

The Market for “Lemons”: A Study of Quality Uncertainty and the Market Mechanism for Chinese Firms Listed in the US

Randolph Beatty
Accounting Circle Professor of Accounting
Leventhal School of Accounting
University of Southern California
rbeatty@marshall.usc.edu

Hai Lu
Associate Professor of Accounting
Rotman School of Management
University of Toronto
hai.lu@rotman.utoronto.ca

Wei Luo
Associate Professor of Accounting
Guanghua School of Management
Peking University

This Draft: January 1, 2013

We are grateful to Jeff Callen, Agnes Cheng, Masako Darrough, David Harris, Gordon Richardson, Tianyu Zhang, and the participants of the panel discussion at the 2013 AAA annual conference, the USC PhD alumni symposium, the seminars at the Chinese University of Hong Kong, City University of Hong Kong, Hong Kong Polytechnic University, Peking University, University of Toronto, and Zhejiang University for their comments. We thank Social Sciences and Humanities Research Council of Canada and National Natural Science Foundation of China (71272035, 71273013) for financial support.

The Market for “Lemons”: A Study of Quality Uncertainty and the Market Mechanism for Chinese Firms Listed in the US

ABSTRACT

Akerlof's (1970) seminal work provides a framework for a market failure and discusses the consequences of quality uncertainty. We hypothesize and find that a classic “Lemons” market occurred in recent Chinese IPO firms listed in the US. Our study provides empirical evidence of a severe market failure that has rarely been documented in the literature - Chinese firm US IPOs became almost extinct by 2012. Our tests reveal that there is little difference in *ex ante* observable characteristics of “good” (non-fraudulent) versus “bad” (fraudulent) firms when the Chinese IPO firms went public while entrepreneurs know their type as suggested by their *ex post* privatizations. Our evidence indicates the existence of severe information asymmetry and substantial cost of dishonesty. We find little evidence that traditional market mechanisms such as short selling behavior, auditor quality or underwriter reputation provide credible signals of firm quality. We further find that factors capturing potential *ex post* settling up costs such as North America sales and CEO's US education are less likely associated with financial frauds. Our findings support the efforts of Chinese and U.S. regulators in removing information search barrier and increasing enforcement cooperation.

The Market for “Lemons”: A Study of Quality Uncertainty and the Market Mechanism for Chinese Firms Listed in the US

I. INTRODUCTION

Numerous studies in economics have examined the impact of information asymmetry in markets (e.g., see Stiglitz 2000, Riley 2001). Among those studies, George Akerlof’s (1970) seminal work lays out the characteristics of a “Lemons” market and discusses the consequences of quality uncertainty for market failure. He argues that the presence of asymmetric information may result in thin or nonfunctioning markets. The concept of a “Lemons” market has since been widely accepted and applied to many fields such as automobile, insurance, and labor markets. A “Lemons” market is characterized by a number of key features such as quality uncertainty, information asymmetry, economic costs of dishonesty, the market mechanism, and in the extreme, market failure.

We often see how information asymmetry affects the operating efficiency of economic activities but rarely observe a complete market breakdown. Either market mechanisms or regulations prevent markets from total failure because significant information asymmetry can be mitigated by active private information search of economic agents or the mandatory disclosures required by regulators. In the US capital market, we occasionally observe misrepresentation and financial fraud among public companies (e.g., Enron, WorldCom, and Countrywide.), but these incidents tend to be sporadic and has not led to wide spread collapse of investor confidence in public markets.

The market for recent Chinese IPO firms listed in the US is an exceptional case and exhibits the features highlighted in Akerlof’s “Lemons” market framework.

Rampant financial misrepresentations were discovered among the Chinese firms listed in the U.S. in 2010-2011. The large scale of detected frauds significantly eroded investor confidence and precipitated a dramatic market collapse. Our study documents pervasive negative equity returns, severely constrained liquidity, and very few new Chinese firm US IPOs (only 2 in 2012). This severe market deterioration imposes significant challenges for regulators in both the U.S. and China. In a globalized economy, market failure has the potential to impose significant costs on firm owners, debt holders, and other stakeholders.¹ Thus, it is important to study the Chinese IPO firm market collapse of 2012 to provide insights into the antecedents of market failure in the global context.

In this study, we take advantage of the group of Chinese firms listed in the US as a natural experiment to empirically examine the effect of quality uncertainty on the market for equity securities. Specifically, we examine information asymmetry, costs of dishonesty, and the functioning of the US securities market mechanism. Our sample consists of 279 Chinese firms traded on NYSE, AMEX, and NASDAQ.² We classify “good” and “bad” firms with three different levels of constraint: “Bad” firms are those firms subject to 1) SEC litigation during 2000-2012; 2) SEC litigation or class action lawsuit during 2000-2012; 3) SEC litigation or class action lawsuit or accusation of fraud by major US media during 2009 -2012. We consider the defined “bad” firms as “Lemons” and classify the remaining firms as “good”. This binary classification is the basis of a series of tests leading to the following findings.

First, we find that investors are not able to infer whether a firm is “good” or “bad” using traditional signals of quality. These signals include a firm’s stock returns,

¹ The Asian flu of 1997, Dot Com bubble of 2000, and the great recession of 2008 provide recent reminders of the havoc induced by significant market turmoil.

² These firms include both IPOs and reverse mergers. A reverse merger allows a firm to become publicly traded by having a shell company from a public exchange merge with a non-listed company.

fundamental earnings performance, measures of accounting quality, and external monitoring mechanisms such as auditor quality and underwriter reputation. In contrast, our results suggest that entrepreneurs know their types. A number of firms announced privatization plans in 2011 after the revelation of a number of Chinese firm frauds. Some entrepreneurs were willing to pay large premiums of 36.8% to exit the U.S. market after their firms suffered significant market losses. This evidence suggests significant information asymmetry between investors and entrepreneurs. Upon revelation of the existence of “lemons” in the market, we document pervasive negative returns (-64.85% for 2011- 2012), a significant 74% decrease in liquidity, and a precious few (2) Chinese IPOs in 2012.

Second, we conclude that the dishonesty of “bad” firms spread suspicion to all other “good” Chinese firms listed in the U.S. We identify a number of significant events and issuance of short sales reports for specific companies and find that the firms other than the targeted firm are impacted. For example, Citron Research published a critical research report on Harbin Electric Inc. on June 17th, 2011. The entire group of US-listed Chinese firms responded with negative returns of 6.07%. Both “good” and “bad” firms suffered substantial losses. This broad indictment of Chinese IPO firms made it very costly for new firms to raise capital, suggesting that the credibility of all Chinese firms and entrepreneurs are affected.

Third, we investigate several market monitoring mechanisms to determine if these mechanisms are effective in separating “good” from “bad” firms. Akerlof (1970, pp 499) suggests that counteracting institutions such as guarantees, reputation, and licensing mitigate the effect of information asymmetry. We examine whether these mechanisms are effective in the Chinese US IPO market at the time these firms entered the US market. We find that a number of proxies for these mechanisms such

as short selling behavior, auditor quality, and underwriter reputation did not function well. We further explore a unique set of factors affecting the incentives of managers to manipulate information about their firms. Our results suggest that internal bonding measures are effective differentiators. Specifically, we find that the firms with North America sales revenue and CEOs with North America education are less likely to misrepresent their financial position.

Our study contributes to the literature on several dimensions: First, it is one of the few empirical studies documenting the failure of a market. In a market in which information is difficult to verify, many of the most important features highlighted in Akerlof's framework are documented. Prior studies in information economics largely focus on stable and well-functioning markets. Market failure is rarely observed in these markets. In the automobile market, for example, the existence of some lemons has not driven good cars out of the market because information search and monitoring mechanisms appear to be effective. However, using the Chinese firm US IPO market, we show that severe information frictions and regulatory limitations can lead to a market breakdown.

Second, the findings have implications for regulators in both the U.S. and China. Expanded global markets provide opportunities for investors to be more diversified reducing overall risk of investment portfolios. Thus, US investors exert demand for exposure to global firms. Since the Chinese economy is the second largest in the world, access to this large and growing economy can only enhance the opportunities for US investors. Understanding which market monitoring mechanisms are effective is an important first step to design more effective regulation of global equity markets. Our evidence suggests that regulators should explore the benefits and costs of entrepreneurs committing frauds and design regulations and approaches to provide

oversight that rewards transparency and sharing of information across national boundaries. National sovereignty concerns appear to be a profound obstacle to effective regulation of the Chinese IPO market in the US. Without a well functioning market for information including effective monitoring and legal recourse, market failure is a realistic possibility.

Finally, our study is different from other recent work which examines various issues related to U.S. listed Chinese firms. These other studies focus on specific aspects of this market such as earnings quality, fundamental performance, and price response. Lee, Li, and Chang (2013) show that Chinese reverse merger firms outperform their matched US peers from inception through 2011. Chen, Cheng, Lin,, Lin and Xiao (2012) find that Chinese reverse mergers exhibit inferior financial reporting quality than US firms while other studies show the opposite (Givoly, Hayn, and Lourie 2012; Pollard 2013). When there are massive financial statement misrepresentations (e.g., inflating assets) the existing accounting quality measures are less likely to capture the operating activities of these firms. It is thus not surprising that there is relatively little difference in ex ante observable characteristics of good firms versus bad firms. Darrough, Huang, and Zhao (2013) show that the fraud revelation has a spillover effect, i.e., clean firms suffer from significant stock price declines when investors learned of the revelation of frauds in other firms. Our study extends the information spillover effect by taking a more holistic approach to understand the antecedents and consequence of market mechanism failure.

Section II describes the background of Chinese IPO firms. Section III presents our sample and research design. Section IV presents our empirical tests and results. Section V concludes.

II. Institutional Background and Literature

A. Institutional Background

Chinese firms started to go public globally in the 1990s. Qingdao Beer became the first Chinese IPO on the Hong Kong Stock Exchange on June 29, 1993 and Sinopec Shanghai Petrochem was the first Chinese firm listed on NYSE on July 26, 1993. From 1993 to 2001, the main source of the overseas listed Chinese firms was State Owned Enterprises (SOE). Because overseas listings need special approval from the China Securities Regulatory Commission (CSRC), IPO decisions are largely affected by noneconomic factors such as political connections, geographical quotas, and industry status (Hung, Wong, and Zhang 2012).

The first privately controlled firm from China (Qiao Xing Universal Resources) went public in the U.S. on February 17, 1999. Since then, private Chinese firms dominate SOEs in the US IPO market and have become the major players in foreign capital markets. For example, there were only 3 US IPOs by Chinese SOEs after 2001, compared to more than a hundred IPOs by private Chinese firms.

CSRC imposes strict and different requirements for the firms listed domestically in China than internationally (CSRC 1999, 2006, 2009, 2012). These requirements consist of financial performance, as well as political and government policy considerations. The Chinese government specifies industries in which foreign investments are encouraged, restricted or prohibited. For example, foreign investors cannot invest directly in some industry sectors such as Internet, Telecommunication, Media, and Technology (National Development and Reform Commission and Ministry of Commerce 2004, 2007, 2011). Strict control over foreign investments by the Chinese government weakens access to foreign financing.

Chinese entrepreneurs creatively bypass the CSRC regulations through the Variable Interest Entity (VIE) corporate structure. Entrepreneurs set up an offshore company in a tax heaven such as the Cayman Islands, and then register a Chinese subsidiary in China as a wholly foreign owned enterprise (WFOE). The WFOE, the entrepreneurs, and the existing Chinese domestic company sign a series of contracts so that the WFOE transfers resources into the domestic firm operating in the industry sectors not open to foreign investors. Therefore, the WFOE has the right to claim the economic benefits from the domestic firm and has substantial impact on its operation.³ SINA Corp. was the first firm to adopt a VIE structure for its IPO on April 13, 2000. Following this innovation, all Chinese firms from restricted industry sectors use this structure to list in the US market. The VIE structure remains controversial because it only provides foreign investors contractual control rather than real equity control over the Chinese business. If the contracts are breached, then the shareholders of the offshore company lose control of the domestic company. The recent dispute between Alibaba and Yahoo! over the ownership of Alipay illustrates potential problems with this corporate control structure (Chao and Efrati, 2011).

In the last few years, Chinese entrepreneurs have chosen another quick and inexpensive approach, the reverse merger, to access US capital markets. When a Chinese firm is acquired by a shell firm publicly traded in the US stock exchange and the Chinese firm has control of the shell company, the Chinese firm effectively becomes a public firm listed in the US.⁴

These innovative approaches to circumventing Chinese governmental restrictions create uncertainty about ownership and the managerial willingness to

³ According FASB Interpretation No. 46 “Consolidation of Variable Interest Entities”, which became effective in 2002, the offshore company can consolidate all economic activities of the US domestic company into its financial statements.

⁴ This approach avoids the scrutiny of the SEC inherent in the registration process with the SEC.

follow conventional norms of behavior. Thus, it is not surprising that there is substantial information asymmetry in the Chinese firm US IPO market.

It is worth noting that the Chinese market is not a well-functioning free market, and a domestic Chinese IPO requires special state approval. Also, privately controlled firms in China find it very difficult to borrow money from local banks (Allen et al. 2005) and the existing debt market is small (Allen et al. 2013). Regulators have discouraged IPOs in China for certain industries and there is limited prior experience with US equity markets. Chinese firms listing in the US markets have unique challenges that make them more likely to pursue an aggressive strategy. So, we investigate how these firms behave as market participants discover substantial departures from a typical well-functioning information structure.

B. Related Literature

A firm's financing decision involves the choice of debt vs. equity and private vs. public market. A number of studies examine the determinants of the IPO decision. The determinants proposed include corporate control (Zingales 1995, Black and Gilson 1998), no liquidity discount (Chemmanur and Fulghieri 1999), and market timing (Lerner 1994, Pagano, Panetta, and Zingales 1998). The Information environment also plays a significant role in the IPO decision. Myers and Majluf (1984) show that asymmetric information leads to a pecking order for external financing, i.e., managers with more information have the tendency to choose internal finance and prefer debt to equity if external financing is required. Gomes and Phillips (2012) show empirically that the choice of securities type in public markets is associated with the degree of information asymmetry. Prior studies also suggest that firms signal their quality by underpricing at the time of IPOs (e.g., Beatty and Ritter 1986, Allen and Faulhauber 1989, Grinblatt and Hwang 1989, Welch 1989, and Jegadeesh, Weinstein,

and Welch 1993). Overall, the nature of the information environment is a recurring theme in this literature. Thus, we focus our attention on the classic Akerlof (1970) asymmetric information explanation for the Chinese firm US IPO market failure of 2011.

III. Research Design and Sample

A. Research Design

Our tests are designed to assess the vibrancy of the US market for Chinese firms after revelations of numerous accounting irregularities in US listed Chinese firms. Specifically, we examine the issues framed in Akerlof's seminal characterization of a "Lemons" market: market failure, information asymmetry, costs of dishonesty, and the market mechanism.

A necessary condition to observe a market failure is that the market has a significant number of "Lemons." Upon revelation of the discovery of these "Lemons", we expect market disruption to occur. So, our first tests examine stock returns, liquidity, and accessibility of the IPO market for Chinese firms in the periods before and after the 2011 scandal.

Our second tests are designed to examine whether there is severe information asymmetry between investors and entrepreneurs. An important feature of information asymmetry in a "Lemons" market is the inability of investors to differentiate a "good" from a "bad" firm. We examine whether investors and entrepreneurs know a firm's type. For investors, we analyze the relation between the likelihood of a firm being "bad" and the traditional signals such as a firm's fundamental performance, earnings quality, and monitoring mechanisms, which investors use to infer type. For entrepreneurs, we investigate their decision to exit this market. A number of

entrepreneurs announced their privatization plans after the scandal. If these privatized firms are “good” firms but cannot be inferred from *ex ante* observable signals, we conclude that there is severe information asymmetry between investors and entrepreneurs.

Our third tests are designed to test for costs of dishonesty. We identify a number of significant events and issuance of short sales reports for some specific US-listed Chinese firms and examine whether the stock price of other Chinese firms react to these events. If the entire portfolio of Chinese firms declines, returns are significantly negative whether the firm is “good” or “bad”, we can infer that there is a significant cost of dishonesty – i.e., “good” firms are also being tarnished.

Our final tests examine the effect of market mechanisms seeking to overcome the information asymmetry problem. We examine the effect of both external and internal mechanisms. We consider short sellers’ behavior, auditor quality, and underwriter reputation to assess the impact of external mechanisms. Our measures of internal mechanisms include the North American sales or CEO’s educational background. While the proxies for external monitoring mechanisms are common in the literature, the proxies for internal mechanism are new, which capture entrepreneurs’ incentives for manipulating the firm’s performance.

B. Sample

We compile a sample of US listed Chinese companies from three different sources: (1) WIND database provided by Wind Information Co., Ltd — a leading service provider of financial data in China; (2) CV Source database provided by ChinaVenture who is a leading investment consulting firm in China; (3) Compustat. WIND covers 257 active and 43 inactive companies listed on the US market on December 31, 2011. From CVSource, we identify all the listing transactions related to

AMEX, NASDAQ, and NYSE for the period of 1994 to 2011. These transactions indicate typical IPOs and changes in listing market (e.g., from OTC to NASDAQ). By comparing these transactions to the WIND list, we identify an additional 12 Chinese firms. Furthermore, we also include 4 more firms in our sample from Compustat but not included in the WIND and CV Source. We exclude 19 cross-listed firms, four non-Chinese firms, nine firms from Hongkong, Macau, and Taiwan, two Chinese funds, and three Special Purpose Acquisition Companies (SPACs) after reviewing corporate profiles. As a result, our final sample includes 279 US listed Chinese companies.

We hand-collect information on whether a Chinese firm is listed through the IPO process or a reverse merger transaction. We read through registration statements (S-1 or prospectus) to confirm each IPO transaction. The NYSE and Nasdaq published a list of 84 Chinese reverse mergers.⁵ For the remainder of our sample, we review Form 8-K Item 5.06 to identify reverse mergers. For those firms which did not disclose Item 5.06, we read through corporate history in their annual reports. We identify 140 firms entering the US market through the IPO process and 139 firms entering through a reverse merger.

Financial data and stock returns are extracted from Compustat and the CRSP databases. We hand-collect from SEC filings information on governance characteristics and ownership structure in listing year, offering price, IPO proceeds, and underwriters of US listed Chinese IPO firms. Short sales transaction data is provided by the Financial Industry Regulatory Authority (FINRA).

We use three approaches to identify whether a firm is suspected of accounting fraud. First, we collect information on SEC litigation from the SEC Accounting and Auditing Enforcement Releases (AAER) and other litigation during 2000-2012.

⁵ <http://www.bloomberg.com/news/2011-06-22/table-of-chinese-reverse-merger-companies-listed-on-u-s-stock-exchanges.html>.

Second, we identify class-action lawsuits from the website of Stanford Securities Class Action Clearinghouse. Third, we search in Lexis-Nexus for financial fraud or improper accounting practice alleged by major financial press or by publicly published research reports.

Table 1, Panel A describes the sample selection process. For each company in our sample, we read through its history and company structure in SEC filings. We identify a firm as a variable interest entity (VIE) firm if SEC filings mentioned or described this unique structure.⁶ Panel B indicates that 41% (115 firms) adopt a VIE structure (83 IPO and 32 reverse merger firms). Panel C shows that the sample firms have an offering date market capitalization of \$136.52 billion, among which IPO firms represent 83% (\$113.52 billion) of the total market capitalization. Although reverse merger firms have garnered a great deal of regulatory concern, it seems that these firms are a relatively small proportion of the overall US listed Chinese firms. Panel D presents frequencies of fraud charges from each approach. Fifteen of twenty-one SEC litigations are against reverse merger firms, while only six are against IPO firms. Seventy-six percent of SEC litigations results in delisting. Eighty-two firms are charged for accounting irregularities by either SEC or shareholders (class action), among which are fifty reverse merger firms and thirty-two IPO firms. Sixty-five reverse merger firms and fifty-four IPO firms are suspected of wrongdoing by the SEC or shareholders or journal articles. These results suggest that a substantial proportion of our sample has elicited concern of financial irregularities. Furthermore, the suspicion of misrepresentation afflicts both reverse mergers and IPO firms.

(Insert Table 1 here)

⁶ See Section 2 for an explanation of the VIE structure.

Table 2 shows the distribution of sample firms by listing year. Chinese firms started to list through reverse mergers as early as 2000, but the cases were rare until 2004. The number of reverse merger firms exploded between 2007 and 2010, and reached the highest number of 46 in year 2009. In contrast, listing through the IPO process dates back to the early 1990s, halted during the market recession of 2001-2003, recovered after 2004, and reached a maximum of 40 in 2010.

(Insert Table 2 here)

IV. Quality Uncertainty and the Market Mechanism

A. Chinese Firms Listed in US

Panel B of Table 2 compares US listed Chinese firms with the firms listed in China and those listed in Hong Kong. The Hong Kong IPO market is the largest for Chinese firms listing overseas and the US IPO market is the next largest. The number of IPOs by Chinese firms in the US market peaks in year 2010, and their gross proceeds were slightly higher than 10 percent of total IPO proceeds in the US market. Whereas there were sixty-one offerings by Chinese firms in Hong Kong, offerings in the US market decreased dramatically to only two in 2012. In addition, the 2012 Chinese firm global IPO proceeds increased 150 percent from 2010 to \$5.32 billion in Hong Kong but dropped an astounding 96 percent to \$0.15 billion in the US market. These results suggest that the Chinese firm accounting irregularities seriously damaged the US IPO market for Chinese firms.⁷

To give an evolutionary view of the stock returns, we construct a portfolio of all Chinese firms in our sample, and calculate equal-weighted buy and hold returns. Figure 1 presents the cumulative raw returns for the period from January 2, 2009 to

⁷ Chinese regulator (CSRC) has stopped approving any IPO applications since October 11, 2012 and asked all IPO applicants' underwriters and auditors to self-review the financial information of the firms.

December 31, 2011. The market experienced a significant rise and fall capturing optimistic investor expectations at the beginning of the period and a market collapse at the end. Figure 1 shows that the buy and hold raw return plummeted from 60 percent at the beginning of 2011 to negative twenty percent by the end of 2011. This precipitous decline in buy and hold returns suggests that the entire market for Chinese firms listed on US exchanges was impacted by a pervasive exogenous shock.

(Insert Figure 1 here)

Table 3 presents the descriptive statistics for the full sample (both IPOs and reverse mergers) and subsample of IPO firms in the listing year. Slightly more than half of our sample firms went public through the IPO process. 41.2 percent of all firms adopt the VIE structure to control their operations in China, whereas 59.3 percent of the IPO firms are structured as VIEs. Firms on average are 8 years old on the listing date. The sample firms appear to be profitable and growing business enterprises in the listing year, with 7.1 percent ROA, 9.4 percent ROE, and 95.9 percent sales growth (*Growth*). Only 14.4 percent sample firms have losses (*Loss*) in the listing year. Operating cash flows (*CFO*) has a positive mean of 0.059, indicating that sample firms generate positive net cash flows from their operating activities. The sample firms have low total accruals as 1.6 percent of total assets. The sample firms have a mean of 0.512 for book-to-market ratio (*BM*), and a mean of 0.086 for EBIT/Price. While 48 percent of the sample firms have Big 4 auditors, most of IPO firms (85.5 percent) hire big 4 auditors. 15.9 percent of the sample firms have non-standard audit opinion in the listing year. The average stock holdings by institutional investors are 6.6 percent of outstanding common shares at the end of the quarter in which a firm gets listed. Overall, the sample descriptive statistics suggest that Chinese

firms listing in the US appear to be established and profitable and exhibit reasonable control mechanisms

(Insert Table 3 here)

We further investigate whether US listed Chinese firms are comparable with their peer US IPO firms. For each sample year, we identify new firms in the CRSP dataset and compare Chinese firms to other US firms. Panel A of table 4 shows that Chinese IPO firms are systematically different from other US listed firms. Chinese firms have smaller size, leverage, and growth rates than US firms. However, Chinese IPO firms appear to be more profitable, less likely to have losses, better operating cash flows, and higher market valuation. Finally, Chinese firms are more likely to hire Big 4 auditors and have standard unqualified opinion in their audit report. Panel B of Table 4 presents the survival rates three years after listing. On average, Chinese firms listed in the US have similar survival rates to other US firms. Chinese IPOs are more likely to survive than US peers. However, reverse mergers are less likely to survive, consistent with the results from US reverse mergers (Adjei, Cyree, and Walker 2007). After three years, 89 percent of Chinese IPOs and 74 percent of US IPOs survive but only 68 percent of reverse mergers continue to exist. These observed relations suggest that Chinese US listed firms may be more profitable, older, less risky, and more likely to survive than similar US newly listed firms. As will become apparent in later tests, these observations depend crucially on financial reporting quality.

(Insert Table 4 here)

B. Market Failure

Several short sellers started to publish negative reports on Chinese firms listed in the U.S. in 2011. On April 26, 2011, Citron Research accused Longtop, a software firm listed on the NYSE, of falsely claiming substantial cash and sales revenue. The

accusation of financial fraud at Longtop eventually proved to be true, and the company became the first Chinese company delisted on a major US exchange. Numerous Chinese companies were the subject of allegations of financial statement misrepresentations following Citron Research's Longtop report. The cases include Harbin Electric Inc. (Citron Research) and Sino-Forest (Muddy Waters), and others. These salient cases attracted a great deal of attention from media, investors, and regulators. Eventually, a substantial number of Chinese firms were investigated by the SEC, involved in class action lawsuits, or mentioned by major media. A number of fraud types were claimed by the SEC, investors involved in class action, or media.⁸

The market responded to the massive frauds quite dramatically. Table 5 presents cumulative abnormal returns, turnover, and IPO proceeds from 2004 to 2012. While turnover shows a declining trend after 2008, returns and IPO proceeds are volatile. The market-adjusted abnormal returns for Chinese firms are -46.29% and -18.56% in 2011 and 2012, respectively. Turnover declined from .036 in 2004 to 0.0095 in 2012, suggesting a dramatic decline in liquidity by 2012.

(Insert Table 5 here)

Market failure is consistent the observation that only two firms tapped the 2012 US IPO market with IPO proceeds of 0.15 billion in total. After seven months since the last Chinese IPO in the US, Vipshop Holdings Limited (VIPS) went public on March 23, 2012 with an offering price of \$6.5, significantly below its expected price range of \$8.5 to \$10.5; raised gross proceeds of \$71.5 million, 40 percent less than its plan of \$125 million. Its stock price closed at \$5.5 on the offering date on the NYSE, 15.38 percent below its IPO price. On November 21, 2012, another firm, YY Inc., went public in the US with an offering price of \$10.5, at the lower end of its

⁸ The fraud charges include inflating revenue or assets, CEO theft, market manipulation, failure to disclose, related party transaction, GAPP violation, internal control deficiencies, and many more.

expected range of \$10.5 to \$12.5. Its first-day price closed at \$11.31.. The US market became very difficult for Chinese firms in the fall of 2012 that China Mobile Games and Entertainment Group Limited (CMGE) withdrew their equity offering plans and listed on Nasdaq on September 25, 2012 without issuing new shares. Since it did not issue any equity and go through the regular IPO process, US investors were unable to observe a fair price for the company, which resulted in no trades on the listing day.

C. Information Asymmetry

C.1. Variables

Information asymmetry in this market suggests that Chinese entrepreneurs know their firm type while investors do not, or vice versa.⁹ We construct three measures of fraud charges for subsequent analyses: SEC-dummy variable is 1 if a firm faces any SEC litigation regarding accounting issues during 2000-2012; Action-dummy variable is 1 if a firm faces either SEC litigation or class action lawsuits regarding accounting issues during 2000-2012; Charge-dummy variable is 1 if a firm faces any charge from SEC or shareholder lawsuit during 2000-2012 or media charge during 2009-2012. The firms without SEC litigation, class action lawsuit, or media accusation are considered “good” firms. To test whether investors can differentiate between “bad” firms and “good” firms, we compare observable firm characteristics in the listing year for the firms that ultimate experience frauds with those without frauds. These firm characteristics include proxies for fundamental performance, earnings quality, and monitoring mechanisms.

We assign an indicator variable, IPO that equals to 1 if a firm listed in the US through the IPO process, and zero otherwise.¹⁰ Many US listed Chinese firms adopt a

⁹ Jegadeesh, Weinstein, and Welch (1993) find that their results in IPO underpricing are consistent with the view that the market is better informed than the seller and the underwriter.

¹⁰ It is believed that firms that go public through the IPO process are more thoroughly vetted than firms

VIE structure, because they could not get permission to list overseas from the Chinese government and foreign companies are restricted from investing or operating in certain industries in China. There are many regulatory and operational risks facing US shareholders investing in these firms, since the listed firms control their Chinese operations through contracts. We employ an indicator variable, *VIE*, 1 if a firm relies on contracts to control its operations in China and zero otherwise. Given the differences in corporate control, we expect the IPO and VIE structures to exhibit different risk characteristics.

We examine firm fundamental characteristics using financial statement and market valuation disclosures in the listing year. The first variable is *Size*, measured as natural logarithm of total assets. *Age* is the number of years since the firm's founding date. It is generally believed that firms with substantial debt or loans face greater monitoring from creditors. We analyze *Leverage*, defined as total liabilities divided by total assets. We measure profitability with return on assets (*ROA*), defined as net income divided by beginning total assets (Loughran and Ritter, 1995). Return on equity (*ROE*) is calculated as net income as a percentage of beginning common equity. We also construct an indicator variable for *Loss*, equal to 1 if a firm reports a loss, and zero otherwise. Since growth opportunities are an important element of firm valuation, we measure *Growth* with sales growth, defined as the percentage change in sales year over year. We capture the importance of cash flow differences for valuation by measuring *CFO* as net operating cash flows divided by total assets. We also analyze two stock market measures: book-to-market ratio (*BM*) calculated by book value of common equity divided by market capitalization of common stocks at the end of fiscal

that enter the US market through the reverse merger process. Furthermore, the vast majority of reverse merger firms are listed in the Pink Sheets or the NASDAQ bulletin Board. Given differences in listing requirements for NASDAQ bulletin board and the Pink Sheets, one would expect these firms to be higher risk than firms listed on the main exchanges.

year, and Earnings before interest and tax deflated by stock price at the end of fiscal year (*EBIT/Price*).

Prior literature suggests that accruals are an important predictor of firms with aggressive financial reporting and earnings quality (Dechow et al., 2010). We examine *Accruals*, defined as total accruals divided by total assets. We measure total accruals directly from the statement of cash flows as net operating income before extraordinary items minus cash flow from continuing operations (Hribar and Collins 2002).

Audit quality may impact investors' perceptions of Chinese firms' financial reporting quality. We construct an indicator variable for auditor reputation (*Big4*), equal to 1 if a firm hires a "Big4" auditor and zero otherwise. We also measure audit quality with an indicator variable, *Opinion* defined as 1 if a firm receives an audit opinion other than a standard unqualified opinion and zero otherwise.

Institutional investors are regarded as active monitors of managers (e.g., Bushee 1998, Hartzell and Starks, 2003). We examine whether institutional investors have better ability to differentiate between "good" and "bad" Chinese firms that list in the US. Our measure of institutional ownership is TIO, which is calculated as the number of stocks owned by institutional investors divided by the firm's total outstanding shares at the end of the quarter in which a firm is initially listed.¹¹

C.2. Information Asymmetry between Investors and Entrepreneurs

Our first evidence showing that investors cannot separate "bad" firms from "good" firms is from the time series analysis of market returns. To the extent that investors can use publicly available information to infer a "good" or "bad" firm, market prices would properly reflect the risk associated with either type of investment. Panel B of Table 5 compares the stock returns of "bad" and "good" firms based on

¹¹ Variable definitions can be found in Appendix 3. We winsorize all continuous variables at the 1st and 99th percentiles.

three different approaches. Clearly, “good” firms and “bad” firms have similar negative returns. It is surprising that firms without SEC litigation have worse returns than firms with SEC litigation in 2011-2012.

Our second evidence supporting the notion that investors may not be able to distinguish firm types is from firm characteristics. We do not have an ex ante directional prediction but we expect that “bad” firms would surely be penalized and may not be able to attract capital in a well-functioning capital market. Thus, “bad” firms would have strong incentives to mimic the corporate control structures, financial disclosures, and all other aspects of the “good” firms in hopes of being pooled with the “good” firms. We estimate probit regressions to determine whether the fundamental characteristics in listing year are jointly significant in predicting fraud charges.

Our dependent variables are the three measures of fraud charges: *SEC*, *Action*, and *Media*. Following prior literature (e.g., Dechow, Sloan, and Sweeney 1996), our independent variables include size, leverage, performance measures (*ROA*, *Growth*, and *Loss*), book to market (*BM*), total accruals (*Accruals*), audit measures (*Big4* and *Opinion*), and an institutional measure (*TIO*). For the IPO sample, an investment bank reputation measure (*IB Rank*) is also included. Since IPO firms are almost surely different from reverse merger firms, we include an IPO dummy. We also analyze the impact of the *VIE* structure on fraud charges as firms with *VIE* structures. Finally, we control for listing year and industry dummies in the probit models. Table 6 provides the regression results. Columns (1)-(3) show that the IPO dummy is a consistent predictor of probability of fraud charges in the full sample. IPO firms are less likely to be charged by the SEC, the shareholders and the media for accounting frauds.

Leverage is negatively associated with all three measures of fraud charges, suggesting

that firms with higher leverage are less likely to face fraud accusations. Our results suggest that creditors may have a monitoring impact on Chinese firms listed in US. In addition, we find evidence that the SEC, shareholders, and the media concentrate their efforts on larger firms. Audit opinion other than standard unqualified opinion significantly increases the likelihood of SEC litigation or class action, especially for reverse merger firms. But hiring a prestigious auditor (Big4) has no impact on the likelihood of fraud charges, except that it is positively associated with the probability of SEC litigation against IPO firms. The results suggest that auditor identity does not play a major role in the decision by the SEC, lawyers, or reporters to pursue allegations of wrong doing in either IPOs or reverse mergers.

Even though the VIE structure may impose firm regulatory and accounting risks, firms with the VIE structure are not more likely to face *ex post* scrutiny. The coefficients on the VIE dummy are not statistically significant across all models. Similarly, our proxy for earnings quality (Accruals) is not significantly related to charges either. Neither does institutional ownership measure (TIO) or investment bank reputation (IB Rank). The multivariate analysis confirms the univariate test results that there are few consistent signals that investors can rely upon to detect accounting frauds in the US listed Chinese firms.¹²

(Insert Table 6 here)

One may argue that our classification of frauds are *ex post*, so we also use an *ex ante* measure, the degree of IPO underpricing, to examine whether the market is well informed or even better informed than entrepreneurs and underwriters as documented in Jegadeesh, Weinstein, and Welch (1993). The degree of IPO

¹² We analyzed the restated earnings from the Audit Analytics for 16 firms in our sample with earnings restatements later. Our results do not vary with either replacing earnings by restated earnings or exclude these firms from our analysis.

underpricing is calculated as the first day closing price minus offer price divided by offer price. Untabulated regression does show that the coefficient on “IB Rank” is positive and significant. It suggests that underpricing is less severe for the underwriters with high reputation, consistent with the conclusions in Beatty and Ritter (1986). However, during 2011 scandal period, the firms underwritten by reputable investment banks demonstrated more negative stock returns for the subsamples classified by fraud type. The evidence is consistent with the argument that investors do not know “Lemons” until they are revealed.

Our next set of tests address the question of Chinese entrepreneurs’ knowledge of their firm type. We examine whether “good” firms seek to exit the US market. Table 7 presents the comparison between privatized firms and other firms. We define “P” as the 25 firms that successfully privatized by the end of May 2013 and “NP” as the other 254 firms. Table 7 shows that none of successfully-privatized firms are under SEC litigation, compared to 8.3 percent of unsuccessful firms are facing litigation. Privatized firms are significantly less likely to be charged by the SEC or shareholders. We also find that privatized firms have lower probability of being a loss firm and higher profitability in listing year consistent with the privatization firms being “good” firms. On balance, there is relatively little evidence of any differences in other fundamental characteristics between privatized firms and other firms. Appendix 2 provides the list of successfully-privatized firms. We see that entrepreneurs are willing to pay a substantial premium to exit the market. On average, the premium, the difference between the offer price and the stock price at the announcement day, is 36.8%. These results are consistent with the assertion that “good” firms are exiting the US market by undertaking a costly going private transaction.

(Insert Table 7 here)

In sum, the evidence presented in this section suggests severe information asymmetry between investors and entrepreneurs. While investors cannot infer firm types and blindly react to “bad” and “good” firms, entrepreneurs appear to know their firm types.

C.3. Information Asymmetry: Additional Evidence from Institutional Investors

Institutional investors are generally viewed as most likely to be efficient producers of publicly available data. Institutional investors also have every incentive to privately search for information to aid in investment decision making. Thus, we investigate the propensity of institutional investors to invest in Chinese firms listed in the US. If institutional investors were capable of using publicly available or privately generate information to identify firms that subsequently were the subject of accounting irregularities, one would expect institutional investors to avoid investing in these problematic firms. If even institutional investors are unable to differentiate “good” from “bad” firms, it is likely that conditions for a “Lemons” market prevail. That is, there is a profound level of information asymmetry even among sophisticated investors.

We first use quarterly data to analyze how institutional holdings change after the firms listing dates. Table 8 compares institutional holdings of “bad” and “good” firms at the end of each quarter. From the first quarter to the fifth quarter, there is no significant difference in institutional holdings between firms charged by the SEC and other firms, regardless of full sample, IPO sample or RM sample. Firms subject to class actions have significantly higher institutional ownership than other firms from the fourth quarter to the fifth quarter after the listing date, and this result continues in the fifth quarter under our third classification of “bad” firms. Further analysis shows that the result is driven by reverse merger firms. Panel B of Table 10 indicates that

there is no significant difference in institutional holdings for the IPO sample. Importantly, we observe that institutional investors are “loading up” on these firms. They have been increasing their proportionate share to a greater degree in firms that ultimately became a problem. The fact that they are net buyers of these firms over time would be very inconsistent with their role as possessing superior information.

(Insert Table 8 here)

We further examine institutional trading around the IPO firm lockup expiration dates.¹³ If an institutional investor has private information about a fraud firm she owned prior to the IPO, we expect her to sell more immediately after the expiration of the lockup period. We compare the buy and sell order imbalance of institutional investors in the different windows around expiration of the lockup period.¹⁴ Order imbalance is the difference between buy and sell volume divided by the sum of these two. We find that institutional investors buy more stocks of firms classified as “bad” (SEC or class action), but sell more stocks of other firms after the lockup expiration. For instance, within the month of expiration date,, the order imbalance for other firms is -10.56% and that for the firms subject to SEC or class action is 21.32%. The difference is statistically significant. These findings are consistent with the quarterly trading results in Table 8, suggesting that institutional investors do not appear to have access to private information.

D. The Costs of Dishonesty

D.1. Spillover of Stock Returns

Akerlof (1970) emphasizes that the cost of dishonesty lies not only in the amount by which the purchaser is cheated but this cost must also include the loss

¹³ For this analysis, we focus on IPO sample only as their lockup expiration dates can be identified precisely.

¹⁴ Field and Hanka (2001) and Brav and Gompers (2003) find that stock prices fall in the week that lockup expires. We obtain institutional daily trading data for the period from January 2000 to December 2011 from Ancerno Inc., a private data provider.

incurred from driving legitimate business out of existence. In his automobile market model, misrepresentation of the quality of automobiles can eliminate the used car market. He also suggests that quality variation is greater in underdeveloped than in developed areas. For example, Indian housewives must carefully clean the rice of the local bazaar to sort out stones of the same color and shape which have been intentionally added to the rice. Thus, merchants who have the skills in identifying the quality of inputs and certifying the quality of outputs become important. We examine the costs of dishonesty related to Chinese firms listed in the US in this subsection and investigate the impact of dishonesty on the IPO market mechanism in the next subsection.

Driving good firms out from the US market is one cost of dishonesty. In the last section, we show that entrepreneurs are willing to pay 36.8% more than traded market price of these firms to privatize. This observation suggests that quality variation causes these firms to be traded at the price with nearly a 40% discount. We further examine the cost of dishonesty with a different approach, i.e., evaluating the costs to all firms when major negative events occur to some firms in the market.

In order to identify major negative events for our portfolio, we calculate the three-day abnormal return (CAR) for each trading date in 2010 and 2011. The CAR is the difference between the cumulative return for each stock and the value-weighted market returns. We then select the five dates with the most negative market adjusted CAR during the period of 2010-2011. We identify related news events by reading business news on Google Finance and Yahoo!Finance for the week surrounding each of these five dates. Panel A of Table 9 presents the three-day CAR for each date as well as the possible related news events within the week. On June 17, 2011 and June 2, 2011, Citron and Muddy Waters Research issued negative research reports on Harbin

Electric Inc. and Sino-Forest Corporation (a firm listed on Toronto Stock Exchange). The entire Chinese IPO firm portfolio sank by 6.07% and 5.37% around these dates, respectively. On the other three event dates (articles by Reuters and the Wall Street Journal), a few Chinese IPO firms are targeted and the portfolio returns drop by more than 5%. The histogram in Panel B of Table 9 shows that the majority of the US listed Chinese firms suffer from significantly negative returns when these events occurred. The two highest concentrations in the bins are category [-10%, -5%] and [-5%, 0%] returns, consisting of 263 and 329 firm-events, respectively. This evidence suggests that there is a substantial cost of dishonesty from spillover effects for stock returns.

(Insert Table 9 here)

D2. Behavior of Short Sellers

Short sellers asserted claims of Chinese firm financial frauds, but we haven't explored whether these whistle blowers are credible. We conduct two tests on short sellers' behaviors. First, we examine the informational role of short sales in the market for US listed Chinese firms. Prior literature on US firms shows that short sales can predict future returns (Desai, Ramesh, Thiagarajan 2002; Boehmer, Jones, and Zhang 2008; Diether, Lee, and Werner 2009), but no studies have considered short seller's returns on Chinese firms. Second, we examine whether the negative reports indeed provide fundamental information or whether the timing of issuance involves in any short seller's strategic behavior.

We obtain intra-day short sales transactions data from FINRA for the period from August 2009 to May 2012. We aggregate intraday transactions to obtain daily short sales for the Chinese firms listed in the US. For each firm, we sort all trading dates from 2009 to 2012 by daily short sales. We obtain dates with the bottom 10 and top 10 percent of short sales and calculate the cumulative raw returns in the month

following these dates. We find significantly negative returns (-2.00%) for the top short sales decile in 20 trading days following these dates. The cumulative raw returns for the bottom decile, 0.5%, is insignificantly different from zero. In addition, we identify the date with the highest level of daily short sales during 2009-2012, define this date as date zero, and then calculate the cumulative raw returns for the window [1, 20]. The computed returns are -7.5 percent. These test results suggest that US listed Chinese firm short sales occur prior to stock price declines and may indicate that short sellers have access to “bad” news..

To examine whether short sellers are involved in strategic behavior, we search Lexis-Nexis for short sellers’ research reports using keywords “strong sell”, “conviction sell”, “short”, “shorting”, “short seller”, “short position”, “short report”, “research report”, and “allegation.” We are able to identify 42 US listed Chinese firms with negative reports (see Appendix 3 for the complete list). The sample includes 41 firms with exact dates of negative reports and short sales data. In this subsample, ten firms subsequently had SEC litigation; among 31 firms without the SEC charge, 21 firms were subject to class action lawsuit, and 10 firms face neither the SEC charge nor class action. Treating the report date as date 0, we calculate the cumulated raw returns during the window of [-20, 20].¹⁵ Following Khan and Lu (2013), we calculate abnormal short sales as short sales minus the average short sales during [-60, -20], deflated by outstanding common shares.

Panel A of Figure 2 shows that short sales peak at the date of negative reports for the firms with the SEC charge and/or class action. Firms exhibit large negative returns on the report dates too. However, the returns start to decline several days before the peak of the short sales, so it is not clear whether short sellers provide the

¹⁵ The delisting returns is treated as -100%.

original information or simply react to the information which was being processed by the market. Panel B of Figure 2 suggests an inverse, but interesting pattern. Short sales increase sharply at three days before research report date and peak on date -1 for the firms without SEC litigation or class action subsequently. The returns have been increasing until day -2 and dropped around the time of the peak short sales. The evidence indicates that, for this group of firms, short sellers have built up their short positions several days before they issued their research reports, consistent with strategic behavior of short sellers.

(Insert Figure 2 here)

Untabulated results show that prices of the SEC charged firms dropped by 17.3 percent on the report date, and firms with class action but no SEC charges suffered 14.5 percent. However, firms without subsequent SEC litigation or class action lawsuit also had a negative return of 6.2 percent at the report date, although stock prices eventually recovered for some firms in this group. The results are again consistent with the findings in previous section that there is a spillover effect of negative short sellers' research reports.

E. Market Mechanisms

E1. Audit Quality and Underwriter Reputation

When quality uncertainty exists, counteracting institutions are expected to evolve to mitigate the effect of this uncertainty. Guarantees, agents with reputation capital, and licensing are a few popular mechanisms for overcoming informational asymmetry. In the US Chinese firm IPO market, auditor and underwriters may provide certification of firm quality. Auditors closely monitor the reliability of financial statements before and after the IPO, and highly reputable underwriters may screen "Lemons" out in their underwriting process. In this section, we examine

whether audit quality or underwriter reputation matters in the U.S. Chinese IPO firm market.

Panel A of Table 10 describes the number of IPO firms audited by each reputable accounting firm (Big-5 including Arthur Andersen), and the percentage of fraud firms. None of the firms audited by KPMG or Ernst & Young is subject to SEC litigation. When comparing the fraud rate between Big 5 and Non Big 5, we calculate the number-weighted average of fraud rate, i.e., the fraud rate is weighted by the number of firms audited by each accounting firm. Big 5 auditors have an average likelihood of 4.1 percent that their clients are subject to SEC litigation, while non-Big 5 auditors have 5.3 percent. The other two fraud classifications show the opposite that Big5 auditors have higher likelihood of fraud charges than non-Big5 auditors, but the differences are statistically insignificant. The evidence suggests that Big-5 firms do not provide better audit quality.

Panel B of Table 10 presents the evidence on how well underwriters provide certification to IPO firms. For each lead underwriter of IPO firms, we obtain prestige rankings from Jay Ritter's website, which is based on Loughran and Ritter (2004). Panel B shows the number of firms underwritten by prestigious investment banks with a score of 9 and the percentage of fraud firms in the IPO sample. Number-weighted average comparison shows that prestigious underwriters have a higher percentage of fraud firms than other underwriters. This is a surprising result, suggesting that the underwriter screening mechanism fails to identify “Lemons”.

(Insert Table 10 here)

E.2. Incentives for Manipulation

While the traditional market mechanisms (audit quality, underwriter's reputation) fail, we turn to the incentives for entrepreneurs manipulating financial information.

The first incentive is the potential costs associated with the misbehavior. If a Chinese firm listed in US has access to the US product market, it would face more scrutiny from US customers and US competitors. If misconduct is discovered, the potential cost is also high. We expect these firms are less likely to engage in accounting frauds because of possible *ex post* settling up costs. Based on Compustat segment data, we construct a dummy variable to proxy for product penetration in North America market (NA Sales). If there is any sales revenue from North America in the listing year or one year before or one year after, NA Sales is one and zero, otherwise. Our tests focus on IPO firms.

Columns (1)-(3) of Table 11 present regressions results. NA Sales is a new variable added to the regression similar to the one featured in Table 6. The coefficients on NA Sales are negative in all three probit regressions of fraud charges, suggesting that access to product markets in North America reduces the likelihood of accounting frauds in Chinese firms listed in US.

We further investigate whether CEO's US education is related to prevention of accounting frauds. From the CEO's biography, we identify CEO educational background and construct a dummy variable (USEducation), equal to "1" if the CEO received degree(s) from US institutions. Appendix 6 provides the list of US institutions in which CEOs received their degrees. Columns (4)-(6) of Table 11 indicates that CEO's US education significantly reduced the likelihood of accounting fraud in Chinese firms. Our interpretation of this result is twofold: First, business ethics are popularly taught in US higher education curriculum, so these CEOs may act with a higher standard of business integrity. Alternatively, these CEOs may have US residence status in the United States which they obtained after they finished their US degree. Such a status increases potential legal costs. Since we don't have data on the

permanent resident or citizenship information, we are not able to distinguish between these two possible explanations.

(Insert Table 11 here)

E.3. Effect of Regulations and Learning

In Section D1 and Table 10, we conclude that US investors responded to all Chinese firms when the five most negative events occurred. It would be interesting to know whether the “Lemons” problem is unique among the Chinese firms listed in the U.S. but not those listed in the domestic market in China. The answer may shed light on whether the regulations in China or the lack of regulations in the U.S. contributes to the emergence of the “Lemons” market.

First, we examine how Chinese investors responded to the revelation of the negative events in the U.S. and whether the spillover effect traveled across the Pacific Ocean. The Chinese market returns in days (-1,+1) associated with the five events in Table 11 are -1.18%, -1.86%, -0.82%, -1.62%, and -0.92%, respectively. They are all negative, and significant for two events (events 2 and 4). While Chinese investors did not respond significantly to the firm specific events such as the negative reports on Harbin Electric and Sino-Forest, they responded to other general events such as the announcement about the intention of regulating or cancelling the VIE structure. The evidence suggests that even Chinese investors were surprised by the magnitude of “Lemons” among Chinese firms listed in US and add a discount to the firms traded in China. The findings are preliminary but surprising considering on average 10% of the Chinese domestic IPOs were eventually involved in the litigations initiated by the CSRC due to accounting irregularities.

To strengthen the above argument, we further examine how Chinese investors responded to the 10 firms cross-listed in the US and China which are excluded in our

current sample. Our analysis shows that CAR (-1,+1) in US market associated with the five events are -1.19%, -2.75%, 1.22%, 0.13%, and -3.49%, respectively, suggesting that cross-listed firms are only affected by general events such as events 2 and 4. Meanwhile, CAR (-1,+1) in China market associated with the five events are -0.48%, 1.24%, -0.27%, 0.38%, and 0.44%, respectively. Again, the evidence is consistent with our argument that the “Lemons” market emerges under the circumstance of lack of effective regulations across country boundaries.

V. CONCLUDING REMARKS

Prior literature in economics largely studies information asymmetry in well-functioning markets. For a market in which information asymmetry is severe while information search has significant frictions, Akerlof (1970) predicts the possibility of a market failure. This outcome is rarely observed because diligent information search can mitigate information asymmetry and market mechanisms may prevent a market failure. However, we document an exception to the norm. A number of Chinese firms elected to enter the US capital market over last decade. Different governance structures, information environments and regulations impose significant challenges for US investors in collecting and processing information.

In 2012, with the revelation of the frauds of some US listed Chinese firms, the US listed Chinese firm market suffered significant losses. We hypothesize and test whether a classic “lemons” market occurred. Our tests reveal the existence of severe information asymmetry between investors and entrepreneurs and a resulting market collapse. We find little evidence that traditional market mechanisms such as short selling behavior, auditor quality and underwriter reputation provide credible signals of firm quality. We further find that factors capturing potential *ex post* settling up costs

such as North America sales and CEO's US education are less likely associated with financial frauds.

The findings provide significant implications to Chinese and U.S regulators. Both regulators have great concerns about the Lemons market (Aguilar, 2011). China does not regulate Chinese firms listed in the US. While US regulators paid little attention to the difficulties of regulating cross-boundary IPOs in the past, China also did not allow US regulators to come into China to monitor auditing firm operating activities, citing concerns of national sovereignty as the motivation. Both sides realized the significance of information sharing and signed the first Memorandum of Understanding (MOU) which opens the door for U.S. regulators to access documents held by Chinese auditors in May 2013. Learning from the problems exposed in the 2012 "Lemons" market, the China Securities Regulatory Commission (CSRC) halted its domestic IPO approval process since September 2012. CSRC is investing significant efforts in sampling IPO applications and examining the reliability of the firms' financial information.

Akerlof (1970) suggested that the consequence of quality uncertainty vary with the state of market development. Despite the substantial growth in information economics literature, we continue to benefit from the insights that we first learned forty three years ago.

REFERENCES

- Allen, F., and G. Faulhaber, 1989. Signaling by Underpricing in the IPO Market, *Journal of Financial Economics* 23: 303-323.
- Allen, F., J. Qian, and M. Qian. 2005. Law, finance, and economic growth in China, *Journal of Financial Economics* 77, 57-116.
- Allen, F., J. Qian, C. Zhang, and M. Zhao. 2013. China's Financial System: opportunities and Challenges, in the book "Capitalizing China," edited by J. P. H. Fan and R. Morck, the University of Chicago Press.
- Adjei, F., K. B. Cyree, and M. M. Walker. 2008. The Determinants and Survival of Reverse Mergers versus IPOs. *Journal of Economics and Finance* 32 (2): 176-194.
- Aguilar, L. 2011. U.S. Securities and Exchange Commission. "Speech by SEC Commissioner: Facilitating Real Capital Formation"
<http://www.sec.gov/news/speech/2011/spch040411aa.htm>.
- Akerlof, George A. 1970. The Market for 'Lemons': Quality, Uncertainty and the Market Mechanism. *Quarterly Journal of Economics* 84 (3): 488-500.
- Beatty, R., and J. Ritter, 1986. Investment Banking, Reputation, and the Underpricing of Initial Public Offerings. *Journal of Financial Economics* 15: 213-232.
- Black, B., and R. Gilson, 1998. Venture Capital and the Structure of Capital Markets: Banks versus Stock Markets, *Journal of Financial Economics* 47: 243-277.
- Boehmer, Ekkehart, Charles M. Jones, and Xiaoyan Zhang, 2008. Which Shorts Are Informed? *Journal of Finance* 63 (2): 491-527.
- Brav, A., and P. Gompers, 2003. Insider Trading Subsequent to Initial Public Offerings: Evidence from Expirations of Lockup Provisions. *Review of Financial Studies* 16:1-29.
- Bushee, Brian, 1998. The Influence of Institutional Investors on Myopic R&D Investment Behavior. *The Accounting Review* 73: 305-333.
- Chao, L., and A. Efrati, 2011. Yahoo's China Feud Turns Ugly, Stock Falls. *The Wall Street Journal* May 14, 2011.
- Chemmanur, T., and P. Fulghieri 1999. A Theory of the Going Public Decision. *Review of Financial Studies* 12: 249-279.
- Chen, Kun-Chih, Qiang Cheng, Ying Chou Lin, Yu-Chen Lin, and Xing Xiao. 2012. Does Foreign Firms' Shortcut to Wall Street Cut Short Their Financial Reporting Quality? Evidence from Chinese Reverse Mergers. Working Paper, Singapore Management University. <http://ssrn.com/abstract=2043899>
- China Securities Regulatory Commission (CSRC), 1999. Announcement No. 83: Notice on Relevant Issues concerning Enterprises' Application for Overseas Listing.
- China Securities Regulatory Commission (CSRC), 2006. Decree No. 32: Measures for the Administration of Initial Public Offering and Listing of Stocks.

- China Securities Regulatory Commission (CSRC), 2009. Decree No. 61: Interim Measures on Administration of Initial Public Offering and Listing on Growth Enterprise Board.
- China Securities Regulatory Commission (CSRC), 2012. Announcement No. 45: Guidelines for Supervising the Application Documents and Examination Procedures for the Overseas Stock Issuance and Listing of Joint Stock Companies.
- Darrough, Masako, Rong Huang, and Sha Zhao, 2013. The Spillover Effect of Disclosures on Alleged Frauds by Chinese Reverse Mergers. Working paper, City University of New York. <http://ssrn.com/abstract=2144483>
- Dechow Patricia, Richard Sloan, Amy Sweeney, 1996. Causes and Consequences of Earnings Manipulation: An Analysis of Firms Subject to Enforcement Actions by the SEC. *Contemporary Accounting Research* 13: 1-36.
- Dechow Patricia, Weili Ge, and Catherine Schrand, 2010. Understanding Earnings Quality: A Review of the Proxies, Their Determinants and Their Consequences. *Journal of Accounting and Economics*, 50: 344-401.
- Diether, Karl, Kuan-Hui Lee, and Ingrid Werner. 2009. Short-sale strategies and return predictability. *Review of Financial Studies* 22 (2): 575–607.
- Desai, Hemang, K. Ramesh, S. Ramu Thiagarajan, and Bala Balachandran. 2002. An Investigation of the Informational Role of Short Interest in the NASDAQ Market. *Journal of Finance* 57 (5): 2263–2287.
- Doidge, Craig, G. Andrew Karolyi, and Rene Stulz. 2004. Why are foreign firms listed in the U.S. worth more? *Journal of Financial Economics* 71 (2): 205-238.
- Field, L.C., and G. Hanka, 2001. The Expiration of IPO Share Lock-ups. *Journal of Finance* 56: 471-500.
- Givoly, D., C. Hayn, and B. Lourie. 2012. Importing Accounting Quality: The Case of Foreign Reverse Mergers. Working paper, Penn State University. <http://ssrn.com/abstract=2183724>
- Gomes, Armando, and Gordon Phillips, 2012. Why Do Public Firms Issue Private and Public Securities? *Journal of Financial Intermediation* 21: 619-658.
- Grinblatt, M., and C.Y. Hwang, 1989. Signaling and the Pricing of New Issues, *Journal of Finance* 44: 393-420.
- Hartzell, J. C., and L.T. Starks, 2003, Institutional Investors and Executive Compensation, *Journal of Finance* 58: 2351-2374.
- He, X., T. J. Wong, and D. Young. 2013. US Listing of Chinese Firms: Bonding vs. Adverse Selection. Working paper, Chinese University of Hong Kong.
- Hribar, P., and D. W. Collins, 2002. Errors in Estimating Accruals: Implications for Empirical Research, *Journal of Accounting Research*, 40 (1): 105-134.
- Hung, M., T.J. Wong, and T. Zhang. 2012. Political Considerations in the Decision of Chinese SOEs to List in Hong Kong. *Journal of Accounting & Economics* 53: 435-449.

- Jegadeesh, N., M. Weinstein, and I. Welch, 1993. An Empirical Investigation of IPO Returns and Subsequent Equity Offerings. *Journal of Financial Economics* 34: 153-175.
- Khan, Mozaffar, and Hai Lu, 2013. Do Short Sellers Front-run Insider Sales?, *The Accounting Review*, 88 (5): 1743-1768.
- Lee, Charles, Kevin Li, and Ran Zhang. 2013. Shell games: Are Chinese reverse merger firms inherently toxic? Working paper, Stanford University. <http://ssrn.com/abstract=2155425>.
- Lerner, J. 1994. Venture Capitalists and the Decision to Go Public, *Journal of Financial Economics* 35: 293-316.
- Loughran, T., and J. R. Ritter. 1995. The new issues puzzle. *The Journal of Finance* 50 (1): 23-51.
- Loughran, T., and J. R. Ritter. 2004. Why Has IPO Underpricing Changed Over Time? *Financial Management*, 33 (3): 5-37.
- National Development and Reform Commission and Ministry of Commerce 2004. Catalogue of Industries for Guiding Foreign Investment, China.
- National Development and Reform Commission and Ministry of Commerce 2007. Catalogue of Industries for Guiding Foreign Investment, China.
- National Development and Reform Commission and Ministry of Commerce 2011. Catalogue of Industries for Guiding Foreign Investment, China.
- Myers, S., and N. Majluf. 1984. Corporate Financing and Investment Decisions When Firms Have Information That Investors Do Not Have. *Journal of Financial Economics* 13: 187-221.
- Pagano, M., F. Panetta and L. Zingales, 1998. Why Do Firms Go Public? An Empirical Analysis. *Journal of Finance* 53: 27-64.
- Pollard, Troy, Sneaking in the Back Door? An Evaluation of Reverse Mergers and IPOs. Working paper, University of Alabama.
- Riley, John, 2001. Silver Signals: Twenty-Five Years of Screening and Signaling. *Journal of Economic Literature* 39: 432-478.
- Stiglitz, Joseph, 2000. The Contributions of the Economics of Information to Twentieth Century Economics. *Quarterly Journal of Economics*, 115 (4): 1441-1478.
- Welch, I., 1989 . Seasoned offerings, Imitation Costs and the Underpricing of Initial Public Offerings, *Journal of Finance* 44: 421-449.
- Zingales, L. 1995. Insider Ownership and the Decision to Go Public. *Review of Economic Studies* 62: 425-448.

Appendix 1
Variable Definition

Accruals	Total accruals divided by ending total assets in listing year
Action	Dummy variable, 1 if a firm faces either SEC litigation or class action regarding accounting issues during 2000-2012
Age	Number of years that a firm was established by the time of its listing, natural log is used in regressions
Big4	Dummy variable, 1 if a firm hires a “Big4” as its auditor in listing year, otherwise 0
BM	Book-to-market ratio in listing year, calculated by book value of common shareholder’s equity divided by market capitalization of common stocks at the end of fiscal year
CFO	Net operating cash flows divided by ending total assets in listing year
Charge	Dummy variable, 1 if a firm faces any charge from SEC or shareholder during 2000-2012 or media during 2009-2012
EBIT/Price	Earnings before interest and tax deflated by stock price at the end of fiscal year
Growth	Sales growth in listing year, defined as the percentage change in sales from the lag year to the current year
IB Rank	Rankings of lead underwriters, use average rankings if there is more than one lead underwriter; prestige rankings are obtained from Jay Ritter’s website
IPO	Dummy variable, 1 if a firm is listed through regular IPO process, otherwise 0
Leverage	Total liabilities divided by ending total assets in listing year
Loss	Dummy variable, 1 if a firm has negative net income, otherwise 0
Opinion	Dummy variable, 1 if a firm gets audit opinion other than standard unqualified opinion in listing year, otherwise 0
NA Sales	Dummy variable, 1 if there is any sales from North America around listing year (1 year before and 1 year after), otherwise zero
Proceeds	Offering price multiplied by shares offered during the IPO, in \$million
ROA	Return on assets in listing year, calculated by net income deflated by ending total assets
ROE	Return on equity in listing year, calculated by net income deflated by ending common shareholder's equity
SEC	Dummy variable, 1 if a firm faces any SEC litigation regarding accounting issues during 2000-2012
Size	Natural log of total assets in listing year
TIO	Ownership by institutional investors at the end of the quarter in which a firm gets listed, deflated by outstanding common shares
USEducation	Dummy variable, 1 if CEO studied in US universities and institutions, otherwise zero
VIE	Dummy variable, 1 if a firm uses variable interest entities for its operations in China, otherwise 0

Appendix 2

List of the Privatized Firms

We identify twenty five firms that announced privatization plan by December 31, 2012 and were successfully privatized by May 31, 2013. Premium is the difference between offer price in privatization plan and stock price one day before the announcement date, deflated by the stock price. IPO indicates that a firm listed through regular IPO process; RM indicates that a firm listed through reverse merger.

Firm Name	Type	Announcement Date	Effective Date	Premium
Tongjitang Chinese Medicines	IPO	2010/4/8	2011/4/15	19.1%
Harbin Electric	RM	2010/10/11	2011/11/3	20.2%
Bmp Sunstone Corp	RM	2010/10/28	2011/2/24	30.6%
Fushi Copperweld Inc	RM	2010/11/3	2012/12/12	4.4%
Chemspec International	IPO	2010/11/11	2011/8/19	26.6%
China Security & Surveillance Tech	RM	2011/1/31	2011/9/16	30.8%
China Fire & Security Group	RM	2011/3/7	2011/11/4	43.8%
Funtalk China	RM	2011/3/25	2011/8/25	15.5%
Tiens Biotech Group	RM	2011/6/27	2011/8/11	68.6%
Shanda Interactive	IPO	2011/10/17	2012/2/14	23.5%
China Real Estate Information	IPO	2011/10/28	2012/4/23	48.2%
China Grentech Corp Ltd	IPO	2011/11/14	2012/4/17	21.1%
Global Education & Tech Group	IPO	2011/11/21	2011/12/21	108.0%
Jingwei International Ltd	RM	2012/1/6	2012/3/30	16.4%
Pansoft Co Ltd	IPO	2012/1/7	2012/9/28	91.8%
China Transinfo Technology	RM	2012/2/21	2012/10/30	9.7%
Gushan Environmental Energy	IPO	2012/2/24	2012/10/15	30.0%
Winner Medical Group Inc	RM	2012/4/2	2012/12/7	26.5%
China Mass Media Corp	IPO	2012/5/4	2012/8/8	100.0%
Yucheng Technologies Ltd	RM	2012/5/21	2012/12/27	26.6%
China Nuokang Bio-Pharma	IPO	2012/5/9	2013/2/6	56.8%
Shangpharma Corp	IPO	2012/7/6	2013/3/28	30.8%
Focus Media Holding Ltd	IPO	2012/8/13	2013/5/24	15.5%
Syswin Inc	IPO	2012/9/7	2013/4/9	25.0%
3sbio Inc	IPO	2012/9/12	2013/5/24	29.4%

Appendix 3. List of 42 Firms with Negative Reports from Short Sellers

We identify 42 US listed Chinese firms with negative reports from short sellers, by searching Lexis-Nexis on keywords such as “strong sell”, “conviction sell”, “short”, “shorting”, “short seller”, “short position”, “short report”, “research report”, “allegation”, and variations of “allegation”.

Name	Date	Report Source	SEC	Non-SEC Action
Origin Agritech Ltd	2009/11/25	Citron Research	0	0
China Natural Gas	2010/2/12	Alfred Little	1	0
Orient Paper	2010/6/28	Muddy waters	0	1
China Biotics	2010/8/30	Citron Research	1	0
China Green Agriculture	2010/8/31	Alfred Little	0	1
China New Borun Corp	2010/10/12	Citron Research	0	0
Rino International	2010/11/10	Muddy waters	1	0
China Education Alliance Inc	2010/11/29	Kerrisdale Capital	0	1
Cninsure Inc	2010/12/2	OLP Global	0	1
China Valve Technology	2011/1/13	Citron Research	0	1
Telestone Technologies Corp	2011/1/14	The Forensic Factor	0	0
China Mediaexpress Holdings ^a	2011/1/26	Citron Research	1	0
Autochina International	2011/2/1	The Forensic Factor	1	0
China Agritech	2011/2/3	LM Research	0	1
China ShenZhou Mining& Resources	2011/3/8	Absaroka Capital Mgmt	0	0
Universal Travel Group	2011/3/8	Glaucus Research Group	0	1
Deer Consumer Products	2011/3/10	Alfred Little	0	1
China Integrated Energy	2011/3/28	Alfred Little	0	1
Advanced Battery Technologies Inc	2011/3/30	Variant View Research	0	1
Duoyuan Global Water	2011/4/4	Muddy waters	0	1
Puda Coal	2011/4/8	Alfred Little	1	0
China North East Petro Hldg	2011/4/13	Bigfish Research	1	0
Zst Digital Networks Inc	2011/4/21	Seeking Alpha	0	1
Gulf Resources Inc	2011/4/26	Glaucus Research Group	0	1
Longtop Financial	2011/4/26	Citron Research	1	0
Sino Clean Energy	2011/4/28	Alfred Little	0	1
Sky-Mobi Ltd	2011/5/3	Citron Research	0	0
Sina Corp	2011/5/20	Zacks	0	0
Harbin Electric	2011/6/1	Citron Research	0	0
Yuhe International	2011/6/13	Geoinvesting	0	1
A-Power Energy Generation Systems	2011/6/17	Seeking Alpha	1	0
Lihua International	2011/8/1	Absaroka Capital Mgmt	0	0
L & L Energy Inc	2011/8/2	Glaucus Research Group	0	1
Camelot Information Systems Inc	2011/8/15	Seeking Alpha	0	1
Sinotech Energy	2011/8/16	Alfred Little	1	0
Zhongpin	2011/8/18	Alfred Little	1	0
Sinocoking Coal & Coke Chem	2011/9/20	Alfred Little	0	0
Qihoo 360 Technolgy Co	2011/11/1	Citron Research	0	0
New Oriental Education & Tech	2011/11/17	OLP Global	0	1
Focus Media Holding	2011/11/21	Muddy waters	0	1
China Medical Technologies	2011/12/6	Glaucus Research Group	0	1
Fushi Copperweld Inc	2012/4/11	Muddy waters	0	1

a. No data on short sales.

Appendix 4**US Institutions from which CEOs of US listed Chinese Firms Received Their Degrees**

Schools	N	SEC	Action	Charge
Bowie State University	1	0	1	1
Concordia College(US)	1	0	0	0
Fordham University	1	0	0	0
Georgia Institute of Technology	1	0	0	0
Harvard Business School	1	0	0	0
Iowa State University	1	0	0	0
Johns Hopkins University	1	0	0	1
New York University	1	0	0	0
Oregon State University	1	0	0	0
Princeton University	1	0	0	0
Rice University	1	0	0	0
Southern Methodist University	1	0	0	0
the State University of New York at Buffalo	1	0	0	1
the State University of New York at Stony Brook	1	0	0	0
the University of California, Santa Barbara	1	0	0	0
the University of Chicago	1	0	0	0
University of Arizona	1	0	0	0
University of Maryland	1	0	0	0
Washington University in St. Louis	1	0	0	0
Webster University in Missouri	1	0	0	0
the Massachusetts Institute of Technology	2	0	0	1
the University of California at Los Angeles	2	0	0	1
University of Minnesota	2	1	2	2
Columbia University	3	0	0	0
the University of California at Berkeley	3	1	2	2
the University of Pennsylvania	3	1	1	1
Stanford University	4	0	1	3

Table 1
Sample Selection and Characteristics

IPO firms are listed through regular IPO process; reverse merger firms are listed through reverse merger.

Panel A: US-listed Chinese firms by December 31, 2011	
US listed Chinese Firms in WIND & CV Source	312
More Firms in Compustat	4
Initial Sample Firms	316
Exclude:	
a. Cross-listing firms	19
b. Non-Chinese Firms	4
c. Firms from Hong Kong, Macau, and Taiwan	9
d. Funds	2
e. Special Purpose Acquisition Companies (SPACs)	3
Final Sample	279

Panel B: Sample composition			
	VIE Structure	Non-VIE Structure	Total
IPOs	83	57	140
Reverse mergers	32	107	139
Total	115	165	279

Panel C. Market capitalization on listing date (\$billion)		
IPO firms	113.52	83.16%
Reverse Merger Firms	23.00	16.84%
All firms	136.52	100.00%

Panel D. Fraud Charges			
	Reverse mergers	IPOs	Total
1. SEC Litigation (2000-2012)	15	6	21
2. Either Class Action or SEC Action(2000-2012)	50	32	82
3. SEC litigation, Class Action or Media Accusation	65	54	119

Table 2**Distribution of Sample Firms in Three Different Markets**

Panel A shows year distribution of sample Chinese IPO and reverse merger firms in US market. Panel B presents the number and proceeds of Chinese IPOs in three different markets. US IPOs and Hong Kong IPOs data are obtained from Securities Data Corporation (SDC) Global New Issues database. IPOs in China are obtained from WIND dataset. We exclude IPOs with an offer price of less than \$1, Unit offerings, Real Estate Investment Trusts (REITs) offerings, funds, and cross-listing offerings. Proceeds are in \$billions.

Panel A.

Year	IPO Firms	Revere Merger Firms	All Firms	%
1994	1	0	1	0.36
1998	1	0	1	0.36
1999	2	0	2	0.72
2000	6	1	7	2.51
2001	0	1	1	0.36
2002	0	1	1	0.36
2003	1	0	1	0.36
2004	10	3	13	4.66
2005	9	7	16	5.73
2006	10	6	16	5.73
2007	30	19	49	17.56
2008	6	21	27	9.68
2009	12	46	58	20.79
2010	40	31	71	25.45
2011	12	3	15	5.38
Total	140	139	279	100

Panel B.

Year	Listed in China			Listed in US			Listed Hong Kong		
	N	Proceeds	N	Proceeds	% of IPO proceeds	N	Proceeds	% of IPO proceeds	
2002	71	6.25	0	0	0	15	0.23	11.9	
2003	66	5.48	1	0.08	0.7	17	1.17	66.9	
2004	98	4.27	10	2.65	7.0	28	1.73	65.0	
2005	15	0.71	9	1.74	5.4	23	2.77	60.5	
2006	71	21.04	10	2.15	5.3	23	3.72	84.0	
2007	121	61.19	30	8.28	17.7	35	9.14	59.2	
2008	77	15.13	6	0.3	1.2	16	0.5	29.2	
2009	111	29.62	12	1.94	12.7	37	3.58	45.5	
2010	347	74.19	40	4.19	10.9	45	2.15	9.40	
2011	277	43.07	10	1.86	5.3	65	4.89	38.7	
2012	150	15.83	2	0.15	0.4	61	5.32	94.8	

Table 3
Descriptive Statistics in Listing Year

See Appendix 3 for variable definition. Continuous variables are winsorized at the 1st and 99th percentiles.

Panel A: Full sample					
Variable	Mean	Std. Dev.	Q1	Median	Q3
IPO	0.502	0.501	0	1	1
VIE	0.412	0.493	0	0	1
Age	8.079	4.323	5	7.25	10.58
Size	18.77	0.98	18.22	18.76	19.40
ROA	0.071	0.204	0.046	0.095	0.148
ROE	0.094	0.349	0.061	0.145	0.231
Leverage	0.29	0.194	0.125	0.243	0.426
CFO	0.059	0.15	-0.022	0.069	0.139
Accruals	0.016	0.179	-0.049	0.016	0.1
Growth	0.959	1.412	0.293	0.536	1.038
BM	0.512	0.479	0.21	0.367	0.639
EBIT/Price	0.086	0.129	0.021	0.057	0.143
Loss	0.144	0.352	0	0	0
Big4	0.48	0.501	0	0	1
Opinion	0.159	0.366	0	0	0
TIO	0.066	0.102	0	0.022	0.093

Panel B: IPO sample					
Variable	Mean	Std. Dev.	Q1	Median	Q3
VIE	0.593	0.493	0	1	1
Age	6.532	3.374	3.917	5.958	8.912
Size	19.19	0.979	18.79	19.22	19.66
ROA	0.067	0.142	0.043	0.077	0.114
ROE	0.097	0.201	0.055	0.098	0.166
Leverage	0.24	0.162	0.116	0.194	0.319
CFO	0.06	0.144	-0.002	0.071	0.136
Accruals	0.007	0.153	-0.056	-0.005	0.058
Growth	1.025	1.151	0.376	0.613	1.161
BM	0.467	0.421	0.193	0.354	0.576
EBIT/Price	0.058	0.111	0.015	0.03	0.069
Loss	0.138	0.346	0	0	0
Big4	0.855	0.353	1	1	1
Opinion	0.138	0.346	0	0	0
TIO	0.068	0.104	0	0.030	0.099

Table 4**Comparison between US-listed Chinese Firms and Other US Firms**

The table compares the survival rate of Chinese firms listed in US and other newly listed US firms within three years following IPOs. We identify newly listed firms in US in each year using CRSP data. Panel A compares firm characteristics between Chinese IPO firms and other US firms in the listing year. Panel B describes trading status of Chinese firms listed in US and other US listed firms in the years following the listing. A firm is considered as “active” (“failed”) if it has a delisting code of 100 (400 and 599) in CRSP. The firms disappearing from CRSP for other reasons such as M&A are not included in the statistical analysis. Variable definition is provided in Appendix 3. *, **, *** indicate significance levels of 10%, 5%, and 1% respectively.

Panel A. Firm characteristics in the listing year						
	Chinese Firms		US Firms		T-test	χ^2 test
	Mean	Median	Mean	Median	Mean	Median
Assets (Millions)	340.9	217.8	1739.1	123.3	-6.36***	41.75***
ROA	0.067	0.077	-0.136	-0.0003	15.24***	75.76***
Loss	0.138	0	0.506	1	-12.24***	73.62***
Leverage	0.240	0.194	0.412	0.353	-11.24***	44.00***
CFO	0.060	0.071	-0.061	0.01	8.89***	22.45***
Accruals	0.007	-0.005	-0.08	-0.046	6.80***	16.39***
Big4	0.855	1	0.793	1	1.80*	1.61
Opinion	0.138	0	0.256	0	-3.98***	10.17***
Growth	1.025	0.613	1.585	0.381	-4.76***	29.63***
BM	0.467	0.354	0.454	0.316	0.41	0.37
EBIT/Price	0.058	0.030	-0.025	0.010	8.18***	46.41***

Panel B. Percentage of active (failed) firms at the end of each year after listing			
	Year 1	Year 2	Year 3
	Active (Failed)	Active (Failed)	Active (Failed)
	%	%	%
US Firms	97 (3)	86 (7)	74 (13)
Chinese Firms	96 (4)	88 (10)	78 (19)
a. IPO	98 (2)	95 (3)	89 (5)
b. RM	94 (6)	82 (17)	68 (30)

Table 5**Market Performance of Chinese Firms Listed in US**

Panel A shows stock returns, turnover, and change in IPO proceeds for Chinese firms listed in NYSE, AMEX, and NASDAQ. Market adjusted CAR is the difference between the cumulative return of each stock and the equal-weighted market returns. The portfolio rebalances when a firm is added or dropped from the sample. Turnover is the average of each stock's turnover which equals to daily trading volume divided by shares outstanding. Panel B compares the stock returns of "bad" and "good" firms in 2009-2012. We use three approaches to classify "bad" firms: (1) firms are subject to the SEC litigation (SEC) during 2000-2012; (2) firms are subject to class action or SEC litigation (Action) during 2000-2012; (3) firms are accused by the SEC or shareholders or major U.S. media (Charge) during 2009-2012.

Panel A. Time series of the performance of Chinese portfolio

Year	# Stocks by Year end	Raw CAR	Market adj. CAR	Turnover	IPO proceeds (\$Billion)
2004	38	0.3693	0.1593	0.0360	2.6510
2005	55	-0.0893	-0.1594	0.0263	1.7440
2006	68	0.4178	0.2432	0.0244	2.1494
2007	118	0.2287	0.2596	0.0310	8.2846
2008	142	-0.5786	-0.2347	0.0189	0.3040
2009	191	0.9315	0.2297	0.0147	1.9410
2010	253	-0.0051	-0.2651	0.0135	4.1940
2011	221	-0.5381	-0.4629	0.0138	1.8590
2012	186	0.0176	-0.1856	0.0095	0.1500

Panel B. Market adjusted CAR for different subsamples of Chinese firms in 2009-2012

Year	Listing type		Classification 1		Classification 2		Classification 3	
	IPO	RM	Non-SEC	SEC	Non--Action	Action	No Charge	Charge
2009	0.0678	0.3651	0.2262	0.2697	0.2446	0.1985	0.1587	0.3201
2010	-0.1881	-0.3427	-0.2701	-0.1961	-0.2524	-0.2952	-0.3205	-0.1857
2011	-0.3777	-0.5823	-0.4666	-0.3491	-0.4598	-0.4738	-0.4636	-0.4616
2012	-0.1429	-0.2548	-0.1873	-0.1256	-0.1776	-0.2188	-0.1524	-0.2503

Table 6**Regression of Fraud Charges on Different Signals**

The table presents regression results on firm characteristics for three measures of fraud charges: *SEC* - an indicator variable, “1” if a firm faces any SEC litigation regarding accounting issues during 2000-2012, “0” otherwise; *Action* - an indicator variable, “1” if faces any SEC litigation or class action regarding accounting issues during 2000-2012, “0” otherwise; *Charge* - an indicator variable, “1” if a firm faces any charge from SEC or shareholder during 2000-2012 or media during 2009-2012, “0” otherwise. See Appendix 3 for definition of other variables. All continuous variables are winsorized at the 1st and 99th percentile. Columns (1)-(3) use full sample, columns (4)-(6) use subsample of IPO firms, and columns (7)-(9) use subsample of reverse merger firms. Robust z-statistics are reported in parentheses. *, **, *** indicate significance levels of 10%, 5%, and 1% respectively.

	Full Sample			IPO			Reverse Merger		
	SEC (1)	Action (2)	Charge (3)	SEC (4)	Action (5)	Charge (6)	SEC (7)	Action (8)	Charge (9)
IPO	-1.777*** (-3.00)	-0.814** (-2.57)	-0.496* (-1.81)						
VIE	-0.035 (-0.10)	-0.283 (-1.38)	-0.066 (-0.37)	-0.183 (-0.38)	-0.302 (-1.05)	-0.040 (-0.15)	0.160 (0.43)	-0.407 (-1.37)	-0.329 (-1.17)
Size	0.500** (2.22)	0.385*** (2.75)	0.247** (2.09)	0.392 (1.18)	0.368* (1.72)	0.315 (1.59)	0.437 (1.64)	0.470** (2.14)	0.151 (0.78)
Leverage	-1.962*** (-2.62)	-2.372*** (-3.98)	-1.729*** (-3.39)	-2.894** (-2.40)	-1.809* (-1.77)	-1.483 (-1.57)	-1.882** (-2.36)	-3.394*** (-3.96)	-2.381*** (-3.35)
ROA	-0.599 (-0.58)	-0.053 (-0.08)	0.328 (0.53)	-2.966* (-1.94)	-0.493 (-0.39)	0.037 (0.04)	-1.913 (-1.63)	-0.850 (-0.88)	-0.355 (-0.41)
Growth	0.160* (1.94)	0.034 (0.51)	0.045 (0.70)	-0.045 (-0.27)	-0.045 (-0.36)	0.009 (0.08)	0.176* (1.74)	0.072 (0.82)	0.039 (0.49)
BM	-0.831** (-2.12)	-0.204 (-0.64)	-0.079 (-0.32)	0.548 (0.82)	-0.807 (-1.30)	-0.521 (-1.30)	-0.883* (-1.89)	-0.202 (-0.53)	-0.101 (-0.34)
Accruals	-0.233 (-0.27)	0.386 (0.57)	-0.397 (-0.63)	1.516 (1.01)	0.982 (0.94)	-0.189 (-0.19)	0.609 (0.66)	0.148 (0.15)	-0.400 (-0.43)

Table 6 Continued

Big4	-0.033 (-0.06)	-0.332 (-0.89)	-0.433 (-1.31)	3.425*** ^a (6.17)	0.438 (0.66)	-0.220 (-0.38)	0.121 (0.18)	-0.565 (-0.97)	-0.783 (-1.53)
Opinion	0.672* (1.95)	0.566** (2.31)	0.204 (0.86)	0.226 (0.46)	0.151 (0.40)	-0.075 (-0.21)	0.263 (0.68)	0.959*** (2.77)	0.628* (1.83)
TIO	-0.560 (-0.31)	0.844 (0.89)	0.744 (0.88)	1.073 (0.48)	1.196 (1.00)	1.051 (0.96)	-2.573 (-1.23)	0.216 (0.18)	0.765 (0.66)
IB Rank				0.216 (1.02)	-0.229** (-2.42)	-0.108 (-1.21)			
Constant	-1.473 (-0.39)	-0.500 (-0.20)	1.437 (0.69)	-13.641** (-2.47)	0.420 (0.11)	0.860 (0.25)	-8.873* (-1.95)	-7.817** (-2.00)	-1.995 (-0.58)
Listing Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
N	269	269	269	138	138	138	131	131	131
Pseudo R ²	38.19%	19.18%	13.25%	29.23%	24.77%	18.22%	20.99%	21.74%	17.08%

a. We regard Arthur Andersen as one member of Big 4. There are 4 IPO firms audited by Arthur Andersen, 2 of which are subject to the SEC litigation.

Table 7**Comparison between Privatized Firms and Other Firms**

We define “P” as 25 firms that privatized successfully and “NP” as other 254 firms. *SEC* - an indicator variable, “1” if a firm faces any SEC litigation regarding accounting issues during 2000-2012, “0” otherwise; *Action* - an indicator variable, “1” if faces any SEC litigation or class action regarding accounting issues during 2000-2012, “0” otherwise; *Charge* - an indicator variable, “1” if a firm faces any charge from SEC or shareholders during 2000-2012 or media during 2009-2012, “0” otherwise; refer to Appendix 3 for definition of other variables. All continuous variables are winsorized at the 1st and 99th percentile. *, **, *** indicate significance levels of 10%, 5%, and 1% respectively, based on one-tail test.

	NP	P	Difference (NP-P)	T or Z test
SEC	0.083	0.000	0.083	1.50*
Action	0.315	0.080	0.235	2.46***
Charge	0.441	0.280	0.161	1.55*
Size	18.764	18.859	-0.095	-0.46
ROA	0.068	0.103	-0.035	-1.57*
ROE	0.088	0.153	-0.065	-1.81**
Leverage	0.292	0.268	0.024	0.59
CFO	0.057	0.084	-0.027	-0.85
Accruals	0.016	0.020	-0.004	-0.09
Growth	0.984	0.716	0.268	0.91
Loss	0.154	0.040	0.114	1.55*
BM	0.513	0.493	0.020	0.21
EBIT/Price	0.086	0.092	-0.006	-0.11
Age	8.044	8.430	-0.386	-0.43

Table 8
Institutional Holdings in Five Quarters after the Listing Date

This table compares institutional holdings of “bad” firms and “good” firms. See Table 5 for the definition of “SEC”, “Action”, and “Charge.” Institutional holdings are measured as the shares held by institutions over outstanding common shares at the end of each quarter, in percentage. Q1 indicates the quarter of listing date, and Q2-Q5 are the four quarters following Q1. *, **, *** indicate significance levels of 10%, 5%, and 1% respectively.

	Non SEC	SEC	Diff t-value	Non Action	Action	Diff t-value	Non Charge	Charge	Diff t-value
Panel A: Full sample									
Q1	6.78	5.81	0.40	6.38	7.50	-0.80	6.36	7.18	-0.64
Q2	9.85	10.91	-0.33	9.23	11.62	-1.32	9.17	10.96	-1.07
Q3	9.88	11.74	-0.61	9.21	11.95	-1.61	9.45	10.77	-0.85
Q4	11.23	16.19	-1.46	10.42	14.29	-2.04**	10.55	12.99	-1.38
Q5	12.11	16.71	-1.18	11.07	15.56	-2.20**	10.84	14.62	-1.99**
Panel B: IPO sample									
Q1	6.86	11.03	-0.90	6.60	8.49	-0.84	6.77	7.45	-0.35
Q2	10.11	10.78	-0.11	10.20	9.95	0.09	10.42	9.69	0.30
Q3	10.51	10.73	-0.04	10.59	10.28	0.11	10.63	10.33	0.12
Q4	12.57	21.00	-0.84	12.74	13.62	-0.26	12.71	13.37	-0.22
Q5	13.63	19.59	-0.75	12.93	16.86	-1.08	12.37	16.48	-1.28
Panel C: RM sample									
Q1	6.70	3.72	1.08	6.11	6.86	-0.42	5.88	6.96	-0.63
Q2	9.57	10.96	-0.37	8.05	12.71	-1.90*	7.69	12.03	-1.87*
Q3	9.20	12.21	-0.91	7.53	13.06	-2.52**	8.05	11.15	-1.57
Q4	9.84	13.97	-1.22	7.78	14.74	-3.19***	8.12	12.69	-2.29**
Q5	10.58	15.40	-1.24	8.99	14.71	-2.58**	9.15	13.19	-1.89*

Table 9

Market Responses to Significant Negative Events and Fraud Types

The table documents five dates with the worst three-day returns for 2010-2011. The portfolio level CAR[-1,1] is the mean of the abnormal returns for all Chinese firms listed in US. CAR[-1,1] is the difference between the cumulative return of each stock and the value-weighted market returns in the three day window around the five event dates. We identify the related significant news by reading through business news within a week of each date in Panel A. Panel B present the distribution of CAR [-1,1] for all Chinese firms listed in US around the five events. *, **, *** denote significance levels of 10%, 5%, and 1%, respectively.

Panel A. Significant Negative Events

	Event Date	Portfolio CAR (-1,+1)	Possible related news within the week
Event1	20110617	-6.07%	Citron research on Harbin Electric Inc. on 2011/6/17.
Event2	20110923	-5.49%	Reuters published on 2011/9/18: “internal research report of CSRC recommended to cancel VIE structure of Chinese firms”; On 2011/9/20, China’s Ministry of Commerce Spokesman said that the Ministry would explore ways to regulate VIE.
Event3	20110607	-5.45%	Muddy Waters Research on Sino-Forest Corporation on 2011/6/2
Event4	20110608	-5.37%	Interactive Brokers was barring its clients from using borrowed money to buy the shares of more than 130 Chinese companies (WSJ, 2011/6/8); SEC issued an investment warning for reverse merger firms on 2011/6/9.
Event5	20110930	-5.29%	“Justice Department probing Chinese accounting” by Reuters on 2011/9/29

Panel B. Frequency of Different Level of CAR(-1, 1)

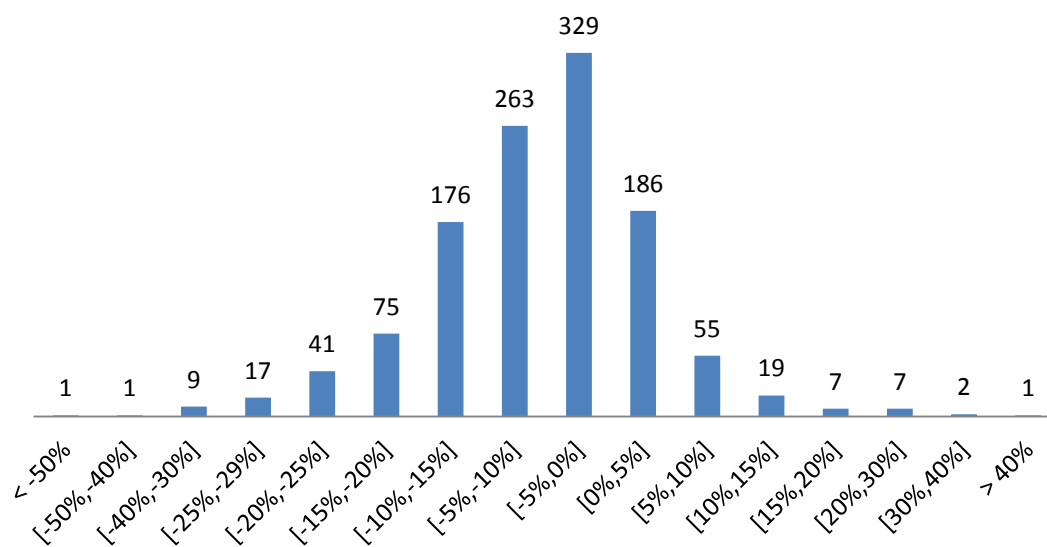


Table 10**Potential Monitors and Charge Measures**

The table compares the likelihood of frauds for the IPO firms audited by Big-5 and non-Big-5 auditors (Panel A) or the firms underwritten by prestigious and non-prestigious banks (Panel B).

Panel A Auditors				
Auditor	N	SEC	Action	Charge
Deloitte & Touche	53	1.8%	22.6%	41.5%
PricewaterhouseCoopers	29	10.3%	27.6%	37.9%
Ernst & Young	19	0%	10.5%	31.6%
KPMG	17	0%	23.5%	35.3%
Arthur Andersen & Co	3	33.3%	66.7%	66.7%
Others (Median)	1	0%	0%	0%
Big 5	121	4.1%	23.1%	38.8%
Non Big 5	19	5.3%	21.1%	36.8%
Difference	103	-1.1%	2.1%	2.0%
Panel B Underwriters				
Underwriter	N	SEC	Action	Charge
BofA Merrill Lynch	31	6.5%	12.9%	32.3%
Credit Suisse	31	0%	19.4%	35.5%
MORGAN STANLEY	28	3.6%	17.9%	28.6%
Goldman Sachs	19	5.3%	31.6%	47.4%
Deutsche Bank Securities	16	12.5%	25.0%	56.3%
Citigroup	16	0%	0%	12.5%
J.P. Morgan	15	0%	6.7%	20.0%
Others (Median)	1	0%	0%	0.0%
Prestigious Underwriter	156	3.8%	16.7%	33.3%
Other Underwriters	76	1.0%	7.2%	9.0%
Difference T-test	80	2.9%	9.5%	24.3%

Table 11
Monitoring Mechanism and Fraud Charges

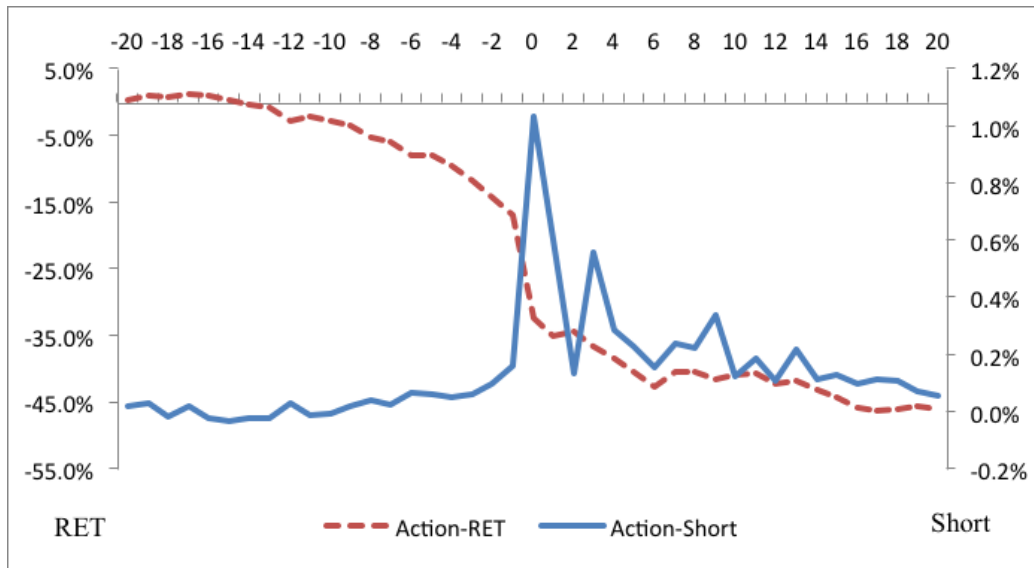
The table examines whether North America sales and US education is significantly associated with the likelihood of frauds. NA sales: dummy variable, “1” if there is any sales from North America around listing year (1 year before and 1 year after), “0”, otherwise. USEducation: dummy variable, “1” if the CEO receives degree(s) from US institutions (see Appendix 6), “0”, otherwise. *, ** indicate significance levels of 10% and 5% respectively.

	IPO Sample			Full Sample		
	SEC	Action	Charge	SEC	Action	Charge
	(1)	(2)	(3)	(4)	(5)	(6)
NA sales	-5.014*** (-4.02)	-11.234*** (-10.20)	-11.150*** (-11.48)			
USEducation				-4.751*** (-6.01)	-1.314*** (-2.89)	-0.895*** (-2.96)
IPO				-1.787*** (-2.85)	-0.793** (-2.50)	-0.487* (-1.79)
VIE	-0.313 (-0.60)	-0.651** (-2.03)	-0.397 (-1.34)	-0.009 (-0.02)	-0.351* (-1.67)	-0.111 (-0.61)
Size	0.218 (0.59)	0.399 (1.49)	0.282 (1.21)	0.440* (1.91)	0.356*** (2.59)	0.230* (1.94)
Leverage	-2.620** (-2.28)	-2.445** (-2.13)	-2.035** (-1.97)	-1.796** (-2.31)	-2.399*** (-4.00)	-1.786*** (-3.49)
ROA	-2.691* (-1.72)	-0.801 (-0.74)	-0.029 (-0.03)	-0.554 (-0.54)	-0.032 (-0.05)	0.275 (0.44)
Growth	0.004 (0.02)	-0.008 (-0.06)	0.052 (0.44)	0.193** (1.99)	0.079 (1.11)	0.086 (1.35)
BM	0.357 (0.54)	-0.627 (-1.01)	-0.366 (-0.90)	-0.693 (-1.62)	-0.115 (-0.35)	-0.008 (-0.03)
Accruals	1.367 (0.88)	0.775 (0.73)	-0.351 (-0.33)	-0.226 (-0.27)	0.338 (0.49)	-0.455 (-0.72)
Big4	3.693*** (7.23)	0.359 (0.51)	-0.123 (-0.20)	0.015 (0.03)	-0.209 (-0.55)	-0.328 (-0.99)
Opinion	0.262 (0.48)	0.411 (1.05)	0.101 (0.27)	0.655* (1.85)	0.575** (2.32)	0.199 (0.85)
TIO1	0.792 (0.33)	1.777 (1.27)	1.228 (0.98)	-0.399 (-0.21)	1.609 (1.49)	1.216 (1.34)
IB Rank	0.227 (0.99)	-0.164* (-1.66)	-0.058 (-0.61)			
Constant	-10.470* (-1.86)	-0.120 (-0.02)	1.309 (0.32)	-10.010*** (-3.08)	-10.062*** (-4.93)	-7.784*** (-4.45)
Listing Year	Controlled	Controlled	Controlled	Controlled	Controlled	Controlled
N	138	138	138	268	268	268
Pseudo R ²	31.93%	32.16%	26.28%	36.89%	22.07%	15.27%



Figure 1. Equal-weighted raw returns of the portfolio of Chinese firms in our sample from January 2, 2009 to December 31, 2012.

Panel A.



Panel B.

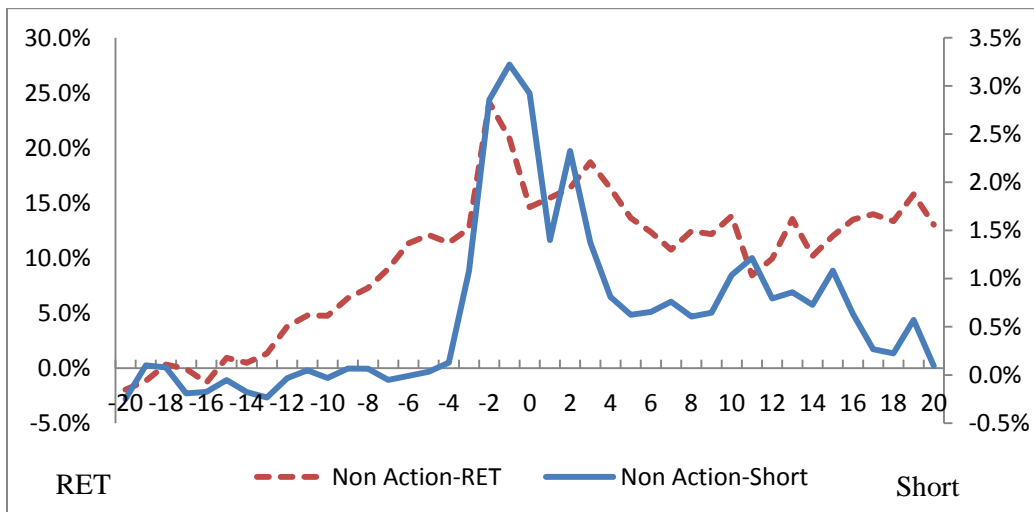


Figure 2. We identify 42 US listed Chinese firms with negative reports from short sellers, by searching Lexis-Nexis on keywords such as “strong sell”, “conviction sell”, “short”, “shorting”, “short seller”, “short position”, “short report”, “research report”, “allegation”, and variations of “allegation”. The sample includes 41 firms with exact dates of negative reports and short sales data. Panel A presents daily short sales and cumulated raw return of firms with fraud charges (SEC or Action firms) following the negative reports. Short is the percentage of abnormal short sales scaled by common shares outstanding. RET is cumulated raw return in the window of [-20, 20], where the report date is day 0. Action indicates a firm subject to the SEC litigation or class action during 2000-2012. Panel B presents daily short sales and cumulated raw returns for the firms with negative reports but not subject to the SEC litigation or class action.