criteria such as operating performance and long term development objectives. Priorities were given to the protective industries including petrochemicals, energy, and raw materials where firms are usually large monopolies under the direct supervision of the State Council. Firms in the unprotected industries had to compete openly for the limited amount of quote set for public listing (Aharony et al., 1999). In 2000, the IPO quota system was replaced with a verification and approval system: private firms requesting for public listing needed to get recommendation from major securities firms. But the number of the IPOs in the Chinese domestic market was still subject to political constraints (Sun et al., 2008). For each year, a securities firm could recommend up to four firms for IPOs. Once a private firm had the recommendation, it should start a restructuring process which usually took at least a year. Then a review committee consisting of CSRC's internal professionals and external specialists confirmed that the private firm was ready for launching an IPO. The Economic Daily reported that by June 2002, there were more than a thousand Chinese firms who had completed the restructuring process and waited for launching IPOs. [69] Starting in 2005, the verification and approval system transferred to a registration system in which underwriters were given more rights. Book building was also introduced to the IPO

[68] In 1996, the quota restriction was changed from quantity of equity to number of issuers. Issuers of H-shares and N-shares are approved on case-by-case basis and are not subject to quota restriction.

[69] The Economic Daily, June 20, 2002

process to determine share price and reflect more investor demand and less government intention. Nonetheless, the Chinese domestic stock market is still highly speculative; it is not the best candidate for the issuers looking for long term capital market stability (Zhang and King, 2008).

Appendix D Choice of Listing Location and Two-Stage Firm's Country Risk

D.1 Introduction

It has been reported that two-stage strategy is viable in both Hong Kong Stock Exchange[70] and Singapore Stock Exchange. [71] The two stock exchanges are the first choices for Chinese companies for foreign listing. Yet our sample of two-stage firms chooses to list in the U.S. In this appendix, we review the previous studies to explain two-stage firm's choice of listing location. We also discuss two-stage firm's country risk perceived by the U.S. investors, its impact on IPO underpricing and the risk mitigation. We aim to close the loop of the discussion on two-stage firm's underpricing and provide the audience with some thoughts on two-stage firms from a foreign listing perspective. As empirical research on listing location and country risk is not the focus of our study, we don't further test the theories and hypotheses in this appendix.

D.2 Two-Stage Firm's Choice of Listing Location

When it comes to choose a foreign listing location, a firm needs to consider not only the rules and regulations in the listing location, but also the characteristics of the listing location's capital market and investors. Hursti and Maula (2007) found that foreign venture capital and international experience increase the likelihood of listing on a foreign stock exchange. Pagano et al. (2002) found that listing abroad is a way of capitalizing on the reputation acquired through the presence on foreign product markets. A firm's size and proportion of foreign sales

[70] http://www.hg.org/article.asp?id=19613
[71] http://www.kcpartnership.com/resources/publication/Listing%20in%20Singapore.pdf

have significant impact on the decision on foreign listing. Saudagaran and Biddle (1992) found that the probability of listing on a foreign exchange is positively related to a firm's export to that country and negatively related to a securities exchange's disclosure requirements. Cogman and Poon (2012) summarized that a firm usually considers three factors of foreign listing: (a) cost of establishing and maintaining the listing; (b) the effect on valuation and liquidity; and (c) the nonfinancial benefits. They argued that the cost of listing in the top-tier stock exchanges[72] is not significantly different; there is also no significant evidence showing that listing on these exchanges brings advantageous valuation or liquidity. Hence, it is the nonfinancial benefits[73] that determine a firm's foreign listing location. Subrahmanyan and Titman (1999) argued that in order to reduce the cost of information transfer, firms prefer to list in the large capital market or the capital markets where a large number of similar firms are already listed. Location of analysts with superior knowledge of the industry also determines listing location; the objective is to find a listing location that best understands a firm's business. For example, the U.S. investor community understands technology firms, the Canadian and Australian investor communities understand early-stage mining firms. Fanto and Karmel (1997) argued that listing in the U.S. can provide foreign issuers with something they cannot obtain from their home exchanges, such as the comparison with industry competitors, the attention from sophisticated investors and analysts, and the improved ability to raise capital for certain industries. Blass and Yafeh (2001) argued that the U.S. capital markets are able to identify the firms with future superior performance.

[72] The exchanges are Euronext, Hong Kong Stock Exchange, London Stock Exchange, NASDAQ, and NYSE.
[73] The nonfinancial benefits include ease of access, regional proximity, and the expertise of the analyst and investor community.

When Chinese firms seek overseas listing opportunities, they usually consider several factors: (a) the strict legal and accounting standard in foreign countries, (b) stringent listing and disclosure requirements of foreign exchanges, (c) significant supply of capital, (d) expanded shareholder base, and (e) foreign expertise (Zhang and King, 2008). The degree of foreignness also has an impact. Due to geological preference, cost of offering and language barrier, Hong Kong Stock Exchange and Singapore Stock Exchange are the first choices for the Chinese firms: 59% of the Chinese foreign listing firms are on the two exchanges, compared with 27% listing in Europe and 14% listing in the U.S. Singapore Stock Exchange is attractive to small, high-leverage and non-high-tech Chinese firms due to its lower listing requirement on size. Large, low-leverage, and high-tech Chinese firms tend to list on Hong Kong Stock Exchange. By the end of 2005, Chinese firms account for 15% of total trading volume and 6% of total market value on Singapore Stock Exchange, 56% of total trading volume and 46% total market value on Hong Kong Stock Exchange. Strong evidence indicates that the Chinese foreign listing firms aim at external capital rather than expanded shareholder base. Unfortunately, we haven't found any evidence on the underpricing of Chinese IPOs on these two stock exchanges.

It is interesting to find that while many Chinese firms consider Hong Kong and Singapore as the first choice of listing location, two-stage firms choose the U.S. There are several hypotheses that may explain this. The market segmentation hypothesis states that listing in the U.S. could reduce transaction cost, information asymmetry, and barriers to foreign investors. The investor recognition hypothesis suggests that firms neglected in home markets have large incentive to list in the U.S. In such a way, they could increase their shareholder base, widen

the clientele for their shares, improve risk sharing, and reduce the cost of capital (Merton, 1987). According to the bonding hypothesis, by bonding itself to the U.S. securities regimes, a foreign firm from a jurisdiction featuring weaker minority shareholder protection could signal its desire to protect shareholder rights (Coffee, 1999, 2002; Stulz, 1999). By selecting a tightly regulated foreign exchange, the firm also signals its ability to adhere to high standards of corporate governance and disclosure. There is empirical evidence supporting these hypotheses. Fuerst (1998) and Cheung and Lee (1995) found that if stock exchanges are different in terms of regulations and disclosure requirements, listing in the exchange with more rigorous rules could serve as a signal of firm quality. Pagano et al. (1999) argued that listing in the U.S. could reduce the barrier to the U.S. investors and improve a firm's reputation in product market. Foreign firms listing in the U.S. tend to label themselves as "American" even when their main business activities are off-shore. In such a way, foreign firms signal a better firm reputation and quality of products (Rock, 2002). Allen (1993) and Allen and Gale (1999) reported that the U.S. equity market is able to evaluate future growth and earnings prospects of innovative firms; the Wall Street underwriters' involvement into a public offering process provides a "stamp of approval" to signal the quality of a foreign firm. High-quality innovative firms prefer to list in the U.S. to reveal their value and differentiate themselves from the issuers in their home markets. Pagano et al. (2002) reported that firms choose to list in the US and Europe for different reasons. Listing in the U.S. is prompted by the need to fuel rapid expansion via new equity issues, while listing in Europe is driven by the purpose of increasing debt capacity; the former is to finance growth, the latter is to improve financial stability. Blass and Yafeh (2001) found that young firms prefer to list in the U.S. because the U.S. investors

focus on growth potential, while the European investors focus on return history. All these hypotheses indicate that two-stage firms are motivated to list in the U.S.

But the benefit of listing in the U.S. also comes with significant cost. Choudhary (2010) identified four impediments to accessing the U.S. equity market: (a) disclosure requirements; (b) accounting reconciliation; (c) cost of listing; and (d) fear of liability. Fanto and Karmel (1997) argued that the main cost of listing in the U.S. is the cost of complying with the U.S. GAAP accounting standards and the risk of lawsuits. Leon (2007) reported that compliance with the Sarbanes-Oxley Act of 2002 (SOX) is extremely costly: the average auditing cost for S&P Small Cap Index (S&P 500 Index) firms had increased from $0.34 million ($1.53 million) in 2001 to $1.34 million ($4.4 million) in 2005. The Committee on Capital Market Regulation reported that in 2004, the average cost of implementing SOX section 404 was $4.36 million per company. Moreover, listing in the U.S. could cause controlling shareholders and top managers to lose benefit. Langevoort (2008) argued that a stricter regulatory regime would keep controlling shareholders away from extracting private benefits of control. Doidge et al. (2005) reported that firms are less likely to list in the U.S. when their controlling shareholders' control rights exceed their cash flow rights. Reese and Weisbach (2001) found that managers of the firms from low-protection countries are reluctant to list their firms in the U.S. due to the concern about reduction in their private benefits.

D.3 Country Risk and Underpricing of Two-Stage Firms

Like many other foreign firms in the U.S., when two-stage firms conduct IPOs, they may have to underprice their shares to compensate for information asymmetry and country risk. The problem of limited information availability may be severe for two-stage firms since they are relatively young and unknown (Hursti and Maula, 2007). In addition, valuation problem would also arise due to the factors including culture difference, analyst coverage, security threats, political uncertainty, inflation rates, and the macroeconomic and institutional environment of China. Hymer (1960) called it "liability of foreignness". Other studies refer it as country risk. It adds uncertainty to foreign firm valuation and causes higher underpricing. The average underpricing of the foreign conventional IPOs in the U.S. is 21.5% compared with the average of 18.8% for the U.S. domestic IPOs (Kadiyala and Subrahmanyam, 2002). Firms from low economic freedom and segmented markets tend to underprice their shares at an even higher level (Bell et al., 2008; Francis et al., 2008). On the flip side, there is an argument that the "foreignness" of two-stage firms can help alleviate underpricing. The low correlation of returns between China and developed markets provides diversification benefits to the U.S. investors, making two-stage firms more attractive (Harvey, 1995). Besides, as scarcity of fund is the usual reason that emerging market firms cannot grow to their full potential, the funds raised in the U.S. would increase capacity and boost productivity for two-stage firms. Thus, an IPO by a two-stage firm may signal good business outlook and lead to increasing demand for the firm's shares. The evidence on the emerging market ADR IPOs provides a reference from this perspective. Ejara and Ghosh (2004) found that controlling for size and industry effects, the emerging market ADR IPOs are less underpriced by 10.9% than the developed market ADR IPOs. Unfortunately, we haven't found empirical evidence on the underpricing of the Chinese ADR IPOs.

Many factors may help a foreign firm reduce underpricing in the U.S. Bruner et al. (2004) found that foreign IPOs often use unique firm characteristics[74] and market timing to serve as a signalling mechanism to mitigate country risk and information asymmetry: these firms are larger, have higher portion of tangible assets, and most of them are from developed countries and the countries sharing geographic proximity, language, and culture with U.S[75]. The foreign IPOs are also frequently in telecommunication, oil and gas sectors; their operating business tend to be associated with the established industries (manufacturing, machinery, processing) and known technology (long distance telephones). Median size of the foreign IPOs in pre-issue assets is $64 million; the median equity capital raised through IPO is $49 million. This compares to the median size and gross proceeds of $21 million and $31 million for the U.S. domestic IPOs. Foreign IPOs issue equities in the U.S. following a period of strong home equity market performance and stable currency conditions.

Pagano et al. (2002) found that in order to reduce information asymmetry, firms tend to list in the countries either geographically or culturally close to their home countries; for example, Canadian, Latin American, and Israeli IPOs tend to list in the U.S., South African and Asian IPOs tend to list in London, Japanese firms are likely to list in Frankfurt. The mitigated country risk and reduced liability of foreignness would help reduce the level of underpricing. Hasan and Waisman (2010) reported that the U.S.-listed Israeli IPOs usually have products, licensing or franchising relationships, or venture capital funds in the U.S. prior to IPO; they are willing to present themselves as "American" to attract foreign investors and acquirers. Bell et al.

[74] Such as size, age, and international familiarity.
[75] 237 foreign IPOs are from Israel, Canada, UK, Mexico, Hong Kong, Holland, and France.

(2008) argued that large international scope of operation and acceptable level of retained ownership help emerging market IPOs overcome the country perceptions. Choudhary (2010) reported that large Indian firms prefer to list in U.S. because their major business operations are already in the U.S. These Indian firms can take advantage of the liquidity benefits, prestige of exchange and reputational gains. Makela and Maula (2005) argued that foreign venture capitalist help reduce their portfolio company's liability of foreignness; foreign venture ownership also forces the portfolio company to operate more internationally than the companies with pure domestic ownership. Merton (1987) found that investors are more interested in the securities of the firms they are more informed about; the seasoned and mature firms tend to be less underpriced because investors have more information on them. For example, the average underpricing of emerging market and developed market ADR IPOs are 5.67% and 16.56%, significantly less than the 27.01% for the comparable U.S. domestic IPOs with the same size and industry (Ejara and Ghosh, 2004).

Overall, the IPO and cross-listing literature suggests that foreign firms are large, mature, and have connections with the U.S. through culture, language, geography, venture capital, or products, so that they can reduce underpricing in their IPOs. But the two-stage firms in our study do not have these characteristics. Firstly, two-stage firms don't have overseas business operations and are unknown to the U.S. investment community. Their headquarters are in China which doesn't share a common language and is not geometrically or culturally close to the U.S. Thirdly, because two-stage firms tend to be small and young firms at development stage, their firm-specific characteristics can hardly help mitigate country risk and information asymmetry. We argue that two-stage firms don't rely on the traditional ways that many foreign

IPOs use to reduce underpricing. Instead, they use a two-stage strategy by going public before issuing public equities. In such a way, they could have a trading history and start to disseminate accounting information to the public prior to IPOs. This is consistent with the hypothesis in previous studies that found information asymmetry problems are less severe for the foreign firms that already have a trading history (Rock, 1986; Reneveniste and Spindt, 1989; Kadiyala and Subrahmanyam, 2002). It's also consistent with the findings in Merton (1987) in that investors are more interested in the securities of the firms they are more informed about. We argue that a two-stage strategy helps mitigate country risk and information asymmetry.

Appendix E Summary of Key Papers

Author	Sample	Period	Key Findings and Conclusions
Adjei et al. (2008)	286 US reverse merger firms and 2860 conventional IPOs on NASDAQ, NYSE, and AMEX	1990 - 2002	Private firms conducting reverse merger are smaller, younger, and have poorer ex ante performance on average than the conventional IPOs. The mean total assets value for reverse merger firms is $136.3 million comparing to $674.9 million for the matching conventional IPOs. The mean firm age at the time of going public is 7.9 years for reverse merger firms and 13.3 years for the matching conventional IPOs. Within 3 years of listing on the exchange, 52% of the reverse merger firms are delisted comparing to 27% for the matching conventional IPOs. The most probable delisting time of an average reverse merged firm is in the 24th month with a 5.69% probability of delisting. Financial analysts contend that reverse mergers are a back door to going public and private firms using reverse mergers are inferior to those using conventional IPOs.
Aharony et al. (1999)	83 Chinese SOEs issued B-shares or H-shares	1992 - 1995	The Chinese firms in protected industries are large monopolies under the direct supervision of the State Council and receive relatively favorable treatment in accessing equity market; they operate more like a government agency than a commercial enterprise. Firms in unprotected industries have to compete openly for the listing privilege and have a higher profitability requirement for listing. Post-issue earnings decline significantly for unprotected industry firms, indicating that the SOEs in unprotected industries may manage accounting accruals to boost earnings. To attract international investors for their IPOs, many SOEs only list their profitable business units for public offerings and keep the non-productive and unprofitable units in the state-owned entity. As the controlling shareholder, the parent SOE may boost the earnings of its listed subsidiary in the year of IPO, then siphon back these profits in future years. H-share companies are larger and more likely to be protected than B-share companies.
Aharony et al. (2009)	185 Chinese IPOs listed on the Shanghai Stock Exchange	1999 - 2001	Chinese parent companies use opportunistic tunneling tool. There is an association between tunnelling behavior in post-IPO period and earnings management via abnormal related-party sales in pre-IPO period. But the Chinese investors fail to perceive the link between the two phenomena in the Chinese IPOs. The Chinese capital markets do not fully and rapidly impound information into share prices when the information on related-party transactions is published in IPO financial reports. Three industry groups (the Basic industries, the Consumer Durables industries and the Capital Goods industries) have a higher proportion of IPOs. Mean (median) total proceeds from Chinese IPOs are RMB572.59 (400.79) million.

Author	Sample	Period	Key Findings and Conclusions
Ang et al. (2014)	114 ADR IPOs and 114 reverse mergers on NASDAQ, NYSE, AMEX	2001 - 2011	Good and bad US-listed Chinese firms have no significant difference in operating capability, debt-paying ability and cash creation ability. Financial fraud committing companies use earnings management to make profits look better than they really are, they are inherently of lower quality and have more to hide, thus are more likely to employ less-prestigious audit firms, investment banks and law firms to provide listing service. Venture capital investment does not significantly reduce the likelihood of fraud. Entrepreneurs' trustworthiness in provinces where bad apple companies' headquarter are located are significantly lower than those of good apple companies. The average ownership of the largest shareholders in bad apple companies is 49%, significantly higher than that of good apple companies which is only 43%. 59% of bad apple companies went public through reverse merger, only 37% of good apple companies do so.
Bai and Zhang (2004)	341 Chinese IPOs	1998 - 2000	The Chinese domestic IPOs outperformed their matching firms by 3% in one aftermarket year, 5% in two aftermarket years, and 1% in three aftermarket years. Fama-French model would show significantly positive alpha in one and two aftermarket years; alpha in three years is not significantly different from zero.
Bell et al. (2008)	105 foreign IPOs listing on NYSE and NASDAQ	1997 - 2004	IPOs from the countries with government policies and institutional practices that protect the economic freedom of its citizens are significantly less underpriced than IPOs from the countries with lower level of economic freedom. Increasing international scope of operations and retaining acceptable levels of ownership can help firms from emerging economies overcome the negative country perceptions associated with lower levels of legitimacy.
Blass and Yafeh (2001)	219 Israeli industrial and software firms: 163 conducted IPO in Israel, 56 conducted IPO in US	1990 - 1996	All firms that listed in Israel satisfied the NASDAQ pre-issue listing requirements, but not all of them choose to list in U.S. High-quality innovative firms are willing to incur additional cost associated with listing in U.S. in order to reveal their value and distinguish themselves from the firms in home market. Cost of listing in the US include underpricing and relinquishing corporate control; shareholders of Israeli firms that do not list in Israel may have to forgo part of the available exemptions from capital gains tax. The Israeli IPOs in US are younger than home market IPOs and have high R&D intensity; they raise more funds through IPOs. The average ratio of exports to sales among the Israeli IPOs in U.S. is three times larger than for home market IPOs. In the first year after IPO, the median Israeli IPOs in U.S. increased its revenue by 55%, while the home market IPO's revenue only increased by 17%. Average underpricing of Israeli IPOs in U.S. is 20%, while IPOs in Tel Aviv Stock Exchange usually have zero underpricing.

Author	Sample	Period	Key Findings and Conclusions
Brown et al. (2010)	200 Australian reverse merger firms. Only non-financial companies are included.	1992 - 2007	Reverse merger transactions represent 10.8% of all the going-public transactions on Australian Stock Exchange. Comparing to the conventional IPOs, reverse merger firms have lower balance sheet liquidity, less profitable and more at development stage; they are more heavily concentrated in the high-tech sectors. Reverse merger transactions generally take a longer duration to complete than IPOs (153 days vs. 92 days); they are associated with more cashing-out activity and lower retained ownership by private firm owners (52.8% vs. 64.9%). Reverse merger firms also raised smaller proceeds than their conventional IPO counterparts ($4.08 million vs. %8.66 million) and are less likely to engage the service of underwriter (31.4% vs. 64.4%). Underpricing for reverse merger firms and conventional IPOs is not significantly different (7.5% vs. 11%).
Bruner et al. (2004)	371 foreign IPOs in US, including Level III ADRs and excluding financials and utilities, and cross-listing firms	1990 - 1999	Median U.S. IPOs have $21 million in pre-issue assets and raise $31 million in equity capital, while the median foreign IPOs have $64 million in pre-issue assets and raise $49 million in equity capital. On average, foreign IPOs experience similar costs as the U.S. domestic IPOs. The risk of foreign IPOs arising from information asymmetry and country risk is offset by certain firm-specific characteristics such as greater size, asset tangibility, and geographic proximity. These characteristics reduce their risk relative to the domestic U.S. IPOs. Foreign IPOs in U.S. tend to be larger firms with more tangible assets and originate from countries sharing a common border and language with the US. The foreign IPO issuance usually follows period of strong home market equity performance and stable currency conditions because this would help alleviate country risk. Large majority of foreign IPOs come from the countries with geographic proximity, shared language, and culture with U.S. Foreign IPOs occur more frequently in telecommunications, oil, and gas, and less frequently in services and retailing; they are more frequently associated with investments in established industries (manufacturing, machinery, processing) and known technology (long distance telephones).

Author	Sample	Period	Key Findings and Conclusions
Carpentier et al. (2010)	1024 IPOs and 1384 reverse merger on TSX and TSVX	1993 - 2003	In Canada, regulators allow easy access to the market via reverse mergers. New listings are divided almost equally between reverse merger firms and conventional IPOs. Both conventional IPOs and reverse merger firms are overpriced, as evidenced by the long run underperformance of both groups of issuers. Within three aftermarket years, the median raw return is -31.76% for conventional IPOs and -54.08% for reverse merger firms; the median abnormal return is -70.81% for conventional IPOs and -103.78% for reverse merger firms. Biases, including overconfidence and over-optimism, are likely to be larger for reverse merger firms and conventional IPOs. But conventional IPOs have less negative long-term returns. The analysis on self-selection problem indicates that lower quality firms opt for the less regulated reverse merger to obtain public listing. Reverse merger firms are smaller; more often exhibit negative earnings, and often do not have revenues. Because the timely disclosure and rigorous process associated with the conventional IPOs are more informative, the earnings multiple obtained through conventional IPOs are twice that observed for reverse merger firms.
Certo (2003)			Boards have a symbolic role that is independent of the board's tangible activities. Investor perceptions of board prestige signal organizational legitimacy and would reduce the liability of market newness and improve IPO firm's stock performance. Directors with high levels of education or directors who attended prestigious educational institutions may influence investor perceptions of board prestige. Board affiliations with prestigious clients or suppliers may contribute to investor perceptions of board prestige.
Choudhary (2010)	137 Indian firms that list on offshore exchanges: 92 on Luxembourg Stock Exchange, 24 on London Stock Exchange, 10 on New York Stock Exchange		There are four impediments to accessing the U.S. capital market: (1) disclosure requirements; (2) accounting reconciliation, (3) cost of U.S. listing, (4) fear of liability. Rule 144A transaction acts as perfect substitute for public offing in U.S. It permits foreign issuers to raise capital without registering the offering with the SEC and free of most of the US regulation, including liability under Securities Act of 1933 and the Sarbanes-Oxley Act of 2002. Most of the primary market offering in India is marketed and sold to U.S. investors through Rule 144A transactions. The benefit of Rule 144A transactions: (1) capital infusion, (2)increased liquidity, (3) reputation and prestige attached to oversea listing.

Author	Sample	Period	Key Findings and Conclusions
Cogman and Poon (2012)			The three factors when companies consider listing location are: (a) the actual out-of-pocket cost for establishing and maintaining the listing; (b) the effects on valuation and liquidity; and (c) the nonfinancial benefits. Costs of listing on the top-tier stock exchanges (Euronext, the Hong Kong Stock Exchange, the London Stock Exchange, NASDAQ, and NYSE) differ slightly. Also, there is limited evidence that any of the major global exchanges brings an advantage in valuation or liquidity. Some argue that listing in major exchange increases exposure to a broader analyst and investor community and better price discovery of shares. But evidence shows that median company sees its liquidity fall by 37% when they add a second listing in Hong Kong, P/E ratio of these companies is also 24% lower than the ratio in the original listing location. Therefore, nonfinancial benefits is the most important factor when a firm considers foreign listing. It includes ease of access, regional proximity, and the expertise of the analyst and investor community in a specific location, are compelling enough to prefer one exchange over another. The logic is to seek out the location that best understands a company's business; for example, technology companies may feel better understood by the U.S. investor community, early-stage mining companies by the Canadian investor community.
Derrien and Kecskes (2007)	119 firms on LSE through listing by introduction	1995 - 2004	The two-stage offering strategy is less costly than an IPO (IPO) because trading history reduces the valuation uncertainty before equity issuance. Initial returns are 10% to 30% lower for these firms than for comparable IPOs. These firms time the market both when they list and when they issue equity. With rough approximation, a conventional IPO is almost 40% more expensive than the two-stage strategy. Firms go public via the two-stage strategy time the market twice, namely, when they list and when they issue equity. In cold markets, two-stage firms substitute introduction for IPOs. Moreover, two-stage firm's equity offerings occur at the beginning of IPO waves. This suggests that being already listed allows two-stage firms to exploit favorable market conditions faster than IPOs. Also, two-stage firms at offering are about the same size as IPOs; two-stage firms and IPOs are comparably profitable.

Author	Sample	Period	Key Findings and Conclusions
Ejara and Ghosh (2004)	284 ADR IPOs, excluding units, warrants and rights offerings	1990 - 2001	ADRs are offered by large and well-known multinationals; ADR IPOs incur significant costs in pre-IPO period to recast financial statements in conformity with SEC rules and the U.S. GAAP. This mitigates the information asymmetry between IPO firm and investors. ADR IPOs are significantly less underpriced than comparable US IPOs. The average ADR IPO issue ($427.28 million) is about four times larger than the average U.S. domestic IPO ($113.68).The average size of the underwriting syndicate for ADR IPOs is bigger than that for US domestic IPOs. The average rank of underwriters with the ADR IPOs is higher than that of the U.S. IPOs. The underwriting fee as a percentage of offering price for US IPOs is close to 7%, while that for ADR IPOs is slightly over 5%. Average age of ADR IPOs is 26 years, comparing to 13 years for the U.S. IPOs. The average underpricing for all ADR IPOs is 12.34%, is 27.01% for the US IPOs. Among the emerging markets, Mexico, Chile, and China account for the largest number of ADR IPOs, and most capital by far is raised by China ($24.5 billion). For all holding periods up to first six months, ADR IPO, U.S. IPO, and the matching firms outperform the S&P 500 index. Over the two-year period, ADR IPOs performed worse than the U.S. domestic IPOs who closely match that of the market. Both ADR IPOs (45.56%) and U.S. IPOs (62.90%) significantly underperform the market index (68.17%) over 3 aftermarket years. Even if ADRs trade in U.S. dollars, their performance is impacted by the rate of change in the value of their domestic currency.
Francis et al. (2008)	413 foreign IPOs in the US and 70 follow-up SEOs issued within three years of the IPO date	1985 - 2000	Firms domiciled in countries with segmented markets. There is a significant positive and robust relationship between the degree of underpricing and segmented-market firms' seasoned equity offering activities. IPOs from financially segmented markets experience underpricing of 12.2% in U.S., while IPOs from integrated markets experience underpricing of 7.8%. The IPOs from segmented markets have higher underpricing because they are likely to (a) issue seasoned equity; (b) raise a larger proportion of their capital requirements through SEOs; and (c) issue seasoned equity more quickly subsequent to the IPO. IPOs from segmented markets do not leave money on the table for analyst coverage from lead underwriters.

Author	Sample	Period	Key Findings and Conclusions
Gleason et al. (2005)	121 exchange-listed firms on NYSE, NASDAQ, AMEX that conducted reverse merger	1987 - 2001	Reverse mergers may provide shareholders of distressed firms a way to recover some of their investment. While reverse mergers provide alternative means of going public, they are risky and may fail to generate long-term wealth. Little post-event improvement in operations or profitability is observed; 46% of the sample survives longer than two years. The combined fees to the target and the acquirers average 2.72% of the transaction value. Some leading investment banks provide service on reverse takeover deals. The abnormal returns for the public target firms are 25.10%, 15.60%, and 10.84% for the (1,+1), (1, 0), and (0, 0) event windows. Operating performance continues to be negative after reverse merger. Decreasing cash liquidity and increasing debt ratios are found as well. Fewer than 20% reverse merger firms raised capital via public offerings; a little over 31% of the firms did private placements. Almost half of the firms (49%) did neither.
Hasan and Waisman (2010)	83 Israeli IPOs in US, excluding unit offerings, REITs, mutual funds filings, filings of financial institutions	1985 - 2000	Information asymmetry and country risk are among the factors that explain why U.S. investors might discriminate emerging market-based IPO issuers. Common language and an established standing in the US financial community are important factors that may give international issuers a comparative advantage compared to the issuers that lack social ties and previous exposure to U.S. The U.S. bound Israeli IPOs are significantly less underpriced than their local and foreign counterparts; they are significantly larger than their foreign counterparts and tend to perform better than both of other foreign IPOs and US local IPOs in the aftermarket. The U.S. bound Israeli IPOs have products, licensing or franchising relationships or venture capital funds with strong roots in U.S. prior to IPO. The relevant investor community of the U.S. bound Israeli IPOs are small and overwhelmingly American. Only high-quality Israeli IPOs choose to list their securities in the U.S. equity markets, the less promising firms remain in their home markets. Within three aftermarket years, the U.S. bound Israeli IPOs outperformed the US local IPOs by 4.6% per year, other foreign IPOs (ex Canada) outperformed the US local IPOs by 0.88% per year.
Hearn and Filatotchev (2010)	198 locally listed IPOs in Africa	2000 - 2009	There is evidence of a considerable differential in information asymmetry between civil and common law countries. Common law is generally stronger than civil law and has higher investor protection in an emerging business environment characterised by weak institutions and entrenched social elites that have high private benefits of control. Underpricing is significantly and positively related to the relative strength of investor protection laws; this evidence supports the reduced monitoring hypothesis.

Author	Sample	Period	Key Findings and Conclusions
Huang (2011)	1256 IPOs	2000 - 2011	The mean (median) underpricing is 71.08% (43.13%). There is no clear positive or negative relationship between underpricing and underwriter reputation. Based on CRSC's instruction, underwriters usually charge 1.5% to 3% underwriting fee no matter prestigious or ordinary they are. This causes the failure of underwriter reputation mechanism because underwriting fee does not positively relate to underwriter reputation.
Hursti and Maula (2007)	2862 European IPOs, 163 of them are listing on foreign exchanges	1991 - 2001	Foreign venture capitalists, corporate investors, and international experience are positively related to foreign IPOs. Pre-IPO ownership by foreign investors increases the likelihood of listing on a foreign stock exchange. Reputable foreign venture capitalists can add value, but the benefit comes with the risk of driving company control aboard as the exit for investors approaches.
Kadiyala and Subrahmanyam (2002)	139 foreign IPOs and SEOs in the US	1996 - 2000	The mean (median) underpricing is 21.5% (6.02%) for foreign IPOs and 12.3% (2.85%) for foreign SEOs; this finding is consistent with Rock (1986) and Reneveniste and Spindt (1989) in that information asymmetry problem is less severe for foreign firms that already have a trading history. The mean SEO discount is 2.07%; the difference in the SEO discount of emerging market and developed market issuers is not statistically significant. This low SEO discount would suggest a strong incentive for foreign firms to cross-list in U.S. to obtain the concomitant recognition and publicity. As U.S. banks compete aggressively to lead the equity issue, government-owned firms being privatized have lower direct and indirect costs,. Average underwriting fee for foreign IPOs underwritten by U.S. investment banks is 5%, which is lower than the 7% mean reported by Chen and Ritter (2000).
Karim et al. (2010)	129 IPOs on the Bangladeshi stock exchange.	1990 - 2005	CEO-Chair duality and the degree of foreign equity participation are significant determinants of auditor choice, but proportion of board ownership is not. The finding is consistent with agency theory in that foreign shareholders are likely to trade-off higher monitoring costs (of hiring a higher quality auditor) with agency costs arising from information asymmetry. A significant phenomenon present in low and middle income Asian countries is the prevalence of relationship based auditor choice. Clients sometimes prefer a less competent auditor who happens to be their relative or friend to a more competent one who they do not know. In 1980s and 1990s, due to the shortage of supply of securities in Bangladeshi stock market and the absence of a securities market oversight body, about 33 Bangladeshi firms were able to successfully make public equity offerings with insignificant or no nominal operating history. These firms are so-called green field companies. The managers of green field operations play signalling role by hiring higher quality auditors to mitigate the uncertainties associated with their offering.

Author	Sample	Period	Key Findings and Conclusions
King and Segal (2008)	Canadian firms cross listing in the US	1988 - 2005	Foreign firms that cross-list in U.S. experience higher valuation, a lower cost of capital, and increased liquidity. Evidence on the Canadian firms cross listing in U.S. supports the investor recognition hypothesis and bonding hypothesis.
Leon (2007)	global IPOs	1990 - 2005	SOX is promulgated with the intent to bolster the corporate governance of companies listed on domestic exchanges and stands as a bulwark against another Enron.U.S. listed companies are required to submit to an accounting and corporate governance regime that is extremely costly and appears to only yield marginal returns. SOX reduces demand for U.S. equity market participation by foreign companies and threatens the competitiveness of US markets. Following the implementation of SOX, foreign firms seeking to list on a U.S. stock exchange face an elevated barrier to entry.
Li and Hovey (2009)	311 Chinese IPOs	1999 - 2001	Mean underpricing is 132.98%. Firms with higher underpricing have better long-term performance.
Li and Naughton (2007)	314 Chinese IPOs	1999 - 2001	Mean industry-adjusted buy-and-hold return is -3.19% in one aftermarket year, -4.18% in two aftermarket years, and -10.6% in three aftermarket years. Firms with voluntary separation of CEO and Chair positions outperform the firms that don't by 26.3% over a three-year horizon. Adopting dual leadership can be considered as one way of increasing the board's independence from management and reducing uncertainty about intrinsic value of issuing firms.
Liu et al. (2010)	447 Chinese IPOs	2000 - 2004	The industry-adjusted buy-and-hold return is -0.6% in one aftermarket year, -4.2% in two aftermarket years, -16.2% in three aftermarket years, and -8.7% in five aftermarket years. The SOE IPOs outperform the non-SOE IPOs. The industry-adjusted buy-and-hold return for the non-SOEs is -3.3% in one aftermarket year, -52.7% in three aftermarket years, -40.4% in five aftermarket years.
McFarland (2012)			Investors assume the audit is done to North American standards, but the Canadian audit firms tend to rely on local partners licensed to perform auditing work on the companies whose major assets are in the emerging countries. These local partners do not appear to have the training or experience to meet Canadian auditing standards. In addition, the auditors in Asia are usually much more reluctant to challenge their clients. Hence, there is wide gulf in the auditing standards between Canada and emerging countries,

Author	Sample	Period	Key Findings and Conclusions
Pagano et al. (2002)	Nonfinancial European firms that cross list in Europe and the US.	1986 - 1998	European companies that cross-list tend to be large and recently privatized firms, and expand their foreign sales after listing aboard. European companies that cross-list in U.S. pursue a strategy of rapid, equity-funded expansion; the cross-listing in U.S. appears to be driven by the need to fund growth and foreign sales expansion. Cross listing companies are significantly larger than companies that are only listed domestically. After cross listing, the cross listing companies' growth rate is 4% to 6% higher than the control group within three aftermarket years, indicating that new capital needs to be raised. However, return on assets of cross listing companies do not differ significantly from that of the control group. The proportion of sales aboard and the size of the company have the largest impact on the decision to list abroad. Listing aboard is part a means of capitalizing on the reputation acquired through a presence on foreign output markets.
Rock (2002)	two Israeli IPOs in the US and two Taiwan IPOs in home market		There are two different models of IPO exit: the Taiwan model in which IPO exit is on the home stock exchange; and the Israeli model in which IPO exit is on the NASDAQ. A venture capital sector may choose or be stuck with foreign exit options: either IPO on NASDAQ or be acquired by a foreign firm. It matters whether the foreign investors or acquirers view it as domestic or foreign, strange or familiar because many target investors (the large U.S. institutions) may invest in "technology companies" but not in "Israeli companies". The Israeli venture capital fueled companies take full advantage of the U.S. securities regulation option and are viewed by the U.S. investor community as regular, Silicon Valley technology companies. The Taiwan's model makes clear that piggy-backing onto NASDAQ is not necessary; if local valuations are sufficiently "optimistic", other factors (language, geographic proximity, familiarity with the regulatory environment) are likely to push towards an IPO on home markets.
Su and Bangassa (2011)	391 IPOs	2001 - 2006	Underwriter reputation does not affect underpricing, but could mitigate the long-run underperformance. Buy-and-hold abnormal return is -6.01% in one aftermarket year, -14.57% in two aftermarket years, and -18.16% in three aftermarket years. Mean (median) underpricing is 96.9% (82.73%).

Author	Sample	Period	Key Findings and Conclusions
Su and Fleisher (1997)	308 Chinese A-share IPOs and 58 B-share IPOs	1986 - 1996	The mean A-share IPO underpricing before 1996 is 948.59%; the mean B-share IPO underpricing is 37.13%.One of the causes of high IPO underpricing in China has been the relatively small aggregate supply of shares. On average, Chinese firms that offer B shares are considerably larger in terms of total market capitalization; they have higher profit per share, larger total offerings of A shares, and price their A-share IPOs higher than the firms that have not offered B shares. A signaling model relates to subsequent equity offerings (SEO) explains the Chinese A-share IPO underpricing. Issuers with larger IPO underpricing are more likely to raise larger amounts of capital through SEO more quickly. The primary purpose for Chinese firms going public is to raise capital, not to transfer ownership from state to private citizens. The difference in IPO underpricing between A-shares and B-shares can be explained by the difference in domestic and foreign investors' investment opportunities and investment sentiments.
Teshima and Suzuki (2008)	50 firms listing on the SME (Small and Medium Enterprise) board in China	2004 - 2005	In China, both managers and government have incentives to underprice IPO shares. Managers in state-owned firms are appointed by the government and have no significant shareholdings in their firms. They underprice their firms' shares in order not to be penalized for putting the stock market in disarray. The government underprices IPOs shares in order not to upset the IPO investors, because once the IPO investors turn away from the stock market, the subsequent IPOs of state-owned firms are jeopardized. In 2005, the IPO process was changed to a new one in which share prices are determined through book building. The IPO prices after the 2005 reform reflect more investor demand and less government intention. After the 2005 reform, median underpricing is 48.6%.
Tian and Megginson (2007)	1397 Chinese IPOs	1991 - 2004	Both the pricing and supply of IPO shares are subject to a cap set by the government through a quota system. 66% of the IPOs are pure share issue privatizations.
Varadzhakov (2009)	378 Chinese IPOs	2004 - 2008	China heavily relies on foreign capital for private equity investment. But due to the nature of the IPO process in China, IPOs are difficult exit option for private equity investors. Private equities investors exiting on the Chinese A share markets are subject to a compulsory lock-up period of 12 months during which the sale of shares are prohibited; this poses significant liquidity, systemic and valuation risks. Average underpricing is 116%. IPOs market-adjusted return is 14% in one year. Hence, when private equities exit, they are able to generate 14% excess return. Had they been able to exit on the IPO day, the excess return could be 116%.

Author	Sample	Period	Key Findings and Conclusions
Zhang and King (2008)	33 Chinese ADRs, 218 Chinese foreign IPOs, 1418 Chinese domestic IPOs	1993 - 2005	High risk firms and firms with lower financial leverage are more likely to issue ADRs. Large firms are more likely to bear the listing costs and issue ADRs. Significant demands for external capital motivate higher-levered and high growth firms to list abroad. But no evidence supports the hypothesis that the Chinese firms go abroad for expanded shareholder base and listing costs. The motives for Chinese foreign IPOs differ by market. The issuers of Chinese IPOs in Hong Kong are generally similar to the ADR issuers: they are large, low-leverage, profitable, high growth, and high-tech firms. Issuers of Chinese IPOs in Singapore are small, high-leverage, of superior profitability, high growth, and non-high-tech; this is due to the lower listing requirements on size in Singapore stock exchange. Chinese IPOs that choose to issue abroad do not seem to fare well in operating performance. These issuers generally experience lower profitability and a drop in tangible assets ratio and asset turnover. They do not enjoy better sales growth or spend greater amounts in capital expenditure than the industry and peers. The Chinese IPOs in U.S. have negative buy and hold returns, market index adjusted returns, and market model abnormal returns from one to three aftermarket years. The underperformance is from -37% to -61%.