

**DO INVESTORS EARN POSITIVE ABNORMAL
RETURNS FROM INVESTING IN CHINESE FIRMS
LISTED ON THE SINGAPORE EXCHANGE?**

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DECLARATION

I hereby declare that this thesis is my original work and it has been written by me in its entirety. I have duly acknowledged all the sources of information which have been used in the thesis.

This thesis has also not been submitted for any degree in any university previously.

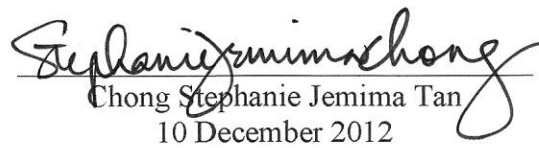

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Summary

This study primarily examines whether investors earn positive abnormal returns from S-chips, firms which are based largely in China but listed on the Singapore Exchange (SGX). The increasing number of Chinese firms seeking listing on SGX and the growing significance of their presence among listed equities make it worthwhile to investigate this research question. As SGX is stepping up its efforts to attract Chinese listings, the results of this study are also relevant to future policy decisions.

The listing of Chinese firms can enable investors to earn positive abnormal returns by giving them access to the phenomenal growth in China and potentially higher returns. However, these Chinese firms have been embroiled in a series of accounting scandals, which have caused their stock prices to decline and investor confidence in the capital markets to be undermined. Whether investors earn positive abnormal returns from Chinese firms thus becomes an issue that needs to be resolved empirically.

Our sample consists of all Chinese firms that listed on SGX during the ten-year period from 2002 to 2011. We define abnormal returns to be the three-year cumulative average abnormal return that investors would have made from investing in our sample portfolio of Chinese firms measured against the return from investing in a portfolio of comparable SGX-listed local firms. We find that the cumulative average abnormal return from investing in Chinese firms is significantly negative, thereby lending support to the conclusion that investors earn negative abnormal returns from investing in Chinese firms. Using both the FTSE Straits Times Index and the FTSE ST All

Share Index as benchmarks for calculating the cumulative average abnormal return yields the same results.

We also test whether our results are being driven by the anomaly of IPO long-term underperformance and by home bias. Chinese firms continued to underperform the most recently listed local comparable firms, which suggests that our results are not due to the anomaly of IPO long-term underperformance. However, there is no significant difference in the returns from investing in Chinese firms and from investing in most recently listed foreign, non-Chinese firms, which suggests that our results are being driven by home bias. We should interpret this result with caution, though, due to the small subsample size of only twenty-eight firms.

We then investigate whether the presence of a reported accounting irregularity at a Chinese firm is significantly related to its long-term underperformance vis-à-vis the above benchmarks. We regress the sample firms' cumulative abnormal returns against indicators of the presence of a reported accounting irregularity. The regression results do not support the finding of a statistically significant relationship. This can be due to the contagion effect of an accounting irregularity or subsequent corporate governance improvements made by the firm after the report of the accounting irregularity surfaced.

To the best of my knowledge, this study is the first to provide empirical evidence on the issue of whether investors earn positive abnormal returns from S-chips.

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1. Introduction

Over the past decade, a significant number of Chinese had firms listed on the Singapore Exchange. From 2002 to 2011, one-third of the firms that listed on SGX are based in China. Having raised over S\$13.8 billion collectively, these firms, also called S-chips, accounted for one-third of the total gross proceeds from initial public offerings (IPOs) in the same period. As of the end of 2011, 144, or 18 percent, of the total number of firms listed on SGX are Chinese, and S-chips accounted for 13 percent of the total market capitalization of SGX.

SGX was also keen to attract more Chinese firms to list here in Singapore. In March 2009, the Singapore Exchange (SGX) head of listings Lawrence Wong was quoted as saying, “Our efforts to attract foreign listings, including China listings, will continue in line with SGX’s Asian Gateway position to provide an international capital platform for Asian-centric companies seeking funding.” (SGX remains keen on attracting China listings, 2009)

The large number of Chinese IPOs and the sheer amount of money invested in them over the past decade make it worthwhile to examine the kind of returns that investors earn from investing in these S-chips. As such, this paper seeks to examine whether investors earn positive abnormal returns from investing in Chinese firms listed on SGX.

The Chinese economy has been growing phenomenally at double-digit rates since 2003. (Tsang, 2010) In 2009, China became the world’s second largest economy in

terms of GDP. Within this rapidly developing economy was a large and increasingly affluent domestic market with plenty of business opportunities. Chinese IPOs are in demand since they are able to provide investors access to these business opportunities and, consequently, higher returns should these opportunities pay off.

However, since 2004, seventeen Chinese firms listed on SGX, or S-chips, have been implicated in accounting scandals that range from lack of timely disclosure of material information to financial fraud. These scandals have sent stock prices of S-chips across the board tumbling and investor confidence in the capital markets waning, thereby destroying value for investors. As such, whether investors earn positive abnormal returns from S-chips has become an issue that needs to be resolved empirically.

Prior studies on the returns from investing in listed Chinese companies have mostly focused within the Chinese financial markets. Studies on the performance of Chinese firms listed outside mainland China are few. The findings of all these prior studies appear to be sensitive to the issued share type, the trading venue, the sample period, and the performance benchmarks. As such, their results may not apply to our research context.

The most similar study to ours is a study by Xu (2001) wherein she examined the performance of H-shares, firms based in mainland China but listed in Hong Kong. However, the period she examined was from 1993 to 2000, the years surrounding the handover of Hong Kong back to China, which was characterized by market volatility

fueled by ever-changing investor sentiments towards China. Her study was conducted in a setting unique to Hong Kong.

Differences in the characteristics of H-shares and S-chips may also render Xu's (2001) results inapplicable in our setting. SGX is generally able to attract smaller Chinese firms to list compared to the ones that list on the Hong Kong Stock Exchange (HKSE). S-chips have an average of S\$377 million in total assets and S\$140 million in revenues in their year of listing, while H-shares have an average of S\$9,880 million in total assets and S\$1,546 million in revenues in their year of listing. The average proceeds raised by a Chinese firm listing in Hong Kong is about S\$523 million, while the average proceeds raised by a Chinese firm listing in Singapore is S\$109 million. SGX is also targeting mainly medium-sized companies in high-growth sectors, and analysts say that these companies are not necessarily the significant ones in the field. (Song, 2002)

There is also the issue as to whether Singapore attracts second-tier Chinese companies who are not qualified to list on the HKSE or are simply not willing to wait in a long lines of companies seeking to list on the HKSE. (Wee, 2004) Chinese companies seem to prefer to list on the HKSE if they can. Within the same sample period from 2002 to 2011, 356 Chinese firms listed in Hong Kong while only 129 Chinese firms listed in Singapore.

To the best of my knowledge, there is no published study on the returns made by investors from Chinese firms listed on SGX.

In examining whether investors earn positive abnormal returns from investing in Chinese firms listed on SGX, we define abnormal return to be the incremental return earned by investors from investing in Chinese IPOs against returns earned from investing in comparable, local firms. Our sample consists of Chinese firms that listed on SGX during the ten-year period from 2002 to 2011. We measure the three-year cumulative average abnormal return of our portfolio of Chinese firms against a portfolio of local control firms matched by industry and market capitalization. To test the robustness of our results, we also measure the cumulative average abnormal return of our portfolio against two indices, the FTSE Straits Times Index and the FTSE ST All Share Index, a portfolio of recently listed control firms in the same industry, and a portfolio of foreign control firms in the same industry. We focus on long-term value or performance of up to three years after going public. Our results show that Chinese firms underperformed all three benchmarks from 2002 to 2011.

We go on to examine whether this underperformance can be attributed to the anomaly of IPO underperformance in the long term or to home bias. Comparing the returns of our sample portfolio against the returns of a portfolio of the most recently listed local firms in the same industry confirms that our results are not being driven by the anomaly of IPO long-term underperformance. The lack of significant differences between the return of our sample portfolio and a portfolio of the most recently listed foreign, non-Chinese firms suggests that our results are due to home bias; however, we should interpret this with caution due to the small subsample size of twenty-eight firms.

We go one step further and try to determine whether the accounting scandals are significantly related to the long-term underperformance of Chinese firms. Prior research has mostly focused on linking accounting irregularities with their short-term effect on the stock prices of the implicated firms. The period examined for each reported violation or restatement ranges from one to twenty days before and after the corporate violation or accounting restatement was made public. I am not aware of any published study on the effect of corporate violations or accounting restatements on the long-term stock price performance of the firm.

We perform an ordinary least squares regression analysis with the three-year cumulative abnormal return of the Chinese firm as the dependent variable and a dummy variable indicating whether the firm had been reported in the press to have been involved in an accounting irregularity as one of the independent variables. The results do not support a statistically significant relationship, although this may be because of the contagion effect of the accounting scandals or subsequent improvements in the corporate governance of the implicated firms.

The rest of the paper is arranged as follows. Section 2 outlines our motivation for this study. Section 3 presents the reasons why investors can earn positive or negative abnormal returns from Chinese firms listed on SGX. Section 4 provides a literature review on the long-term stock price performance of listed Chinese firms. Section 5 discusses our sample and methodology. Section 6 shows the details of our results. Section 7 explores the possibility of accounting scandals being significantly related to the underperformance of Chinese firms. Section 8 concludes the paper.

2. Motivation: the increasing significance of Chinese firms on SGX

The increasing significance of Chinese firms on SGX makes it worthwhile to study whether their investors earn positive abnormal returns from investing in them. Between 2002 and 2011, one-third of the firms that listed on the Singapore Exchange are based or conduct a majority of their business in China. In the same period, these firms raised over S\$13.8 billion, which is equivalent to one-third of the total gross proceeds from initial public offerings (IPOs). The annual number of Chinese firms listing on SGX increased steadily from 2002 and peaked in 2007, when Chinese firms comprised 25 out of the 52 new listings. Excluding the large IPO made by Hutchison Port Holdings Trust in 2011, the amount of annual gross proceeds raised by Chinese firms peaked in 2007 at S\$2.6 billion, while the percentage of annual gross proceeds raised by Chinese firms peaked in 2008 at half of the total proceeds raised in IPOs that year. Table 1 below shows the total number and aggregate gross proceeds of all IPOs on SGX each year from 2002 to 2011 and the corresponding figures for the subset of Chinese IPOs.

Because of this whirlwind of listing activity, Chinese stocks now make up a significant percentage of the stocks listed on SGX. As of December 31, 2011, 144, or 18 percent, of the 775 listed firms are Chinese, and their total market capitalization stood at S\$85.7 billion, which corresponds to 13 percent of the total market capitalization of SGX of S\$651 billion.

Table 1: Distribution of Initial Public Offerings in SGX by Year from 2002 to 2011

These figures are calculated using data from Bloomberg. No price level adjustments have been made.

Year:	All IPOs in SGX		Chinese IPOs in SGX			
	Number of IPOs:	Aggregate gross proceeds (In thousands of SGD):	Number of IPOs:	Percentage of Chinese IPOs vs all IPOs:	Aggregate gross proceeds (In thousands of SGD):	Percentage of Chinese IPO proceeds vs all proceeds:
2002	27	1,417,914	3	11.11%	18,510	1.31%
2003	46	2,408,833	11	23.91%	368,825	15.31%
2004	67	2,920,965	26	38.81%	899,874	30.81%
2005	46	2,938,652	13	28.26%	457,557	15.57%
2006	49	5,911,015	23	46.94%	1,680,743	28.43%
2007	52	6,867,622	25	48.08%	2,629,784	38.29%
2008	26	1,498,378	11	42.31%	752,245	50.20%
2009	23	2,827,160	6	26.09%	207,096	7.33%
2010	31	7,504,670	8	25.81%	619,977	8.26%
2011	21	7,698,534	3	14.29%	6,218,666	80.78%
Total	388	41,993,745	129	33.25%	13,853,279	32.99%

Despite the increasing percentage of Chinese firms listed on SGX, the debate remains as to whether investors can earn positive abnormal returns from investing in them. On one hand, investing in Chinese firms allows investors to gain exposure to the large profit potential present in the rapidly developing economy of China. On the other hand, Chinese firms have been embroiled in a series of corporate scandals that threaten to undermine investor confidence in the market.

The debate on whether investors can earn positive abnormal returns from Chinese firms also has important implications for SGX's growth strategy and policy decisions. SGX is keen to have Chinese firms list as part of its growth strategy. As Singapore has a very limited number of homegrown companies with the potential for listing, SGX needs to attract foreign companies to list on its two boards and become a regional stock exchange, an "Asian Gateway to provide an international capital platform for Asian-centric companies seeking funding", as part of its growth strategy.

(SGX remains keen on attracting China listings, 2009; The dangers of Singapore's grasp at overseas listings, 2011) Chinese companies have become arguably the largest IPO clients in the world. (Tsang, 2010) SGX has also been struggling to attract IPOs from countries other than China and therefore has become more reliant on Chinese firms for growth. (Khoo, SGX remains keen on Chinese firms, 2009)

This study seeks to partially resolve that debate by providing empirical evidence on the performance of SGX-listed Chinese firms. In this study, we examine the excess returns that investors earn from investing in these Chinese firms vis-à-vis that from investing in comparable local firms that are also listed on SGX.

3. Chinese firms: positive or negative abnormal returns for investors vis-à-vis local firms?

Investors can potentially make positive or negative abnormal returns from investing in Chinese firms.

3.1. Why investors can earn positive abnormal returns from Chinese firms vis-à-vis local firms

Investors can earn positive abnormal returns from investing in Chinese firms since Chinese firms offer them exposure to the phenomenal growth in China. China has been enjoying double-digit annual growth in GDP since 2003 and has overtaken Japan in 2009 to become the world's second largest economy in terms of GDP. There is no doubt that China is one of the most important developing markets. (Tsang, 2010) China has been dubbed the engine of growth for Asia, if not the world. A result of this rapid economic growth is a large and growing domestic market for goods and services that presented plenty of growth opportunities for firms based in China. These firms faced profit growth potential generally larger than what could be expected from other developed economies that were experiencing less than 5% GDP growth each year.

Investors in some high-profile Chinese listings had also been handsomely rewarded in the past. There are investors who want to purchase Chinese stocks because they believe that the stock price would appreciate in the future despite not being convinced

of the current valuations. They believe that the demand for the stock, which can be oversubscribed by 30 or 40 times, will simply drive the prices up. (Norton, 2004)

3.2. Why investors can earn negative abnormal returns from Chinese firms vis-à-vis local firms

Investors can potentially earn significant negative abnormal returns from Chinese firms since many of these firms had been reported to have accounting irregularities, thereby undermining investor confidence in them and resulting in lower stock prices and negative returns. From 2002 to 2011, there had been reported irregularities in seventeen Chinese firms, and the number of incidences had been increasing in the more recent years.

Corporate scandals have plagued listed Chinese firms since the early 2000s. These scandals mostly centered on alleged tax evasions, accounting fraud, and misuse of funds. Despite involving in large part only Chinese firms listed on the mainland and the Hong Kong stock exchanges then, Chinese firms everywhere, including those listed on SGX, suffered from negative investor sentiments. (Song, 2002)

The first case of an SGX-listed Chinese firm being implicated of accounting irregularities was in October 2004. An audit panel found accounting irregularities related to sales, cost of goods sold, and receivables within the books of New Lakeside Holdings, a manufacturer of apple juice concentrate based in China that had been listed then for only a few months. (Singapore-listed New Lakeside audit panel uncovers financial irregularities, 2004) In the following month, Sinomem

Technology's executive director, also the spouse of its founder, sold off her five percent stake in the company without properly disclosing the sale. (Koh J. , 2004) In the same month, China Aviation Oil shocked the market when it finally disclosed that it racked up losses of US\$550 million in speculative oil derivatives trading; the company had been involved in speculative derivatives trading since 2003 but failed to disclose its losses promptly. (Singapore's China Aviation: US550M in derivatives losses, 2004)

In 2006, another two Chinese companies were reported to have accounting irregularities. Bio-Treat Technology Ltd reported an "accounting error" which rendered "material differences in the revenue and cost of sales items" and therefore restated its previously released financial statements. (Singapore-listed Bio-Treat restates 2006 revenue due to accounting error, 2006) China Food Industries announced additional provisions for doubtful receivables following a special audit wherein its auditor found falsified accounts at two of its subsidiaries. (Singapore-listed China Food lower on additional provisions, 2006)

In 2009, five Chinese firms were reported to have financial irregularities. Fibrechem Technologies delayed the announcement of its annual financial results when its auditor discovered irregularities during its audit of the company's trade receivables and cash balances. (FibreChem investigates questionable transactions, 2009) The chairman of Beauty China Holdings disclosed belatedly that he had mortgaged his shares in the firm and had been forced to sell them. (Chow, 2009) Oriental Century's chairman and CEO admitted to inflating sales and cash balances at the firm while diverting the firm's assets to an interested party. (Khoo & Oh, Accounting scandal

rocks another S-chip, 2009) The auditor for China Sun Bio-chem Technology said that it could not confirm the company's bank balances and accounts receivables and therefore it was unable to complete its annual audit. (S-chip firms in big trouble, 2009) China Hongxing Sports disclosed a material change in its shareholdings five months late. (Goh, 2009)

The number of accounting scandals involving Chinese firms was highest in 2011 with seven incidents reported in the press. KXD Digital Entertainment faced disciplinary action from SGX for failing to disclose the legal suits that it was facing, to seek shareholder approval for interested party transactions, and to announce that it had ceased business operations and had effectively become a cash company. (Past Disciplinary Actions, 2011) The auditor of Hongwei Technologies could not confirm the cash and bank balances of its subsidiary in China. (Khoo, Audit woes bedevil China Hongxing, Hongwei, 2011) China Gaoxian Fibre Fabric Holdings' auditor could not confirm the bank balances for two of its subsidiaries. (Still Opportunities in Quality S-chips, 2011) Improper accounting procedures spanning the period from 2001 to 2009 were found at Cosco Corporation's parent company. (Warden, 2011) Sino Techfibre's auditor discovered discrepancies in the firm's and its suppliers' invoices. (Auditors of Sino Techfibre discover discrepancies, 2011) The special auditors of China Milk Products Group found that payments were being made in the company with neither board approval nor documentation. (S-Chips feeling the heat of accounting woes, 2011) China Sky Fibre Chemical failed to properly disclose interested party transactions and material information on the acquisition and development of land and significant repairs and maintenance costs. (Past Disciplinary Actions, 2011)

These corporate scandals dealt blow after blow to the stock prices and credibility of not only the implicated firms but also all other listed Chinese firms. Chinese firms became characterized as having weak corporate governance and lacking in transparency. Investors were left wondering whether reported financials at these Chinese companies were real and whether management was credible. (Yang, 2009) According to UOB Kay Hian director Chan Tuck Sing, “If you buy a Chinese company, there is always a question mark. The issue of governance and accounting transparency is always there.” (Koh G. , 2006) These accounting scandals have resulted in investor confidence in the capital markets being undermined.

Investors with stakes in Chinese companies whose stock prices fell drastically or those that delisted or suspended the trading of their shares due to these accounting scandals had also rarely been able to recoup their investments. There is very little anyone can do to pursue these companies’ assets, as they are all located overseas. (The dangers of Singapore's grasp at overseas listings, 2011) Analysts have also been concerned that the returns on Singapore companies may be dragged down due to their exposure to Chinese companies. (Khoo & Oh, Accounting scandal rocks another S-chip, 2009)

SGX responded to these corporate scandals by enforcing stricter regulations. In 2004, amidst a flood of IPOs by Chinese firms, SGX introduced tougher disclosure rules and greater scrutiny of investment bankers, IPO sponsors, and IPO applicants. (Siow, 2004) In 2005, SGX implemented new rules to strengthen corporate governance. These include the following: (1) requiring foreign companies to appoint to their board

a third independent director who is either a Singapore resident or an expert on Singapore law; (2) requiring boards to give negative assurances for quarterly results that say they are not aware of any circumstances that may render the results false or misleading; (3) requiring boards and CEOs to confirm each year that their companies have effective risk management systems in place; and (4) increasing the time period that an investment bank's name is stated on a newly listed company's statements to two years. (Prystay, 2005) SGX again proposed new plans to tighten governance in 2009, which include appointing chief financial officers and independent directors at least six months before a company submits its documents to the exchange for listing purposes and requiring controlling shareholders of listed companies to have their shares reside with the Central Depository in Singapore. (Chen G. , 2009) Finally, in 2011, SGX started requiring its listed companies to disclose more information about their internal controls and legal representatives. (Singapore Exchange to toughen corporate governance rules, 2011) Despite the continuous tightening of rules and regulations, the number of reported accounting irregularities did not abate; instead, the costs of going public for all firms increased, potentially discouraging other good companies from listing and depriving investors of possibly good investment opportunities.

It is unclear which argument is stronger, that for investors earning positive or negative abnormal returns from Chinese firms. Empirical evidence is necessary for determining which effect dominates.

4. The long-term performance of Chinese initial public offerings

This section reviews the literature on the long-term stock price performance of Chinese firms listed on stock exchanges both in and outside China.

Mok and Hui (1998) conducted a study on the aftermarket performance of A-share¹ and B-share IPOs issued between June 1992 and December 1993 in the Shanghai Stock Exchange. They found that over a 350-day period after listing, underpriced A-shares approximated the market return, while overpriced A-shares and B-shares had positive cumulative average excess returns when benchmarked against the appropriate Shanghai stock indices.

Chen *et al.* (2000) conducted a study similar to Mok and Hui (1998). They used a sample consisting of IPOs from both the Shanghai and Shenzhen stock exchanges issued within the four calendar years from 1992 to 1995 and a longer aftermarket time window of up to three years. Their results show that while market-adjusted returns from a buy-and-hold strategy are positive after the first year, they became significantly negative at the end of the third year for both A-shares and B-shares.

Chan *et al.* (2004) also examined the long-term performance of IPOs in China. They used a bigger sample of A-shares issued between January 1993 and December 1998 and B-shares issued between January 1995 and December 1998. Instead of using the broad stock exchange indices as benchmarks in calculating market-adjusted returns,

¹ There are two types of stocks issued and traded in China's stock exchanges. "A" shares are issued exclusively to domestic investors and are traded in the local currency, while "B" shares are issued exclusively to foreign investors primarily by private placement and traded in foreign currencies.

they used three portfolios made up of control firms matched by size, by book-to-market ratio, and by both size and book-to-market ratio respectively to the IPOs in their sample. Their results show that A-shares underperformed all three benchmark portfolios throughout the entire three-year aftermarket period. On the other hand, B-shares outperformed all three benchmark portfolios every month for three years after listing.

Chi and Padgett (2005) found that A-shares outperformed both the Shanghai A-share Index and the Shenzhen A-share Index, with cumulative market-adjusted returns of approximately 10% at the end of three years after listing. Their sample consists of 409 firms that listed A-shares on either the Shanghai Stock Exchange or the Shenzhen Stock Exchange between January 1, 1996 and December 31, 1997.

Contrary to Chi and Padgett's (2005) results, Cai *et al.* (2008) found that at the end of the three-year aftermarket period, the 335 A-shares listed on the Shanghai Stock Exchange from 1997 to 2001 underperformed the Shanghai A-share Index by 25% in terms of cumulative abnormal returns and 29% in terms of buy-and-hold abnormal returns.

Chi *et al.* (2010) studied the long-run stock performance of 897 A-share IPOs that listed on the Shanghai Stock Exchange and the Shenzhen Stock Exchange between 1996 and 2002. They used the Shanghai A-share Index and the Shenzhen A-share Index as benchmarks. Their results show that both cumulative abnormal returns and buy-and-hold abnormal returns are significantly positive for IPOs from 1996 to 1999 but began to decline and became significantly negative for IPOs listed thereafter.

Chang *et al.* (2010) used a larger sample of 1,194 A-share IPOs from a longer sample period of 1993 to 2004. Similar to Chan *et al.* (2004), they matched the sample firms with control firms based on size, book-to-market ratio, and both size and book-to-market ratio to calculate buy-and-hold adjusted returns. Consistent with Chan *et al.* (2004), their results show that over a three-year period, A-share IPOs underperformed all three benchmarks.

Shiah-Hou (2005) focused on the performance of B-shares issued from 1992 to 1999. She found that for a period of 280 trading days after listing, B-shares slightly outperformed the portfolio of all firms from the same industry as the sample firm. If the aftermarket period is extended to 560 trading days, B-shares underperformed their industry portfolios by a small percentage.

Xu (2001) examined the characteristics and performance of H-shares, companies that were incorporated in mainland China but listed in Hong Kong. She found that the performance of H-shares had been very volatile during the period of 1993 to 2000, with the dramatic ups and downs fueled by ever-changing investor sentiments towards China. Foreign investors had also been deterred from investing in H-shares due to their “lack of financial transparency, poor management, and improper usage of funds in noncore businesses”.

Schaub (2010) did a short study on the performance of Chinese American Depository Receipts (ADRs) listed on the New York Stock Exchange (NYSE) for the three-year period after listing. He found that on average, the returns on Chinese ADRs were

similar to the returns of the S&P 500 Index; however, those that traded during the bull market underperformed the market index by over 26%, while those that traded during the bear market outperformed the market index by almost 40%.

The findings of these studies on the long-term performance of Chinese IPOs appear to be sensitive to the type of shares issued, the venue on which the shares are listed and traded, the sample period of the study, and the benchmarks used. As such, we cannot extrapolate any of these results to determine whether the listing of Chinese firms on SGX adds value to investors.

5. Data and methodology

5.1. Sample

Our sample consists of all Chinese companies with data available on Bloomberg that listed on the Singapore Exchange during the ten-year period from January 1, 2002 to December 31, 2011. A firm is classified as Chinese if it meets any of the following criteria: (1) Bloomberg lists the firm's country of domicile as China; (2) Bloomberg lists the firm's ultimate parent country of risk as China; or (3) the firm is a member of the FTSE ST China Index, a broad China-play index. Our sample has 127 firms and includes 88% of the 144 Chinese firms listed on SGX as of the end of 2011. Our sample is broad-based. There is at least one firm in each GICS sector. The sample firms' market capitalizations range from about S\$2 million to S\$10 billion at the end of their first trading day.

5.2. Methodology

In determining whether Chinese IPOs add value to investors, we define value to be the incremental return that investors can earn from investing in Chinese firms compared to the returns that they can make from investing in comparable local firms within the same period. We focus on value over the long run, specifically a period of three years from the listing date of the Chinese firm.

We adopt Ritter's (1991) methodology in comparing the long-term performance of IPOs versus other firms and use the following two measures: cumulative average

adjusted return and wealth relative. In constructing these measures, we set the following as benchmarks for the performance of Chinese firms: (1) a portfolio of control firms matched against the sample firms based on industry and size; (2) the FTSE Straits Times Index, which contains the top thirty companies by market capitalization that is listed on the Singapore Exchange; and (3) the FTSE ST All Share Index, which contains the top 98% of all companies listed on the Mainboard. Ritter (1991) noted that the quantitative measurement of the long-run performance of initial public offerings is sensitive to the benchmark used. We use different benchmarks to test whether our results remain consistent and thus be able to establish a stronger conclusion.

Control firms are selected in the following manner. For each sample firm, a list of local firms belonging to the same Global Industry Classification Standard (GICS) industry group or having the same four-digit GICS code is generated. The market capitalization for each local firm on December 31 of the year prior to the sample firm's year of listing is then calculated. The local firm with the market capitalization that is closest to that of the sample firm at the end of the sample firm's first day of trading is then selected as the control firm. Each firm may be designated as the control firm for only one sample firm. If there are no more firms belonging to the same GICS industry group from which we can choose, then a control firm is chosen from the list of local firms belonging to the same GICS sector or having the same two-digit GICS code as the sample firm.

Cumulative average adjusted returns measure the average incremental return from investing in Chinese firms cumulated through time. In constructing this measure,

returns, including those from dividends, are first calculated monthly for the sample firm and the control firm or the benchmark index commencing from the end of the first day of trading of the sample firm until three years later or December 31, 2011, whichever is earlier. For sample firms that delisted before the three-year listing anniversary or before December 31, 2011, returns are calculated until the last trading day. Each month consists of twenty-one trading days. The sample firm's adjusted returns are then computed by subtracting the control firm's or the benchmark index's return from the sample firm's return. The average adjusted return for any month t is the arithmetic average of the adjusted returns for all sample firms. The cumulative average adjusted return for month t is the sum of all the average adjusted returns from month 1 to month t . Statistically significant positive cumulative average adjusted returns imply that investors can earn positive abnormal returns from investing in Chinese firms, while statistically significant negative cumulative average adjusted returns imply that investors earn negative abnormal returns from investing in Chinese firms.

The wealth relative is the ratio of the wealth accumulated from a buy-and-hold strategy using our portfolio of sample Chinese firms to the wealth accumulated from a buy-and-hold strategy using the portfolio of control firms.

Holding period returns are first calculated individually for the sample firms and their corresponding control firms for the period commencing from the end of the first day of trading until three years later. Should the three-year listing anniversary of the sample firm fall beyond December 31, 2011, holding period returns are calculated only until December 31, 2011. For sample firms that delisted before their three-year

listing anniversary or before December 31, 2011, returns are calculated until the last trading date.

The wealth relative is then calculated using the following formula:

$$\textit{Wealth relative} = \frac{1 + \textit{average holding period return of all sample firms}}{1 + \textit{average holding period return of all control firms}}$$

A wealth relative of more than 1 implies that Chinese firms outperformed the control group in terms of buy-and-hold returns and therefore investors earned positive abnormal returns from investing in them, while a wealth relative of less than 1 implies that Chinese firms underperformed the control group and therefore investors earned negative abnormal returns from investing in them.

All of the data used in this study were taken from Bloomberg unless stated otherwise.

6. The underperformance of Chinese firms

6.1. Results based on cumulative average adjusted returns

Table 2 below shows the monthly average adjusted returns and the cumulative average adjusted returns for our portfolio of Chinese firms benchmarked against a portfolio of local control firms matched by industry and market capitalization. Most of the *t*-statistics for the monthly average adjusted returns are insignificant; however, they are negative for twenty-five of the thirty-six months, which suggests that Chinese firms underperformed their control firms for more than two-thirds of the time. Cumulative average adjusted returns are significantly negative from the twelfth month onwards until three years later. Over a period of three years, investors who invested in Chinese firms listed on SGX earned significantly less compared to those who invested comparable local firms.

Table 2: Monthly and Cumulative Average Adjusted Returns for Chinese Firms Measured Versus Local Control Firms Matched by Size and Industry

Average adjusted return (AAR) for any month t is calculated as follows: $AAR_t = [\sum_{i=1}^{n_t} (r_{ipo,it} - r_{control,it})] / n_t$, where $r_{ipo,it}$ is the total return on the Chinese firm i in event month t , and $r_{control,it}$ is the total return on the corresponding control firm. The t -statistic for the average adjusted return is computed for each month as: $AAR_t \times \sqrt{n_t} / sd_t$, where AAR_t is the average adjusted return for month t , n_t is the number of observations in month t , and sd_t is the cross-sectional standard deviation of the adjusted returns for month t . The t -statistic for the cumulative average adjusted return in month t , $CAR_{1,t}$, is computed as $CAR_{1,t} \times \sqrt{n_t} / csd_t$, where n_t is the number of observations in month t , and csd_t is computed as $csd_t = [t \times var + 2 \times (t-1) \times cov]^{1/2}$, where t is the event month, var is the average (over 60 months) cross-sectional variance, and cov is the first-order autocovariance of the AAR_t series.

Month of Seasoning:	Number of Firms:	Average Adjusted Return:	t -stat:	Cumulative Average Adjusted Return:	t -stat:
1	127	-5.88%	-2.96	-5.88%	-2.93
2	127	7.39%	3.86	1.50%	0.53
3	127	-0.63%	-0.36	0.88%	0.25
4	127	-2.01%	-1.24	-1.13%	-0.28
5	127	-3.32%	-1.88	-4.45%	-0.99
6	127	0.89%	0.54	-3.56%	-0.73
7	126	-1.64%	-0.87	-5.20%	-0.98
8	126	-0.79%	-0.47	-5.99%	-1.05
9	126	1.02%	0.61	-4.97%	-0.83
10	125	-4.79%	-2.53	-9.77%	-1.53
11	125	-2.32%	-1.57	-12.09%	-1.81
12	124	-3.73%	-1.93	-15.82%	-2.26
13	123	-1.79%	-0.79	-17.61%	-2.40
14	123	-0.84%	-0.37	-18.45%	-2.43
15	121	-1.06%	-0.58	-19.50%	-2.46
16	120	-1.61%	-0.83	-21.11%	-2.56
17	120	-0.97%	-0.55	-22.08%	-2.60
18	120	-1.26%	-0.39	-23.34%	-2.67
19	119	0.70%	0.39	-22.64%	-2.51
20	119	0.25%	0.17	-22.39%	-2.42
21	119	-4.25%	-1.92	-26.64%	-2.81
22	117	-2.44%	-1.33	-29.09%	-2.98
23	116	1.15%	0.56	-27.94%	-2.78
24	114	-3.02%	-0.89	-30.96%	-2.99
25	114	-1.93%	-1.08	-32.89%	-3.12
26	114	4.21%	2.14	-28.68%	-2.66
27	113	-3.15%	-0.85	-31.84%	-2.89
28	110	0.59%	0.32	-31.25%	-2.75
29	108	2.49%	1.60	-28.76%	-2.46
30	108	-1.26%	-0.75	-30.02%	-2.53
31	108	3.30%	2.01	-26.72%	-2.21
32	108	-5.20%	-1.86	-31.92%	-2.60
33	108	-3.44%	-1.59	-35.37%	-2.84
34	108	-0.76%	-0.39	-36.12%	-2.86
35	108	0.17%	0.09	-35.95%	-2.80
36	108	-3.93%	-1.58	-39.88%	-3.06

Table 3 below shows the three-year monthly average adjusted returns and the cumulative average adjusted returns for our portfolio of Chinese firms as benchmarked against the FTSE Straits Times Index. Although the t -statistics for the monthly average adjusted returns are mostly insignificant, they are negative for twenty-six of the thirty-six months in our sample period. This suggests that having invested in Chinese firms would have been less profitable compared to having invested in the FTSE Straits Times Index at any given month for more than two-thirds of the time. Cumulative average adjusted returns are significantly negative from the seventh month onwards until the thirty-sixth month, and they show that Chinese firms started significantly underperforming the FTSE Straits Times Index from the seventh month after listing until three years later. These results are largely consistent with the previous table wherein the portfolio of local control firms was used as the benchmark and support the conclusion that the investors who invested in Chinese firms listed on the SGX earned less than those who invested in comparable local firms.

Table 3: Monthly and Cumulative Average Adjusted Returns for Chinese Firms Measured Versus the FTSE Straits Times Index

Average adjusted return (AAR) for any month t is calculated as follows: $AAR_t = [\sum_{i=1}^{n_t} (r_{ipo,it} - r_{control,it})] / n_t$, where $r_{ipo,it}$ is the total return on the Chinese firm i in event month t , and $r_{control,it}$ is the total return on the benchmark index. The t -statistic for the average adjusted return is computed for each month as: $AAR_t \times \sqrt{n_t} / sd_t$, where AAR_t is the average adjusted return for month t , n_t is the number of observations in month t , and sd_t is the cross-sectional standard deviation of the adjusted returns for month t . The t -statistic for the cumulative average adjusted return in month t , $CAR_{1,t}$, is computed as $CAR_{1,t} \times \sqrt{n_t} / csd_t$, where n_t is the number of observations in month t , and csd_t is computed as $csd_t = [t \times var + 2 \times (t-1) \times cov]^{1/2}$, where t is the event month, var is the average (over 60 months) cross-sectional variance, and cov is the first-order autocovariance of the AAR_t series.

Month of Seasoning:	Number of Firms:	Average Adjusted Return:	t -stat:	Cumulative Average Adjusted Return:	t -stat:
1	127	-7.91%	-4.29	-7.91%	-5.07
2	127	5.95%	3.61	-1.95%	-0.89
3	127	-1.28%	-0.80	-3.23%	-1.20
4	127	-3.26%	-2.39	-6.49%	-2.08
5	127	-1.73%	-1.47	-8.22%	-2.36
6	127	1.76%	1.28	-6.46%	-1.69
7	126	-2.20%	-1.49	-8.66%	-2.09
8	126	-1.45%	-1.10	-10.11%	-2.29
9	126	-0.37%	-0.28	-10.48%	-2.23
10	125	-4.18%	-3.65	-14.66%	-2.95
11	125	-1.26%	-0.97	-15.92%	-3.06
12	124	-3.45%	-3.00	-19.37%	-3.55
13	124	-1.03%	-0.64	-20.41%	-3.59
14	124	0.44%	0.27	-19.97%	-3.39
15	122	0.59%	0.41	-19.37%	-3.15
16	121	-0.25%	-0.18	-19.62%	-3.08
17	121	-2.13%	-1.59	-21.75%	-3.31
18	121	1.87%	1.26	-19.88%	-2.94
19	120	-0.40%	-0.28	-20.28%	-2.90
20	120	-0.08%	-0.06	-20.37%	-2.84
21	120	-1.70%	-1.15	-22.07%	-3.01
22	118	-2.13%	-1.53	-24.20%	-3.19
23	117	0.18%	0.11	-24.02%	-3.09
24	116	-0.37%	-0.21	-24.39%	-3.05
25	116	-1.94%	-1.39	-26.33%	-3.23
26	116	3.13%	1.74	-23.20%	-2.79
27	115	2.05%	1.36	-21.15%	-2.49
28	112	-0.63%	-0.43	-21.78%	-2.48
29	110	0.74%	0.51	-21.03%	-2.33
30	110	-1.27%	-1.03	-22.30%	-2.43
31	110	2.72%	1.79	-19.58%	-2.10
32	110	-1.23%	-0.71	-20.80%	-2.20
33	110	-0.39%	-0.29	-21.19%	-2.20
34	110	-2.43%	-1.83	-23.63%	-2.42
35	110	-0.06%	-0.04	-23.69%	-2.39
36	110	-2.44%	-1.51	-26.13%	-2.60

Table 4 below shows the three-year monthly average adjusted returns and the cumulative average adjusted returns for our portfolio of Chinese firms as benchmarked against the FTSE ST All Share Index. Monthly average adjusted returns are negative for twenty-four out of the thirty-six months in our sample period, although the *t*-statistics are not significant for most months. These imply that more than half the time for any given month, investors were better off having invested in the broad FTSE ST All Share Index than in our portfolio of sample Chinese firms. Cumulative average adjusted returns are significantly negative from the seventh month until the thirty-sixth month, which shows that the returns from buying and holding our portfolio of Chinese firms are lower than the returns from investing in the broad-based FTSE ST All Share Index from the seventh month after the Chinese firms' listing until three years later. These results are again consistent with those from the previous two tables in supporting the conclusion that the investors who invest in Chinese firms listed on SGX made less returns than those who invested in comparable local firms.

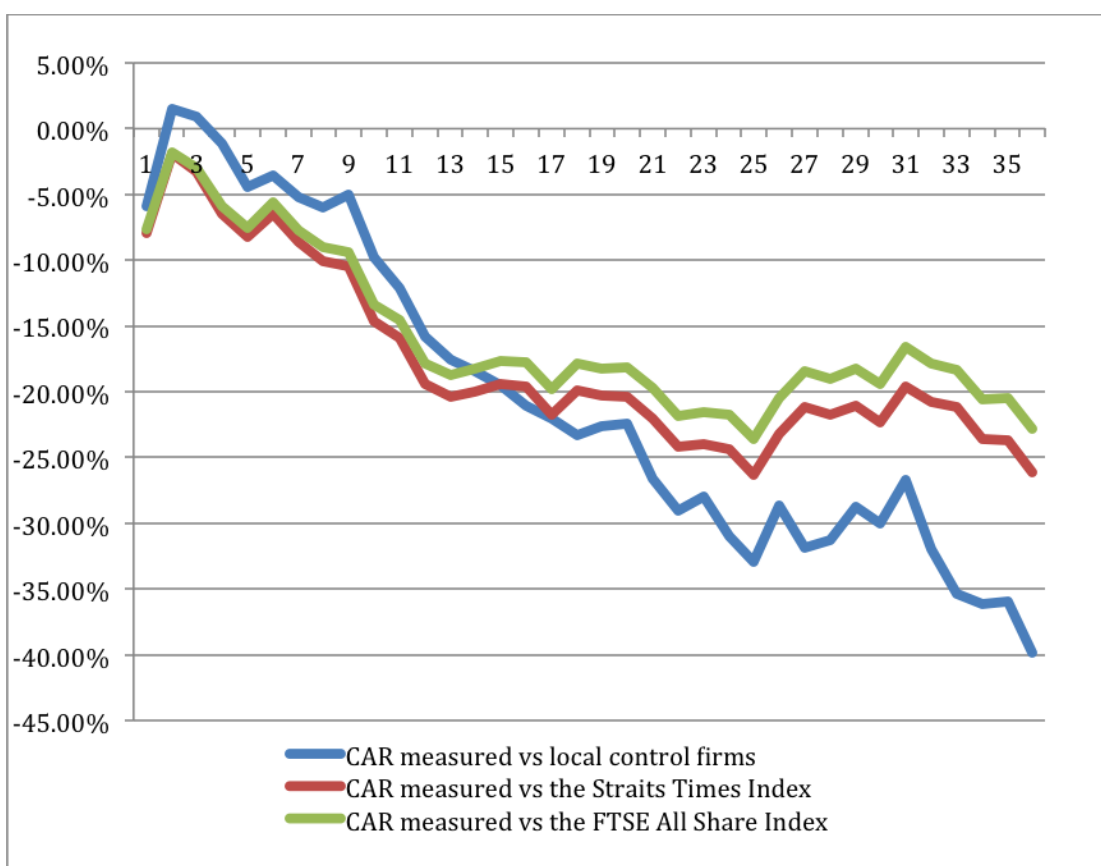
Table 4: Monthly and Cumulative Average Adjusted Returns for Chinese Firms Measured Versus the FTSE ST All Share Index

Average adjusted return (AAR) for any month t is calculated as follows: $AAR_t = [\sum_{i=1}^{n_t} (r_{ipo,it} - r_{control,it})] / n_t$, where $r_{ipo,it}$ is the total return on the Chinese firm i in event month t , and $r_{control,it}$ is the total return on the benchmark index. The t -statistic for the average adjusted return is computed for each month as: $AAR_t \times \sqrt{n_t} / sd_t$, where AAR_t is the average adjusted return for month t , n_t is the number of observations in month t , and sd_t is the cross-sectional standard deviation of the adjusted returns for month t . The t -statistic for the cumulative average adjusted return in month t , $CAR_{1,t}$, is computed as $CAR_{1,t} \times \sqrt{n_t} / csd_t$, where n_t is the number of observations in month t , and csd_t is computed as $csd_t = [t \times var + 2 \times (t-1) \times cov]^{1/2}$, where t is the event month, var is the average (over 60 months) cross-sectional variance, and cov is the first-order autocovariance of the AAR_t series.

Month of Seasoning:	Number of Firms:	Average Adjusted Return:	t -stat:	Cumulative Average Adjusted Return:	t -stat:
1	127	-7.62%	-4.20	-7.62%	-5.36
2	127	5.84%	3.60	-1.78%	-0.88
3	127	-1.17%	-0.75	-2.95%	-1.20
4	127	-2.97%	-2.21	-5.92%	-2.08
5	127	-1.62%	-1.39	-7.54%	-2.37
6	127	1.89%	1.41	-5.65%	-1.62
7	126	-2.10%	-1.45	-7.74%	-2.05
8	126	-1.27%	-0.97	-9.01%	-2.23
9	126	-0.36%	-0.27	-9.37%	-2.19
10	125	-4.02%	-3.55	-13.39%	-2.96
11	125	-1.19%	-0.94	-14.58%	-3.07
12	124	-3.28%	-2.91	-17.86%	-3.59
13	124	-0.87%	-0.55	-18.73%	-3.61
14	124	0.48%	0.30	-18.25%	-3.39
15	122	0.60%	0.42	-17.66%	-3.15
16	122	-0.09%	-0.06	-17.75%	-3.06
17	121	-2.08%	-1.58	-19.82%	-3.30
18	121	2.00%	1.38	-17.82%	-2.89
19	120	-0.37%	-0.26	-18.20%	-2.86
20	120	0.04%	0.03	-18.15%	-2.78
21	120	-1.57%	-1.08	-19.72%	-2.94
22	118	-2.10%	-1.53	-21.81%	-3.16
23	117	0.29%	0.17	-21.52%	-3.03
24	116	-0.23%	-0.13	-21.76%	-2.99
25	116	-1.87%	-1.34	-23.62%	-3.18
26	116	3.17%	1.79	-20.46%	-2.70
27	115	2.05%	1.37	-18.41%	-2.37
28	112	-0.58%	-0.40	-18.99%	-2.37
29	110	0.74%	0.51	-18.25%	-2.22
30	110	-1.16%	-0.96	-19.41%	-2.32
31	110	2.79%	1.87	-16.62%	-1.96
32	110	-1.23%	-0.72	-17.85%	-2.07
33	110	-0.46%	-0.35	-18.30%	-2.09
34	110	-2.30%	-1.76	-20.60%	-2.31
35	110	0.15%	0.09	-20.45%	-2.26
36	110	-2.34%	-1.46	-22.79%	-2.49

The results of the previous three tables all similarly show that Chinese firms have lower cumulative average adjusted returns when benchmarked against a portfolio of local control firms, the FTSE Straits Times Index, and the FTSE ST All Share Index. It is then strongly implied and supported that investors earn negative abnormal returns from investing in Chinese firms listed on SGX compared to investing in local comparable firms. Figure 1 presents a graph of cumulative average adjusted returns of our portfolio of Chinese sample firms versus the three benchmarks above.

Figure 1: Graph of Cumulative Average Adjusted Returns for Chinese Firms Measured Against Various Benchmarks



Among our sample, only one Chinese firm was suspended indefinitely from trading in the middle of the three-year period over which we calculated cumulative average

abnormal returns. No firm was delisted during the three-year period. As such, if we are to consider the ramifications of an indefinite trading suspension to be similar to a delist, only one firm is subject to the delisting bias mentioned in Shumway (1997) and Shumway and Warther (1999). Should we assign a value at which that firm's stock can be bought or sold after it has been suspended from trading, that value can logically only be lower than the last transacted value and thus amplify our results of Chinese firms underperforming their local control firms.

All other Chinese firms with accounting scandals were delisted or suspended from trading more than three years from their listing date, beyond our return calculation period.

6.2. Results based on the wealth relative

Table 5 shows the distribution of the holding period returns over a three-year period for the portfolio of Chinese firms in our sample and the portfolio of corresponding control firms. Holding period returns are positive only from the eighty-fifth percentile upwards for Chinese firms, but they are positive from the sixty-fifth percentile upwards for local control firms. The median holding period return is -52.56% for Chinese firms and -10.99% for local control firms. Chinese firms have a mean holding period return of -25.08%, whereas local control firms have a much higher mean holding period return of 6.08%. The resulting wealth relative value is 0.7012, which implies that for every one dollar in terminal wealth for an investor who invested in local control firms, one who invested in Chinese firms would only have seventy cents.

In terms of a buy-and-hold strategy for a period of three years from the listing date or until December 31, 2011, Chinese firms underperform local comparable firms on average.

Table 5: Holding Period Returns for the Sample Chinese Firms and Local Control Firms Matched by Size and Industry

The holding period return for firm i is calculated as $[P_{i,end} - (P_{i,start} + \sum_{t=1}^5 d_{i,t})]/P_{i,start}$, where $P_{i,end}$ is the price of the firm's stock at the end of the five-year period from the sample firm's listing date or on December 31, 2011, whichever is earlier, $P_{i,start}$ is the closing price of the firm's stock on the sample firm's listing date, and $d_{i,t}$ is the total amount of dividends that the firm distributed in year t .

Percentile:	Three-year Holding Period Returns	
	Sample Chinese Firms:	Local Control Firms:
1	-90.71%	-93.18%
5	-85.56%	-82.07%
10	-84.20%	-68.88%
15	-79.85%	-61.98%
16	-79.24%	-61.71%
20	-76.47%	-56.06%
25	-71.35%	-48.32%
30	-65.30%	-39.13%
35	-62.07%	-33.56%
40	-58.62%	-24.18%
45	-54.76%	-19.42%
50	-52.56%	-10.99%
55	-47.43%	-7.33%
60	-42.23%	-3.77%
65	-36.51%	3.76%
70	-27.23%	19.36%
75	-17.75%	26.81%
80	-1.42%	47.33%
85	25.35%	71.63%
90	61.29%	114.14%
95	150.07%	157.42%
100	357.40%	510.40%

6.3. Results from controlling for the established anomaly of IPO underperformance within the first three years after listing

Upon examining the stock price performance of firms in the United States during their first three years of being listed, Ritter (1991) found out that these firms significantly underperformed a set of comparable firms matched by size and industry from the ninth month onwards. Loughran and Ritter (1995) studied all companies that issued stock between 1970 and 1990 and discovered that IPO stocks significantly underperformed non-IPO stocks for up to five years after listing. IPO stocks had average annual returns of only five percent while non-IPO stocks had average annual returns of twelve percent. As we measured the returns of our Chinese sample firms over the first three-year period since their listing, it is thereby possible that our results are simply reflective of the same established anomaly instead of a “China effect”.

To test the robustness of our results, we use a portfolio of control firms matched by industry and listing date as a benchmark against which we measure the cumulative average abnormal returns of Chinese firms. Control firms are selected in the following manner. For each sample firm, a list of local firms with the same four-digit GICS code is generated. The list is then sorted according to listing date. We choose the local firm that listed right before the sample firm as its control firm. Each local firm may be designated as the control firm for only one sample firm. Should the gap between listing dates of the sample firm and local firm that listed right before it exceed three years, we consider the sample firm to have no control firm and is therefore dropped from the sample.

Table 6 below shows the three-year monthly average adjusted returns and the cumulative average adjusted returns for our portfolio of Chinese firms as benchmarked against the portfolio of most recently listed local firms. Monthly average adjusted returns are still negative for twenty-four out of the thirty-six months in our sample period, although the *t*-statistics are not significant for most months. Cumulative average adjusted returns remain significantly negative from the ninth month until the thirty-sixth month, which shows that the returns from buying and holding our portfolio of Chinese firms are lower than the returns from investing in the most recently listed local comparable firms from the ninth month after the Chinese firms' listing until three years later.

Table 6: Monthly and Cumulative Average Adjusted Returns for Chinese Firms Measured Versus the Most Recently Listed Local Firms

Average adjusted return (AAR) for any month t is calculated as follows: $AAR_t = [\sum_{i=1}^{n_t} (r_{ipo,it} - r_{control,it})] / n_t$, where $r_{ipo,it}$ is the total return on the Chinese firm i in event month t , and $r_{control,it}$ is the total return on the benchmark index. The t -statistic for the average adjusted return is computed for each month as: $AAR_t \times \sqrt{n_t} / sd_t$, where AAR_t is the average adjusted return for month t , n_t is the number of observations in month t , and sd_t is the cross-sectional standard deviation of the adjusted returns for month t . The t -statistic for the cumulative average adjusted return in month t , $CAR_{1,t}$, is computed as $CAR_{1,t} \times \sqrt{n_t} / csd_t$, where n_t is the number of observations in month t , and csd_t is computed as $csd_t = [t \times var + 2 \times (t-1) \times cov]^{1/2}$, where t is the event month, var is the average (over 60 months) cross-sectional variance, and cov is the first-order autocovariance of the AAR_t series.

Month of Seasoning:	Number of Firms:	Average Adjusted Return:	t -stat:	Cumulative Average Adjusted Return:	t -stat:
1	86	-6.27%	-2.35	-6.27%	-2.64
2	86	4.85%	2.08	-1.42%	-0.42
3	86	-3.53%	-1.55	-4.95%	-1.21
4	86	-2.53%	-1.56	-7.48%	-1.58
5	86	-1.98%	-1.10	-9.46%	-1.79
6	86	1.10%	0.59	-8.36%	-1.45
7	85	-1.16%	-0.39	-9.53%	-1.52
8	85	-2.40%	-1.04	-11.93%	-1.78
9	85	-4.43%	-2.02	-16.36%	-2.30
10	84	-2.16%	-0.93	-18.52%	-2.45
11	84	-1.41%	-0.64	-19.93%	-2.52
12	84	-6.38%	-2.53	-26.32%	-3.18
13	84	-0.12%	-0.06	-26.44%	-3.07
14	84	3.50%	1.35	-22.94%	-2.57
15	84	-3.62%	-1.71	-26.57%	-2.87
16	83	2.33%	1.21	-24.23%	-2.52
17	83	-5.61%	-2.69	-29.84%	-3.01
18	83	1.16%	0.46	-28.68%	-2.81
19	82	-3.24%	-1.24	-31.92%	-3.03
20	82	-1.36%	-0.52	-33.28%	-3.08
21	82	0.95%	0.38	-32.33%	-2.92
22	81	-0.79%	-0.33	-33.12%	-2.90
23	81	-1.47%	-0.56	-34.59%	-2.97
24	80	1.36%	0.48	-33.23%	-2.77
25	80	-0.57%	-0.26	-33.80%	-2.76
26	80	4.80%	1.78	-29.00%	-2.32
27	79	-0.83%	-0.30	-29.83%	-2.33
28	77	0.29%	0.13	-29.54%	-2.24
29	75	2.95%	1.25	-26.58%	-1.95
30	75	-1.83%	-0.78	-28.41%	-2.05
31	75	3.49%	1.36	-24.92%	-1.77
32	75	-5.10%	-2.06	-30.02%	-2.10
33	75	-2.06%	-0.95	-32.08%	-2.21
34	75	-2.95%	-1.08	-35.03%	-2.38
35	75	2.57%	0.91	-32.46%	-2.17
36	75	-4.13%	-1.29	-36.59%	-2.41

Table 7 shows the distribution of the holding period returns over a three-year period for the portfolio of Chinese firms in our sample and the portfolio of most recently listed local firms within the same industries. Holding period returns are positive only from the eighty-fifth percentile upwards for Chinese firms, but they are positive from the sixtieth percentile upwards for the most recently listed local control firms. The median holding period return is -52.74% for Chinese firms and -24.31% for the most recently listed local control firms. Chinese firms have a mean holding period return of -29.49%, whereas the most recently listed local control firms have a much higher mean holding period return of 9.28%. The resulting wealth relative value is 0.6453, which implies that for every one dollar in terminal wealth for an investor who invested in the most recently listed local control firms, one who invested in Chinese firms would only have sixty-four cents. In terms of a buy-and-hold strategy for a period of three years from the listing date or until December 31, 2011, Chinese firms underperformed the most recently listed local comparable firms on average.

Table 7: Holding Period Returns for the Sample Chinese Firms and Most Recently Listed Local Control Firms

The holding period return for firm i is calculated as $[P_{i,end} - (P_{i,start} + \sum_{t=1}^5 d_{i,t})]/P_{i,start}$, where $P_{i,end}$ is the price of the firm's stock at the end of the five-year period from the sample firm's listing date or on December 31, 2011, whichever is earlier, $P_{i,start}$ is the closing price of the firm's stock on the sample firm's listing date, and $d_{i,t}$ is the total amount of dividends that the firm distributed in year t .

Percentile:	Three-year Holding Period Returns	
	Sample Chinese Firms:	Most Recently Listed Local Control Firms:
1	-90.71%	-90.43%
5	-87.62%	-81.63%
10	-84.87%	-70.71%
15	-82.91%	-65.52%
20	-79.24%	-62.12%
25	-75.86%	-57.50%
30	-70.58%	-50.85%
35	-66.54%	-47.53%
40	-63.48%	-39.11%
45	-57.74%	-35.71%
50	-52.74%	-24.31%
55	-47.43%	-19.42%
60	-43.12%	0.89%
65	-37.29%	5.30%
70	-31.14%	14.45%
75	-22.12%	35.72%
80	-5.19%	40.98%
85	25.35%	87.85%
90	56.78%	130.97%
95	91.08%	210.61%
100	357.40%	444.21%

These results confirm that the underperformance of Chinese firms listed on SGX when benchmarked against local control firms matched by size and industry is not simply because of the anomaly of IPO firms generally underperforming within the first three years after listing.

6.4. Results from controlling for home bias

Cooper and Kaplanis (1994) calculated the market capitalization of various countries as a percentage of the total global market capitalization and compared these figures against the percentage of each country's equity portfolio in domestic equities. They found that equity portfolios are largely concentrated in the domestic equity market of the investor. Coval and Moskowitz (1999) found that even within the U.S. domestic market, geographical proximity plays an important role in determining portfolio choices. Uppal (2002) noted that an important factor that may be causing home bias is unfamiliarity with foreign firms and the perceived need to expend greater costs and efforts to analyze foreign stocks compared to local ones.

It is highly possible that our results are being driven by home bias. If investors indeed have a home bias, demand for local stocks will push up their prices and the perceived extra costs in analyzing Chinese stocks will also cause investors to discount the prices of Chinese stocks more. Chinese firms will appear to underperform relative to the local control portfolio.

We therefore use a portfolio of foreign firms matched by industry as another benchmark against the portfolio of Chinese firms to rule out the possibility of home bias driving our results. Foreign control firms are chosen by generating a list of firms with the same four-digit GICS code and then by sorting them by listing date. The control firm for each sample firm is chosen to be the firm that is not based in or does

not conduct majority of its business in China or in Singapore and listed most recently before the sample firm. Due to the small number of foreign, non-Chinese firms listed on SGX, Chinese firms with no control firms are dropped from the sample. The final sample consists of only twenty-eight firms.

Table 8 below shows the three-year monthly average adjusted returns and the cumulative average adjusted returns for our portfolio of Chinese firms as benchmarked against the portfolio of most recently listed foreign, non-Chinese firms. Monthly average adjusted returns are still negative for only seventeen out of the thirty-six months in our sample period, and the t -statistics are not significant for most months. Cumulative average adjusted returns are largely positive although insignificant.

Table 8: Monthly and Cumulative Average Adjusted Returns for Chinese Firms Measured Versus the Most Recently Listed Foreign Non-Chinese Firms

Average adjusted return (AAR) for any month t is calculated as follows: $AAR_t = [\sum_{i=1}^{n_t} (r_{ipo,it} - r_{control,it})] / n_t$, where $r_{ipo,it}$ is the total return on the Chinese firm i in event month t , and $r_{control,it}$ is the total return on the benchmark index. The t -statistic for the average adjusted return is computed for each month as: $AAR_t \times \sqrt{n_t} / sd_t$, where AAR_t is the average adjusted return for month t , n_t is the number of observations in month t , and sd_t is the cross-sectional standard deviation of the adjusted returns for month t . The t -statistic for the cumulative average adjusted return in month t , $CAR_{1,t}$, is computed as $CAR_{1,t} \times \sqrt{n_t} / csd_t$, where n_t is the number of observations in month t , and csd_t is computed as $csd_t = [t \times var + 2 \times (t-1) \times cov]^{1/2}$, where t is the event month, var is the average (over 60 months) cross-sectional variance, and cov is the first-order autocovariance of the AAR_t series.

Month of Seasoning:	Number of Firms:	Average Adjusted Return:	t -stat:	Cumulative Average Adjusted Return:	t -stat:
1	28	-0.66%	-0.16	-0.66%	-0.17
2	28	6.28%	1.31	5.62%	1.05
3	28	0.12%	0.04	5.74%	0.88
4	28	-1.78%	-0.53	3.96%	0.52
5	28	-2.54%	-0.68	1.43%	0.17
6	28	5.22%	1.88	6.64%	0.72
7	28	-0.74%	-0.17	5.90%	0.59
8	28	-1.86%	-0.51	4.04%	0.38
9	28	1.82%	0.78	5.86%	0.52
10	27	0.87%	0.36	6.73%	0.55
11	27	-4.19%	-1.17	2.54%	0.20
12	27	-1.58%	-0.52	0.96%	0.07
13	27	1.93%	0.65	2.89%	0.21
14	27	12.07%	3.59	14.96%	1.04
15	27	-0.30%	-0.08	14.65%	0.98
16	26	1.46%	0.34	16.12%	1.03
17	26	-2.66%	-0.83	13.45%	0.83
18	26	6.46%	2.09	19.91%	1.20
19	26	-7.98%	-2.05	11.93%	0.70
20	26	0.11%	0.03	12.04%	0.69
21	26	5.15%	1.54	17.19%	0.96
22	26	5.28%	1.77	22.46%	1.22
23	26	5.57%	1.33	28.03%	1.49
24	26	0.96%	0.29	28.99%	1.51
25	26	-3.98%	-1.00	25.01%	1.28
26	26	5.01%	0.98	30.01%	1.50
27	26	-3.93%	-1.10	26.09%	1.28
28	25	-3.73%	-1.19	22.36%	1.06
29	24	1.40%	0.30	23.77%	1.08
30	24	-0.13%	-0.03	23.63%	1.06
31	24	3.99%	0.52	27.63%	1.22
32	24	-10.82%	-2.43	16.81%	0.73
33	24	-2.11%	-0.40	14.70%	0.63
34	24	1.35%	0.48	16.04%	0.67
35	24	0.15%	0.04	16.20%	0.67
36	24	-6.01%	-1.56	10.19%	0.42

Table 9 shows the distribution of the holding period returns over a three-year period for the portfolio of Chinese firms in our subsample and the portfolio of most recently listed local firms within the same industries. The distribution of the returns for both portfolios is largely similar. The Chinese firms in our subsample have a mean holding period return of -7.48% while the most recently listed foreign, non-Chinese firms have a mean holding period return of -11.74%. The wealth relative is 1.043, which is not far from 1 and thus implies that investing in Chinese firms and in other foreign, non-Chinese firms will yield almost similar returns.

These results imply that there is no significant difference in the returns from Chinese firms and from other recently listed foreign, non-Chinese firms, in which case our earlier results may be attributable to home bias. However, we should interpret this result with caution, as our subsample size is very small with only twenty-eight firms.

Table 9: Holding Period Returns for the Sample Chinese Firms and Most Recently Listed Foreign Non-Chinese Control Firms

The holding period return for firm i is calculated as $[P_{i,end} - (P_{i,start} + \sum_{t=1}^5 d_{i,t})]/P_{i,start}$, where $P_{i,end}$ is the price of the firm's stock at the end of the five-year period from the sample firm's listing date or on December 31, 2011, whichever is earlier, $P_{i,start}$ is the closing price of the firm's stock on the sample firm's listing date, and $d_{i,t}$ is the total amount of dividends that the firm distributed in year t .

Rank:	Three-year Holding Period Returns	
	Sample Chinese Firms:	Most Recently Listed Foreign Non-Chinese Firms:
1	-90.71%	-76.19%
2	-84.95%	-75.60%
3	-75.86%	-74.35%
4	-73.54%	-61.99%
5	-72.90%	-56.43%
6	-58.96%	-49.04%
7	-54.73%	-46.59%
8	-52.79%	-45.65%
9	-51.71%	-44.34%
10	-49.15%	-39.01%
11	-47.43%	-37.50%
12	-43.12%	-25.73%
13	-41.87%	-21.88%
14	-39.68%	-14.64%
15	-37.29%	-10.32%
16	-31.80%	-4.63%
17	-27.17%	-2.68%
18	-23.60%	-1.73%
19	-17.07%	20.58%
20	16.26%	21.28%
21	17.64%	21.70%
22	25.35%	29.31%
23	33.76%	30.98%
24	56.78%	38.47%
25	150.07%	42.03%
26	170.02%	48.86%
27	302.53%	118.09%

7. Accounting irregularities as an explanation of underperformance

In this section, we examine whether the presence of a reported accounting irregularity is significantly related to the long-term underperformance of a Chinese firm.

7.1. Prior research on the stock performance of firms with reported corporate illegalities or accounting irregularities

Prior research has found that reports of corporate illegalities, including financial reporting violations, have a negative impact on the implicated firm's abnormal returns within a short time window after the illegality has been made public.

Davidson and Worrell (1988) conducted a study measuring the impact of corporate illegalities on stock returns. Their sample consisted of all ninety-six firms listed on either the New York Stock Exchange or the American Stock Exchange that had been convicted of blatant illegalities such as bribery, criminal fraud, tax evasion, illegal political contributions, and criminal antitrust violations. They found evidence of statistically significant abnormal returns of -8% for the sample firms on the day that news wire services ran the story of their alleged illegal activities. No other statistically significant abnormal returns were found in various time windows within the period three months before and three months after the announcement.

Delving deeper, Davidson, Worrell, and Lee (1994) calculated the abnormal returns for different categories of corporate illegalities using a sample of 535 announcements of such wrongdoings from the Wall Street Journal. Firms that were the subjects of

announcements of financial reporting violations on average suffered significantly abnormal returns of -2.8% starting from the day before till the day after the announcement was made.

Feroz, Park, and Pastena (1991) measured the abnormal returns of fifty-eight U.S. firms that were the subjects of SEC Accounting and Auditing Enforcement Releases (AAERs). The Accounting and Auditing Enforcement Releases describe the investigations carried out by the Securities and Exchange Commission (SEC) for alleged violations of accounting provisions of the securities laws. As such, the subjects of AAERs allegedly committed accounting violations. Abnormal returns were calculated over a fourteen-day time window around the following three disclosure milestones: (1) the first disclosure date of the accounting reporting violation; (2) the date of the disclosure of the SEC investigation; and (3) the final settlement date of the investigations. They found that on the day that a sample firm was reported in the press to be the subject of a violation of accounting rules, the sample firm's cumulative abnormal returns decreased by an average of 10%, which is statistically significant at the 0.001 level. They interpreted this decrease in cumulative abnormal returns to mean that the market perceives this information to have negative implications for the sample firm's future economic prospects, in line with the analysts' downward revisions of earnings forecasts. The sign and magnitude of the abnormal returns were also found to have a significantly positive correlation to the dollar income effect of the accounting violation. Feroz, Park, and Pastena (1991) also found that on the date of the disclosure of SEC investigations, the sample firm's cumulative abnormal returns dropped further by an average of 5%; this is interpreted to be an incremental market effect that may be related to the negative publicity

brought upon by the formal SEC investigations. No significant abnormal returns were found around the date of the settlement of investigations.

The results of the study by Dechow, Sloan, and Sweeney (1996) concur with those by Feroz, Park, and Pastena (1991). Using a sample of ninety-two firms against whom the SEC brought actions between April 1982 and December 1992, Dechow, Sloan, and Sweeney (1996) found an average stock price decline of 9% on the day that an announcement was released regarding the firm's alleged accounting violation. They also found evidence of increased bid-ask spreads, a drop in analyst following, an increase in short interest, and an increased dispersion in analyst forecasts. These results were interpreted to mean that investors revised downwards their beliefs about the firms' future economic prospects and credibility of financial disclosures, and hence provided indirect evidence that these firms then faced increased costs of capital.

Gerety and Lehn (1997) found smaller but still significant average cumulative abnormal returns of -3.05% for sixty-two firms charged by the SEC for committing financial disclosure violations between 1981 and 1987. The cumulative abnormal returns were measured over a three-day window from the day before till the day after the first public announcement of the disclosure violation.

Errors in previously issued financial statements may need to be corrected by issuing restatements. A firm that issues a restatement can therefore be said to have made an admission that it had not properly followed financial reporting rules previously, possibly intentionally misleading investors. Palmrose, Richardson, and Scholz (2004) studied the market reaction for a sample of 403 firms that issued earnings

restatements between 1995 and 1999. They found a market-adjusted mean abnormal return of -9.2%, which is economically and statistically significant, over the day of and the day after the announcement of the restatement. Restatements that are associated with larger negative abnormal returns are those that involve fraud, are attributed to auditors, affect multiple accounts, and decrease previously reported income by a larger magnitude. Palmrose, Richardson, and Scholz (2004) interpreted these results to be indicative of both diminished company prospects and increased risk from greater perceived information asymmetry between the firm's management and investors.

Hribar and Jenkins (2004) found a corresponding relative percentage increase of 7% to 19% in the cost of capital for a sample of 292 firms that issued restatements from January 1997 to June 2002. This increase in the cost of capital was detected as early as the month following the restatement. It is not known how long it would normally take for the cost of capital to revert to previous levels. Furthermore, similar to Palmrose, Richardson, and Scholz (2004), they found that restatements attributable to external auditors were associated with the largest increase in the cost of capital.

On a different note, Lee *et al.* (2012) found that despite a number of Chinese reverse mergers in the United States being accused of accounting fraud and many of them changing auditors, those accused of fraud experience stock returns indistinguishable from their control firms.

7.2. The stock price performance of SGX-listed firms reported to have accounting irregularities

We try to examine the stock price reaction of SGX-listed firms in the three-day window surrounding the first report in the press of an accounting irregularity.

Among the thirteen firms in our sample, only five firms traded continuously through the period when the first report of an accounting irregularity came out in the press. Table 10 below provides the summary statistics of the daily adjusted returns and the cumulative average adjusted returns, calculated against the sample firms' control firms, experienced by SGX-listed firms when they were first reported in the press to have accounting irregularities.

Table 10: Daily and Cumulative Average Adjusted Returns for Chinese Firms When First Reported in the Press to Have Accounting Irregularities Measured Versus Local Control Firms

Average adjusted return (AAR) for any day t is calculated as follows: $AAR_t = [\sum_{i=1}^{n_t} (r_{firm,it} - r_{control,it})] / n_t$, where $r_{firm,it}$ is the total return on the Chinese firm i in day t , and $r_{control,it}$ is the total return on the corresponding control firm. The t -statistic for the average adjusted return is computed for each day as: $AAR_t \times \sqrt{n_t} / sd_t$, where AAR_t is the average adjusted return for day t , n_t is the number of observations in day t , and sd_t is the cross-sectional standard deviation of the adjusted returns for day t . The t -statistic for the cumulative average adjusted return in day t , $CAR_{1,t}$, is computed as $CAR_{1,t} \times \sqrt{n_t} / csd_t$, where n_t is the number of observations in day t , and csd_t is computed as $csd_t = [t \times var + 2 \times (t-1) \times cov]^{1/2}$, where t is the event day, var is the average (over 3 days) cross-sectional variance, and cov is the first-order autocovariance of the AAR_t series.

Day:	Average Adjusted Return:	t-stat:	Cumulative Average Adjusted Return:	t-stat:
-1	6.34%	1.34	6.34%	1.02
0	-11.66%	-1.63	-5.32%	-0.69
1	-1.39%	-0.44	-6.71%	-0.75

We see a large negative average adjusted return of -11.66% and a decrease in the cumulative average adjusted return of 5.32% on the day that reports of an accounting

irregularity first appeared in the press. These results are consistent with prior findings in the literature. The *t*-statistics are not significant; however, we attribute this lack of significance to the very small number of firms that continued to trade after the report of the accounting irregularity surfaced.

We are unable to measure the effect of the reported accounting irregularity on the stock prices of seven firms which had their shares halted from trading before the report of the accounting irregularity surfaced in the press. Of these seven firms, one firm eventually delisted. The other six firms suspended the trading of their shares before reports of accounting irregularities appeared in newswires as they underwent special audits to ascertain their financial positions and delayed the release of their financial results. Four of these six firms almost went into liquidation as they defaulted on bond payments. All six firms had to seek out new investors and are currently restructuring and reestablishing their operations. Their shares remain under trading suspension as they are still in the midst of preparing their resumption of trading proposals to submit to SGX.

Judging from the defaults on bond payments and threats of liquidation, the prices of these firms' shares would have also declined by a large percentage had the shares been traded continuously. Due to the illiquidity of the shares resulting from the long and drawn-out trading suspension, investors who wish to dispose of their shares would have to do so under deep discounts from the last traded price. Either way, investors in these firms suffered considerable losses. These findings are consistent with those in prior research.

7.3. Regression of relative performance against accounting irregularities

While prior research has mostly found that firms reported to have corporate illegalities, financial reporting violations, and accounting restatements underperform in the short term, it is conceivable for this underperformance to extend to a longer period. As these firms had been less than truthful in the past, investors may become more dubious of any subsequent news released by the firm, leading them to underreact to good news and overreact to bad news. These firms will then continue to underperform relative to the market benchmark or their control firms until their credibility is restored.

We therefore state our first hypothesis in the alternative form as follows:

H₁: A reported accounting irregularity would have a significant negative impact on the long-term relative stock performance of a firm.

Chang *et al.* (2010) also found underwriter reputation to be a significant determinant of post-IPO twelve-month buy-and-hold returns. If so, then an underwriter's disrepute should negatively impact a firm's post-IPO long-term returns. An underwriter's reputation and credibility can be undermined by a report of an accounting irregularity at one of its previous IPO clients. We therefore make the following second hypothesis:

H₁: A reported accounting irregularity at one of the underwriter's clients would have a significant negative impact on the long-term relative stock performance of the underwriter's other clients.

We use the following ordinary least squares regression model to examine whether a reported accounting irregularity is significantly related to the long-term relative stock performance of an SGX-listed Chinese firm:

$$Adj_Ret_i = b_0 + b_1Init_Ret_i + b_2Log_Age_i + b_3IPO_Vol_i + b_4Offer_Size_i + b_5Scandal_i + b_6Underwriter_i$$

Adj_Ret_i is the cumulative adjusted return for the sample firm from its listing date until its three-year anniversary of December 31, 2011, whichever is earlier. We use the following three proxies for *Adj_Ret_i* based on different benchmarks of normal returns: (1) *Adj_Control_i*, which is calculated using the sample firm's control firm as the benchmark; (2) *Adj_FSSTI_i*, which is calculated using the FTSE Straits Times Index as the benchmark; and (3) *Adj_FSTAS_i*, which is calculated using the FTSE ST All Share Index as the benchmark.

We test our first hypothesis using the variable *Scandal_i*, which is a dummy variable that equals 1 if the sample firm was reported in the press to have had an accounting irregularity within three years after going public. A significantly negative coefficient on *Scandal_i* would strongly imply that the presence of a reported accounting irregularity is associated with poorer long-term relative stock price performance of Chinese firms listed on SGX. To determine the sample firms that have been reported

to have had an accounting irregularity, a thorough search for the entire sample period was performed in the Factiva database using various keywords similar to “accounting irregularity”.

We test our second hypothesis using the variable $Underwriter_i$, which is a dummy variable that equals 1 if the following two conditions are met: (1) The sample firm’s underwriter was also the underwriter of another firm that had been reported in the press to have had an accounting irregularity within three years from the firm’s listing date; and (2) The accounting irregularity at one of the underwriter’s other clients must have been reported within the period for which the sample firm’s cumulative market-adjusted return was measured. A significantly negative coefficient would strongly imply that the effect in the underwriter’s reputation from a reported accounting irregularity at one of its IPO clients negatively impacts the long-term relative stock price performance of its other clients. The underwriter of each sample firm was identified through the sample firm’s IPO prospectus posted on the SGX website.

We control for other variables that have been found to have a significant impact on firms’ long-term cumulative abnormal returns.

$Init_Ret_i$ is the market-adjusted initial return of the sample firm, measured as the return of the firm on its first day of trading less the return of the market on that day. Ritter (1991) found that the initial return of a firm is inversely related to its three-year total return. As the cumulative adjusted return is calculated as the total return less the market return, we expect the market-adjusted initial return of a firm to be inversely related to its cumulative adjusted return as well. Other studies that found significantly

negative relations between three-year abnormal returns and market-adjusted initial returns include those of Chi and Padgett (2005), Cai *et al.* (2008), and Chi *et al.* (2010). We predict the coefficient of $Init_Ret_i$ to be negative. We use both the FTSE Straits Times Index and the FTSE ST All Share Index as proxies for the market in calculating market-adjusted initial returns, thereby constructing the variables IR_FSSTI_i and IR_FSTAS_i respectively.

Log_Age_i is the natural logarithm of one plus the age of the sample firm at the time of listing, wherein the age of the sample firm is calculated as the year of listing less the year the sample firm was founded. The year of founding is obtained from the sample firm's IPO prospectus posted on the SGX website. Ritter (1991) found that age significantly explains differences in the total three-year returns of firms with older firms experiencing higher returns. Chen *et al.* (2000) also found that age is a significant determinant of three-year market-adjusted buy-and-hold returns for Chinese IPOs. Both studies interpreted age as a proxy for ex ante risk. We expect the coefficient of Log_Age_i to be positive.

IPO_Vol_i is the number of initial public offerings in the year that the sample firm went public. This variable is calculated by counting the number of publicly listed firms whose listing dates fall within the same calendar year as the sample firm and then scaling the number by 100. Ritter (1991) found that the three-year returns of firms who went public in high-volume years were lower on average than those of firms who went public in low-volume years, as firms appear to take advantage of periods whereby investors are irrationally over optimistic about certain industries. We thus predict IPO_Vol_i to have a negative coefficient.

Offer_Size_i is the total amount of proceeds raised in the sample firm's initial public offering and is calculated by multiplying the number of shares offered and the final offer price. Chi and Padgett (2005) found the coefficient of this variable to be significantly negative in explaining the three-year cumulative market-adjusted returns of Chinese stocks. They interpreted this finding to mean that given the popularity of a firm's stock, the more the supply of the firm's stock, the less is the excess demand and the lower the stock price, and consequently its performance, in the future. Cai *et al.* (2008) and Chi *et al.* (2010) likewise found significantly negative relationships between three-year abnormal returns and offering sizes. We predict the coefficient of *Offer_Size_i* to be negative.

Table 11 below shows the results of our ordinary least squares regression using our sample of Chinese firms. In Panel A, our dependent variable is *Adj_Control_i*. We run the regression twice, the first time using the FTSE Straits Times Index and the second time using the FTSE ST All Share Index as the market proxy. The coefficients of all the variables are not significant, and only the coefficients for *IPO_Vol_i* and *Underwriter_i* resulted in the expected sign. Based on the result outlined in Panel A of Table 6, having a reported accounting irregularity or an underwriter whose other client has a reported accounting irregularity is not significantly related to the long-term relative stock performance of an SGX-listed Chinese firm.

In Panel B, our dependent variables are *Adj_FSSTI_i* and *Adj_FSTAS_i*. The variables *IR_FSSTI_i*, *IR_FSTAS_i*, *IPO_Vol_i*, *Scandal_i*, and *Underwriter_i* resulted in the expected signs; however, only the coefficient for *IPO_Vol_i* is significant. Similar to Ritter

(1991), this implies that firms launch initial public offerings during periods of investors' over-optimism. The variables $Scandal_i$ and $Underwriter_i$ are both insignificant; therefore, based on the results in Panel B of Table 6, having a reported accounting irregularity or an underwriter whose other client has a reported accounting irregularity is not significantly related to the long-term relative stock performance of a Chinese IPO.

Table 11: Multivariate Analysis of the Long-term Cumulative Adjusted Returns and Presence of a Reported Accounting Irregularity

This table presents the results of a multivariate analysis of long-term cumulative adjusted returns and the presence of a reported accounting irregularity. Test variables are set in bold typeface. Note that p -values are two-tailed values. Variables are defined as follows:

$Adj_Control_i$, Adj_FSSTI_i , Adj_FSTAS_i = the cumulative adjusted return for sample firm i from its listing date until its six-year anniversary or December 31, 2011, whichever is earlier, calculated using the sample firm's control firm, the FTSE Straits Times Index, and the FTSE ST All Share Index respectively as the benchmark

IR_FSSTI_i , IR_FSTAS_i = the return of sample firm i on its first day of trading less the return of the market on that day, calculated using the the FTSE Straits Times Index and the FTSE ST All Share Index respectively as the market proxy

Log_Age_i = the natural logarithm of one plus the age of sample firm i , calculated as the year of listing less the year of founding

IPO_Vol_i = the number of initial public offerings in the year that the sample firm went public / 100

$Offer_Size_i$ = the total amount of proceeds raised in the sample firm's initial offering which is calculated by multiplying the number of shares offered and the final offer price

$Scandal_i$ = a dummy variable that equals 1 if the sample firm was reported in the press to have had an accounting irregularity within six years after going public

$Underwriter_i$ = a dummy variable that equals 1 if: (1) the sample firm's underwriter was also the underwriter of another firm that has been reported in the press to have had an accounting irregularity within six years from the firm's listing date; and (2) the accounting irregularity at one of the underwriter's other clients must have been reported within the period for which the sample firm's cumulative market-adjusted return was measured

Panel A					
Dependent Variable: $Adj_Control$		(1)		(2)	
Independent Variables:	Expected Sign	Estimate	p-value	Estimate	p-value
IR_FSSTI	-	0.0469	0.571	-	-
IR_FSTAS	-	-	-	0.0468	0.572
Log_Age	+	-0.0261	0.878	-0.0262	0.878
IPO_Vol	-	-0.5419	0.470	-0.5419	0.470
$Offer_Size$	-	0.0392	0.681	0.0392	0.681
$Scandal$	-	0.5475	0.285	0.5476	0.285
$Underwriter$	-	-0.2645	0.287	-0.2645	0.287
$Intercept$?	-0.6744	0.687	0.6743	0.687
F -value		0.51	0.780	0.51	0.800

Panel B					
Dependent Variable:		<i>ADJ_FSSTI</i>		<i>ADJ_FSTAS</i>	
Independent Variables:	Expected Sign	Estimate	<i>p</i>-value	Estimate	<i>p</i>-value
<i>IR_FSSTI</i>	-	-0.0869	0.132	-	-
<i>IR_FSTAS</i>	-	-	-	-0.0872	0.135
<i>Log_Age</i>	+	-0.0414	0.726	-0.0376	0.752
<i>IPO_Vol</i>	-	-1.0282	0.050	-1.1035	0.038
<i>Offer_Size</i>	-	0.0229	0.729	0.0279	0.676
<i>Scandal</i>	-	-0.1554	0.661	-0.1757	0.624
<i>Underwriter</i>	-	-0.1466	0.395	-0.1382	0.427
<i>Intercept</i>	?	-0.1783	0.878	-0.2073	0.086
<i>F-value</i>		1.34	0.244	1.43	0.207

7.4. Prior research on the lack of a long-term impact of accounting irregularities on stock price performance

Several other studies also appear to have found no long-term impact on stock price performance by reported accounting irregularities.

Davidson and Worrell (1988) did not find any significant cumulative abnormal returns for firms reported to have corporate illegalities beyond the date the announcement was first released in the press. They examined time intervals of up to ninety days after the first announcement in the press.

Davidson, Worrell, and Lee (1994) found significant cumulative abnormal returns for firms with announced blatant corporate illegalities only until the day after the announcement was first made in the Wall Street Journal and again from the day before until the day after the indictment for charges of criminal fraud. They examined twenty-day periods after both the first announcement of the corporate illegality and the date of indictment.

Similarly, Feroz, Park, and Pastena (1991) also found that the abnormal returns from reports of disputed accounting persisted for only two days each on the first disclosure in the press and the disclosure of SEC investigations. There were no further significant abnormal returns found up to five days after the first disclosure to the press and after the disclosure of SEC investigations.

7.5. Possible explanations for the lack of significant relationship between the presence of a reported accounting irregularity and long-term performance

There are two highly possible scenarios are consistent with our finding of a reported accounting irregularity not being significantly related to the long-term relative stock performance of a firm.

The first possible scenario is one wherein the contagion effect of an accounting irregularity is prevalent. The contagion effect can manifest due to two reasons. The first reason is that a reported accounting irregularity in one firm signals trouble for other similar companies. Investors may consider the root cause of the accounting irregularity to be common across all other similar companies and therefore lower their expectations of profitability for all firms in the same category. (Xu, Najand, & Ziegenfuss, 2006) The second reason is that a reported accounting irregularity can cause investors to alter their perceptions of the accounting quality of all other firms with the same characteristics as the implicated firm. (Gleason, Jenkins, & Johnson, 2008) Investors' perception of the accounting quality of firms with the same business environments, auditors, or underwriters may become lower than before. Lower

expected profitability and perception of accounting quality would cause the stock prices of similar firms to fall with that of the implicated firm.

Gleason, Jenkins, and Johnson (2008) found evidence of the contagion effect in a sample of 919 restatements between 1997 and 2002. Accounting restatements which resulted in lower share prices for the restating firm were associated with small but statistically significant share price declines among non-restating peer firms; moreover, the price decline among peer firms appears to be unrelated to changes in analysts' forecasts which were used as proxy for altered expectations of future profitability.

Applying the contagion effect in the context of our study, a reported accounting irregularity in one Chinese firm may signal to investors the problem of weak corporate governance. Investors may then consider weak corporate governance to be common across most, if not all, Chinese companies. They may therefore lower their expectations of profitability for Chinese firms and also reassess and lower their perception of accounting quality across all Chinese companies. Investors' lower expectations of profitability and perception of accounting quality will translate to lower returns for all Chinese firms, regardless of whether they were directly implicated in a reported accounting irregularity. Such a scenario will render the coefficients of our test variables $Scandal_i$ and $Underwriter_i$ insignificant.

The second possible scenario is that firms with reported accounting irregularities were able to restore investors' trust by improving their corporate governance and therefore have been able to recover their share prices to what they should be had the accounting irregularity not been discovered and reported. Farber (2005) found that firms that

committed financial fraud were able to improve their corporate governance to levels comparable to their peer firms within three years after the fraud detection. Firms that improved their corporate governance structures after fraud detection were also able to recover their share values; they experienced positive and economically significant long-run buy-and-hold abnormal returns in the three-year period following fraud detection. (Farber, 2005)

If the firms in our sample also improved their corporate governance structures within our sample period after the report of an accounting irregularity, their stock prices would have also recovered. The stock price decline from the initial report of the accounting irregularity would have been reversed, and the report of the accounting irregularity would not have a significant effect on its long-term relative stock price performance. The coefficients of our test variables *Scandal_i* and *Underwriter_i* would then be insignificant.

8. Conclusion

The significant presence of Chinese firms on SGX make it worthwhile to examine whether investors earn more returns from investing in Chinese firms compared to investing in comparable local firms. Investors can potentially earn more returns from investing in Chinese firms as it gives them access to the large profit potential in the rapidly growing economy of China. However, the many accounting scandals erupting in Chinese firms have undermined investor confidence and caused declines in these firms' stock prices. To the best of my knowledge, this study is the first to examine empirically the returns made by investors from investing in Chinese firms listed on SGX vis-à-vis investing in comparable local firms.

Our sample consists of all Chinese firms that listed on SGX from 2002 to 2011. We examine the cumulative average abnormal returns of our portfolio of sample Chinese firms as calculated against the abovementioned benchmarks. We focus on long-term performance of up to three years after listing. As the cumulative average abnormal returns over three years of our sample portfolio are significantly negative, we therefore conclude that investing of Chinese firms on SGX yields less return for investors compared to investing in comparable local firms.

We further test the robustness of our results against the established anomaly of IPO long-term underperformance by comparing the returns from investing in a portfolio of Chinese firms with the returns from a portfolio of the most recently listed local firms within the same industry as the sample firms. Chinese firms still underperformed this benchmark.

We also control for home bias and compare the returns of our sample portfolio of Chinese firms against the returns of a portfolio of most recently listed foreign non-Chinese firms. There appears to be no significant difference between the returns of these two portfolios, which implies that our earlier results are being driven by home bias. However, we must interpret this result with caution, as the lack of significant difference could potentially be due to the very small sample size of twenty-eight firms.

We also examine whether the presence of a reported accounting irregularity is significantly related on average to the long-term underperformance of an SGX-listed Chinese firm. In our regression of the Chinese firms' cumulative abnormal returns versus a dummy variable indicating the presence of a reported accounting irregularity, we find the coefficient of the said dummy variable insignificant. This lack of a significant relationship may be due to the contagion effect whereby all Chinese firms would have suffered significantly negative returns, as investors perceive the root cause of the reported accounting irregularity to be common across all Chinese firms. It may also be due to substantial improvements in the implicated firms' corporate governance, which could have restored investors' confidence in the firms and consequently the firms' stock prices.

Future research can perhaps examine more closely the reason why Chinese firms listed on SGX underperform other recently listed local comparable firms. One avenue worth exploring is the adverse selection problem for SGX as Chinese firms seem to prefer listing in Hong Kong and will only come to Singapore for listing when it knows it will not be able to list on the Hong Kong Stock Exchange. Future research

can also examine the lack of a significant relationship between long-term performance and the presence of a reported accounting irregularity for our sample of SGX-listed Chinese firms.

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