

Shell Games: Are Chinese Reverse Merger Firms Inherently Toxic?

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November 6, 2012

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I. Introduction

Since the end of 2000, hundreds of Chinese companies have gone public on U.S. stock exchanges, most doing so through a “reverse merger” (RM).¹ This rapid growth in the number of Chinese firms listed on U.S. markets drew considerable media attention recently, when several of them were accused of accounting fraud. In early June 2011, the SEC warned investors against investing in firms listing via reverse mergers. In the same year, over 20 U.S. listed Chinese companies were either delisted or halted from trading, while a number of others had auditor changes or were the target of high-profile short-sellers.²

A central issue in the on-going regulatory review is whether existing laws governing reverse mergers are “too loose”, particularly as they pertain to foreign firms seeking entry to U.S. markets. In this discussion, Chinese firms hold center stage, as they have dominated recent foreign-based RM activities in the United States.³ On the one hand, appetite for Chinese equity is high, as many U.S. investors hope to participate in the booming Chinese economy; on the other hand, persistent worries remain that well-publicized corporate governance problems in China are being imported to U.S. markets through these “backdoor

¹ A reverse merger, also referred to as a “reverse takeover” or a “backdoor listing”, is a process whereby a private company is merged into a public company and the private company’s management team takes over the combined publicly traded company. At the time of the merger, the public company is typically a “shell” company – i.e., a non-operating entity that had gone through bankruptcy and is now dormant. The U.S. Public Company Accounting Oversight Board (PCAOB) reports that between 2007 and 2011 over 150 Chinese companies, worth \$12.8bn, entered U.S. markets through reverse mergers (compared to only 50 Chinese firms that filed for IPOs over this time period).

² See Meagher (2011), McCoy and Chu (2011) and Atkins (2011) for examples of media reports on Chinese RMs. High-profile research reports put out by short-sellers include the Jan 5, 2011 report by J Capital Research on China Green Agriculture, and the June 2, 2011, Muddy Waters Research report on Sino-Forest, a Toronto-listed RM firm, and multiple reports by Citron Research (<http://www.citronresearch.com/citron-knows-china/>). These reports have triggered a recent backlash in China. In a Sept 6, 2012 editorial, China’s official Xinhua news service complained such reports are a “malicious act” by U.S. firms seeking to “poison reputations of China start-ups for profit.” In the same month, 60+ Chinese business leaders set up a website decrying deliberate acts of “short and distort” by Citron Research against Chinese companies (<http://www.citronfraud.com/>).

³ Over our sample period (Jan 2001 to Dec 2010), about 85 percent of all foreign-based RMs in the U.S. were from China.

listings.”⁴

Bad press notwithstanding, the overall quality of the new wave of Chinese RMs is an open empirical question. While governance and accounting problems in China are well documented, a number of mitigating factors could operate in favor of these firms. First, rapid development of China’s economy has given rise to many promising start-ups. Second, until recently, private equity investors and venture capital funds are relatively scarce in China, leaving many entrepreneurs in want of capital. Over the past decade the set of IPO-eligible firms in China have far outnumbered the actual firms allowed to IPO each year.⁵ These factors suggest that Chinese RMs may derive from a relatively high quality candidate pool.

At the same time, it is unclear that the listing process associated with registration as a U.S. RM will necessarily be more attractive to “weaker” Chinese companies. While generally cheaper and faster than an IPO listing, the RM process has many limitations and problems for owners/entrepreneurs of the operating firm. Life as a U.S. publicly-listed firm involves assorted costs and risks (e.g., from on-going regulation and short-sellers) that may be more onerous than those in China. Moreover, to the extent that Chinese RM firms are exploiting a regulatory loophole to attain a “backdoor listing”, the same can certainly be said for U.S. RM firms.

In this study, we examine the initial financial health and subsequent performance of RMs that became active on U.S. stock markets between 2001 and 2010, with a particular focus on

⁴ Recent studies that document the corporate governance and accounting problems in China include: Jiang, Lee, and Yue (2010), Jian and Wong (2010), Piotroski and Wong (2012), and Piotroski and Zhang (2012).

⁵ Using data collected by China’s National Bureau of Statistics (NBS), Piotroski and Zhang (2012) assembled a sample of non-public Chinese firms that are ex-ante qualified to engage in an IPO on China’s stock exchanges. In China, all industrial companies with sales of more than RMB 5 million are required to report their financial data to the NBS via a standardized set of financial forms. Their sample of “exchange eligible firms” consisted of 28,152 firm-year observations over the period 2001 to 2008, where the underlying non-public industrial firm was financially eligible to engage in a Chinese IPO at the start of the calendar year. Of these observations, only 440 firms subsequently engaged in an IPO offering in one of China’s two domestic stock exchanges.

those from China. Using a carefully constructed (partially hand-collected) data set, we address two related research questions: (1) How have reverse mergers, in general, fared relative to a group of Industry-Date-Size matched publicly-traded firms from the same exchange listing venue? And, (2) What is the incremental effect of the “China Factor” – i.e., how has the confluence of economic factors associated with the recent surge in Chinese RMs incrementally impacted the quality of these particular offerings?

Our analysis is motivated by a need to distinguish between: (1) problems that are common to all RMs, and (2) problems that plague Chinese RMs in particular. This distinction is important because prior studies consistently find sharp differences between IPO firms and RM firms.⁶ Although IPO and RM are sometimes portrayed as alternative ways for a private firm to go public, in fact a majority of RM firms were never IPO-eligible, and their owners/managers never had the luxury of this choice.⁷ Whereas most IPOs begin their lives in one of the National Market System venues (NYSE, AMEX, or NASDAQ), most RMs begin trading on the OTC Bulletin Board (OTCBB) or as “Pink Sheet” stocks. Therefore, IPO firms are a poor benchmark by which to evaluate the aftermarket performance of RM firms.

By identifying a population of control firms that more closely mirror their ex-ante risk attributes, we provide striking new evidence on the aftermarket performance of RMs. Specifically, we employ an algorithm that pairs each RM with a control firm matched on Exchange (the listing venue), Industry (48 industry classifications in Fama and French

⁶ See, for example, Brau, Francis, and Koher (2003), Poulsen and Stegemoller (2005), Brown, Ferguson, and Lam (2010). As a group, the RM firms are much smaller, less profitable, face faster cash burn, have fewer financing options, are earlier-stage in terms of development, and tend to be in more highly leveraged industries. In short, RMs are much more cash strapped and speculative in nature than IPOs.

⁷ RMs involving a special purpose acquisition company (SPAC) are an exception to this general rule. Although they are technically RMs, most SPACs are much more similar to self-registered IPOs (Feldman (2009)).

(1997)), Date (of the RM's first 10-K filing), and Size (the market capitalization). We then compare various financial health and performance metrics for these two samples at the reporting date of the RM's initial 10-K filing, as well as at each of the next three anniversary dates.⁸

Aside from evaluating the health and performance of RMs in general, we are also interested in isolating a "China Factor". While media reports often claim Chinese RMs perform poorly, the evidence to date has been largely anecdotal. In those rare instances where large-sample statistics are computed, Chinese RMs have been compared to established U.S. stocks, or to newly-listed Chinese IPOs, both of which are much larger, more mature, and more liquid to begin with.⁹

To the extent that a problem exists with Chinese RMs, a key objective of this study is to better understand how much of the problem derives from the inherent risks associated with RMs, as a group, and how much is attributable to their country of origin. We do so by comparing Chinese RMs to: (1) a set of U.S. RMs listed over the same time period, (2) a set of publicly traded control firms matched on Exchange-Industry-Date-Size, and (3) the same set of U.S. RMs, after adjusting for the effects of Exchange-Industry-Date-Size, using a difference-in-difference research design.

Our results show that as a group the RMs perform poorly; but no more so than their matched control firms. We confirm prior findings that RMs tend to be small and illiquid stocks to begin with; that most begin their lives on the OTCBB or Pink Sheet; and that they

⁸ Because most RMs trade on the OTCBB or the Pink Sheet, information about their historical exchange venue and stock returns are not available in the CRSP database. To ensure proper matching, we hand collect this information for both the RM sample and the eligible matching firms, from their 10-K filings.

⁹ For example Alpert and Norton (2010) compare the first three-year returns on 158 Chinese RMs to the Halter Index (an index of U.S. listed Chinese ADRs dominated by names like Baidu.com and China Mobile), as well as the Russell 2000 (an index of U.S. Small Cap stocks).

are highly prone to default and/or delisting over time. However, after controlling for the exchange venue, as well as Industry-Size-Date, we find no evidence that the recent batch of RMs is riskier than other publicly listed firms. In terms of subsequent operating performance and stock returns, the RM firms are no worse than the control group. In fact, the RMs in our sample outperformed their matched control firms in terms of survival rate and improvement in market liquidity over the three years after the RM's first 10-K filing.

We show that the better performance of the RMs is largely due to the Chinese companies within the RM group. Contrary to popular media perception, we find no evidence that Chinese RMs are systematically riskier, or more problematic. In fact, we show that Chinese RMs are generally healthier than U.S. RMs at the initial 10-K reporting date, and that they continue to fare better than either their U.S. counterparts, or a group of Industry-Size-Date matched publicly-traded firms from the same exchange. At the beginning of their public lives, Chinese RMs have higher market capitalization, lower leverage, higher profitability and cash flows, and lower risk of financial distress than their U.S. peers. Over the next three years, Chinese RMs are less likely to go bankrupt and have a higher probability of moving up the exchange tiers.

A potential concern with our finding is that U.S. RMs may be more “lottery-like,” and that their outcomes exhibit greater positive skewness. In other words, although Chinese RMs may be less risky (i.e., more likely to survive), the U.S. RM population potentially contains more “home runs” (large positive outliers), which compensates for this difference. To examine this possibility, we compare the performance of the two RM samples conditioned on survival for three years. We find that, once again, the surviving Chinese RMs dominate the surviving U.S. RMs in terms of operating performance and earned returns. The same

results hold when we use a difference-in-difference approach to eliminate the confounding effects of size, exchange venue, time, and industry. In short, the superior performance of the Chinese RMs is not driven by differences in either their probability of survival or skewness in their distribution of outcomes.

Another possible concern is that the frauds perpetuated by Chinese RMs are so elaborate and extensive that a three-year period is not a sufficiently long for the market to unravel them. To address this possibility, we identified a list of 32 Chinese RM fraud cases cited by the SEC, U.S. media, or short sellers since 2010 (see Appendix A). We show that the vast majority of these firms are in our sample. We then re-computed our results for all RM firms from their inception date to the end of 2011 (i.e. including the period during which many of Chinese RM firms were publicly accused of fraud and thus delisted). Our results show that collectively, the survival rate and exchange mobility of the Chinese RM firms (including those alleged to have committed frauds) were still better than their control firms, even when both samples were extended to the end of 2011. Moreover, while the U.S. RM firms had stock returns that were lower than their control firms, the returns of the portfolio of Chinese RMs were statistically indistinguishable from their control firms.

Our findings are related to, and extend, the existing literature on reverse mergers. Prior research that studies the RM market has consistently found that these firms are riskier and more speculative than IPOs. However, the analyses generally frame RM and IPO as alternative routes to going public. Using a hand-collected dataset that more closely match their ex-ante risk profile, we show RM firms do not, as a group, underperform similar publicly-listed firms. These results do not support the view that current RM listing procedures are “too loose”.

We also help to put into perspective concerns with Chinese RM firms. While legitimate issues remain with the structural integrity of corporate governance and internal control of Chinese firms, our evidence indicates that the current Sino-phobic reaction to Chinese reverse mergers is overblown. The set of Chinese RMs admitted to U.S. markets through our sample period have generally performed well compared to both their U.S. counterparts, and to matched control firms. This is true even after accounting for the wave of negative sentiment against Chinese RMs during 2011. Indeed, our findings suggest the problems identified in the press are more appropriately attributed to risks endemic to the markets in which RMs reside, rather than to issues specific to China, per se.

The remainder of our study is organized as follows. Section II provides institutional background on reverse mergers; surveys the prior literature; and develops our main hypotheses. Section III describes our sample selection and data collection process. Section IV discusses our empirical results. Finally, Section V summarizes these findings and considers implications for investors, regulators, and future research.

II. Background and Literature Review

II.1 Reverse mergers

A reverse merger is the culminating event in a series of economic decisions involving several key players. On the demand side, the owners/operators of a private company in need of capital decide to go public and engage a financial intermediary (a “shell promoter”) to assist them with a RM transaction. On the supply side, a market exists for the sale of publicly-listed “shell” companies. Typically the existing shell is a relic from a previously failed business. During bankruptcy proceedings, the shareholders of the former shell agrees

to certain concessions in exchange for a share in any profits gained if/when the shell is sold.¹⁰ These events are depicted in Figure 1, which we discuss in more detail in Section III.

Prior studies have addressed both the supply and the demand side of the market for RMs. On the supply side, Floros and Sapp (FS; 2011) and Gleason, Rosenthal, and Wiggins (2005) investigate the business of investing in shell companies. FS, in particular, note that private firms going public via RMs are often motivated by the need to quickly secure financing through privately placed stock (PIPEs) and the desire to make acquisitions using stock as payment. When a takeover agreement is consummated, shell companies' three-month abnormal returns are high (FS: on average, 48.1%), perhaps reflecting the compensation to investors for shell stock illiquidity and the uncertainty of finding a reverse merger suitor.

On the demand side, prior studies have largely focused on the motivation for using a RM rather than an IPO, from the perspective of the private firm. For example, Poulsen and Stegemoller (2005), Brau, Francis, and Kohers (2003), and Brown, Ferguson, and Lam (2010) identify a number of factors associated with this choice, including industry concentration, current cost of debt, relative "hotness" of the IPO market, and insider ownership percentage. In the same spirit, Adjei, Cyree, and Walker (ACW; 2008) show RM firms are typically smaller, younger, and have poorer ex ante performance. RMs are also riskier – ACW show that within 3 years of listing, forty-two percent of the RMs are delisted compared to 27% of matched IPOs.

Although RMs are generally cheaper and quicker than traditional IPOs,¹¹ a number of

¹⁰ Although the firm is operationally dormant, it is allowed to maintain its publicly-listed status on the OTCBB or Pink Sheet, if it continues to pay an annual registration fee.

¹¹ Underwriting costs for an IPO typically ranges from 7 to 12 percent of the total offer, while the price for purchasing a shell company is generally around \$50,000 to \$500,000. At the same time, unlike an IPO, a reverse merger can be completed within weeks (Atkins (2011)).

studies (particularly those by practitioners and legal scholars) warn of the risks and costs facing private firms that elect the RM route (e.g., Sjostrom (2008) and Feldman (2009)). Typically, the amount of capital raised via a RM is much less than from an IPO, as initial financing often depends on private sources arranged by the promoter. In the aftermarket, liquidity can be minimal, and the firm faces risk from short-sellers. In addition, as a publicly listed firm, a new RM faces significant on-going regulatory costs, which can be onerous for a small firm with cash constraints.¹²

In sum, the operators/owners of a private firm engaged in a RM generally have weak bargaining power (see Chaplinsky and Haushlter (2010) for a good discussion of the role of issuer bargaining power in the context of PIPEs). RM firms tend to be at earlier-stage, and more speculative than their IPO peers, and typically face tighter financing constraints. Many also have a pressing need to provide their employees with liquidity for their equity stake in the firm. They have self-selected into the RM process not because they wouldn't have preferred to go public via an IPO, but because for most of them, an IPO was never a realistic option.

The central stylized fact that emerges from these studies is that RM firms are strikingly different from IPO firms. In light of the foregoing, we argue that a proper assessment of RM aftermarket performance calls for a comparison, not between RMs and IPOs, but between RMs and firms that are inherently closer in terms of their ex-ante risk profile. We address this problem using a detailed and partially hand-collected dataset that controls for

¹² The on-going costs of a public listing weigh disproportionately on small firms. Both Leuz, Triantis, and Wang (2008) and Marosi and Massoud (2007) examine the causes and economic consequences of voluntary SEC deregistrations ("Going Dark"). They find that firms with fewer valuable growth opportunities, greater insider ownership, worse future prospects, and the increased compliance costs associated with SOX, tend to go dark. Iliev (2010) shows that the compliance costs of the Sarbanes-Oxley Act (SOX) fall disproportionately on smaller firms.

exchange listing venue, as well as industry, date of filing, and firm size.

II.2 The China factor

The recent rash of accounting frauds in Chinese RM companies has brought the need for tighter regulation of these firms into the limelight. In June 2011, the SEC issued a general warning advising against investing in firms listing via a reverse merger. During 2011, more than 20 U.S. listed Chinese companies were delisted or halted from trading. Some of these were accompanied by sensationalistic research reports by known short-sellers. The general perception, fueled by multiple media reports, is that Chinese reverse mergers are inherently toxic.

The case against the Chinese RMs is based on two key arguments. First, it is alleged that a weak regulatory environment and a “wild west” mentality give rise to rampant fraud in China – a perception no doubt reinforced by recent concerns about the safety of Chinese toys and food. Second, it has been alleged that strong Chinese firms come into the U.S. via IPOs, and that the Chinese RM candidates are looking to skirt regulatory scrutiny via a “backdoor listing.”¹³

As an emerging economy, China has less stringent corporate governance norms and weaker minority shareholder protection laws than most developed countries. These problems are well documented, and are the impetus for a wide-ranging agenda for regulatory reform in China.¹⁴ On the other hand, there are also compelling reasons why Chinese RMs might not be as toxic as they are portrayed in the media. In particular, we note:

¹³ This argument applies, of course, equally to U.S. RMs.

¹⁴ See Allen, Qian, and Qian (2005), Jian and Wong (2010), Jiang, Lee, and Yue (2010), Piotroski and Wong (2012), and Piotroski and Zhang (2012).

1. China has experienced explosive growth and until recently access to alternative capital sources (private equity, VC funds, etc.) is quite limited. This increases the likelihood that Chinese RMs are derived from a pool of high quality candidates.
2. IPO markets in China are highly competitive and Chinese listing standards require bright-line profitability tests that are much more stringent than U.S. requirements. In recent years, many thousands of IPO-eligible firms in China remain unlisted.
3. For a Chinese firm, the RM route to a U.S. listing is not trivial. In addition to the usual hurdles faced by U.S. RMs, Chinese RMs must first register with China's State Administration of Foreign Exchange (SAFE) (Feldman (2009); Chapter 5). They then have to be "acquired" by a foreign-based entity (typically based in the Cayman Islands or some other exotic locale).
4. Chinese firms that take the U.S. RM route voluntarily expose themselves to U.S. listing regulations, as well as the scourge of short-sellers (no short-selling is allowed in China).

The evidence in a related working paper, Darrough, Huang, and Zhao (DHZ; 2012), further thickens the plot. DHZ examines the spillover effect of recent negative news on Chinese RM frauds. They show that the news surrounding Chinese RMs had a dampening effect not only on the share prices of the accused firms, but also the returns of other seemingly legitimate Chinese RMs and IPOs. Moreover, it appears that this spillover effect did not carry over to U.S. RMs and RMs from other countries. They conclude that the negative market reaction appears to be China-focused, rather than reverse-merger focused.

In our minds, despite recent bad press, the overall quality of the Chinese RMs remains an open empirical question. It is quite plausible that Chinese RMs are drawn, ex-ante, from a

higher quality pool of candidate firms. Given the costs associated with the process, weaker Chinese firms will not necessarily find it attractive to “self-select” into the RM pool. Moreover, the current literature provides no evidence that Chinese RMs, as a group, actually underperform other listed U.S. firms from the same exchange venue.

III. Sample Selection and Data Description

Figure 1 depicts the three stages in the formation of a RM firm. The formation of a shell company marks the starting point of the process.¹⁵ Generally there are three types of shell companies: virgin shells (created with the sole intent of merging with unidentified single or multiple companies), development stage shells (created with a business plan that fails to materialize), and natural shells (created after divesting operations and assets following bankruptcy). According to DealFlow Media (DFM), the provider of the proprietary data used in our study, as of July 2012 there are 1,268 shell companies, among which 625 are publicly traded on OTCBB or Pink Sheet.

Stage 2 is the completion of a RM transaction. We obtain our sample of RMs from the DFM Reverse Merger Report.^{16,17} The original sample includes 1,608 RMs that became active on U.S. stock markets between January 2001 and December 2010. For each deal, DFM reports considerable amount of information, such as the names of the private firm and

¹⁵ The SEC defines the term "shell company" as a registrant, other than an asset-backed issuer, that has no or nominal operations, and either: no or nominal assets; assets consisting solely of cash and cash equivalents; or assets consisting of any amount of cash and cash equivalents and nominal other assets.

¹⁶ An alternative source to identify RMs is the Thomson Reuters SDC Platinum database. The DFM sample has two important advantages over the SDC sample. First, while SDC defines private firms' country based on headquarters, DFM defines country classification based on the location of its main operations. Second, the DFM sample has a more complete and comprehensive listing of RMs. As cross-validation, we check our RM sample against the set of RMs in the SDC database.

¹⁷ DFM defines a merger as reverse merger if it satisfies the following conditions: (1) the merger is between a private firm and a public company; (2) the public company is a shell company; (3) the private firm has real operations; (4) the shareholders of the private firm own a majority (50% or more) of the surviving company; and (5) the surviving company will continue the private firm's operations.

the shell firm, the surviving firm's name and ticker, and the deal structure. DFM defines each private firm's country of origin based on the location of its operation rather than the place of incorporation or the headquarters' address. For observations with incomplete country information, we hand collect it from the SEC filings.

Stage 3 is the filing of the first 10-K form by the surviving company. Some public shells report under SEC rules; others do not. The surviving company of a RM may still retain the non-reporting status of the shell company. A reporting company is obligated to file quarterly, annual and other regular reports with the SEC and is subject to other rules regarding insider trading, soliciting proxies, and the like. Most companies that trade on the Pink Sheet may do so without reporting.¹⁸

We view filing 10-K as an indication that the RM firm is serious about accessing public capital markets. We match the DFM sample with COMPUSTAT using CIK numbers.¹⁹ Few RMs actually become active entities. In our sample, only 489 observations have post-RM data on the COMPUSTAT Fundamentals Annual database. The mean and median time between the date of RM and the reporting date of the first 10-K filing are 310 and 226 calendar days, respectively.

To evaluate the risk and performance of the RMs, we create two samples. The Inception Sample, consisted of the RM firms that filed their first post-RM 10-K prior to 2012, is created to examine the financial health of the RMs at the beginning of their public lives. The Long-run Sample, consisted of the RM firms that filed their first post-RM 10-K prior to

¹⁸ If a company does an IPO, it is subject to reporting requirements only for one year. After that year, the company may cease reporting and the stock may continue trading on the Pink Sheet. The only requirement is that certain basic information be provided to brokerage firms making a market in the company's stock.

¹⁹ In the case of shell companies that completed more than one reverse merger, we only retain the last deal. As a result, 37 observations are excluded from the sample.

2009, is created to evaluate the performance of the RMs at each of the next three anniversary dates subsequent to the initial 10-K filing. To reduce the effects of outliers, we winsorize all financial variables using 1% and 99% cut-off values, based on the annual COMPUSTAT population. We also manually check firms' 10-K filings to ensure that the extreme values of financial variables (e.g., $|\text{return on assets}| > 1$ or $\text{leverage} > 1$) are not caused by data error.

Central to our research design is a matching algorithm that selects a control firm for each RM in our sample. To construct our control group, for every RM firm, we identify all firms from the same industry (defined by the 48 industry classifications in Fama and French (1997)) and exchange venue (NYSE/AMEX, NASDAQ, OTCBB, and Pink Sheet) that also filed 10-K in the same year as the RM's first 10-K filing (hereinafter referred as Year T). We exclude firms that completed a reverse merger during our sample period from the pool of 10-K filers. We then define the matched control as the firm with a market value of equity closest to the RM firm as of the end of year T.

We hand-collect historical exchange listing information of the RM firms from their 10-K filings.²⁰ For the control firms' exchange venue, we first rely on the historical stock exchange information in CRSP, which covers stocks traded on AMEX, NYSE or NASDAQ. Firms not covered by CRSP typically trade on the OTCBB or the Pink Sheet. To ascertain their listing venue, we manually examine each prospective control firm's 10-K filings. If a prospective firm turns out to be a mismatch (e.g., the control is listed on the OTCBB while the RM firm is listed on the Pink Sheet), we continue down the list of prospects until we have exhausted the entire pool of 10-K filers in the potential control group. Overall, we are able

²⁰ Because most RMs began their public lives on the OTC markets (e.g., OTCBB or Pink Sheet), information about their historical exchange venue is not available in CRSP.

to match 424 RMs with controls in the Inception Sample and 352 RMs with controls in the Long-run Sample.

Table 1 provides an overview of the number of RMs in our samples, distributed by country of origin (Panel A) and by year of merger (Panel B). As Panel A shows, U.S. RMs (i.e., the private firm is a U.S. company) constitute nearly 60% of both the Inception Sample and the Long-run Sample. RM firms from China account for 34% of the samples (or about 85% of all non-domestic RMs). RM firms from other foreign countries account for only 6% of the samples. As Panel B shows, the number of RMs in the original DFM sample increases significantly since 2004 and reaches a peak of 257 in 2010. Days2Filing refers to the number of calendar days between the merger date and the reporting date of the firm's first 10-K filing. On average, the sample RM firms file their first 10-K within one calendar year after the merger date.

We rely on Datastream rather than CRSP for stock return and price information because most of the RM firms and control firms trade on OTC markets. To compute the annual buy-hold returns, we extract raw monthly returns from Datastream (data type=RI) and adjust the raw returns for delistings and acquisitions. To make these adjustments, we begin with the "inactive date" identified by Datastream. We then match this information to our hand-collected exchange venue and listing status to determine whether this "inactive date" was triggered by a delisting or an acquisition. Following Gerakos, Lang, and Maffett (2011), we set delisting returns to -100 percent. For acquisitions, we hand collect the acquisition prices and redistribute (reinvest) the final liquidation value equally in all the other firms in the same group. For example, if a RM firm is acquired, its liquidation value is reinvested into all the remaining RMs in the sample. We then compute the annual buy-hold returns for

each of the next three years starting four months after the first 10-K reporting date.

To ensure our sample includes companies accused of fraud in recent years, we also separately identified a list of Chinese RM firms that were cited by the SEC, U.S. media, or short seller reports since 2010, as being under suspicion of fraud. Appendix A lists each of these 32 firms, together with various descriptive statistics, including the reverse merger date, the date trading was halted, and whether each was added to Pink Sheet or was subsequently delisted.²¹ Note that only six of these 32 firms are not in our sample (four because they were not in DealFlow, one was missing COMPUSTAT data, and one because the RM deal was completed prior to our sample period). In short, our sample includes the vast majority of Chinese RM firms that are the subject of the recent wave of negative publicity.

IV. Empirical Results

IV. 1. Key firm characteristics in the year of the RM's first 10-K filing

Reverse mergers vs. control firms

To evaluate RMs' risk and performance, we compare a number of metrics, including capital structure, market liquidity, operation, audit opinion and financial distress, between RMs and control firms (CLs) in the year of the RM's first 10-K filing. We use the 424 RMs in the Inception Sample and their matched CLs for this test. The matching algorithm controls quite well for size in the two groups. The mean market value of equity (MCAP) of RMs is about \$90 million while the mean MCAP of CLs is around \$83 million, suggesting that both RMs and CLs tend to be small firms. The difference between the two groups is

²¹ This list is based on information as of October 2012. While probably not exhaustive, we suspect it captures most of the Chinese RMs swept up in the recent scandal. For comparison, DHZ reports 33 such firms (although they do not list the names).

not statistically significant (t-stat = 0.41).

In terms of capital structure, RMs have similar leverage (LEV) and current ratio (CR) as CLs. It is worth mentioning that the mean LEV, measured as the sum of short-term and long-term debts divided by total assets, is 1.68 for RMs and 1.43 for CLs, while the median LEV is 0.49 and 0.50, respectively. These statistics indicate that the firms in both groups are highly levered, and in fact close to insolvency. We use SPREAD to measure market liquidity, which is the difference between a stock's monthly closing ask price and bid price divided by the bid-ask midpoint, averaged over the 12 months of the year. The mean SPREAD is 25.09% for RMs and 15.36% for CLs, with the difference significant at 1% level (t-stat = 5.45). The bid-ask spreads are quite high even by OTC standard. For example, Ang, Shtaubert, and Tetlock (2011) report that the mean bid-ask spread is 13% for a sample of OTC stocks from 1977 to 2008.

We use income before extraordinary items divided by total assets (ROA) and cash flow from operations divided by total assets (CFO) to measure operating performance. The summary statistics show that both the RMs and CLs are dominated by loss firms. The mean ROA is -1.71 and -1.34 and the mean CFO is -0.60 and -0.57 for RMs and CLs, respectively. The results suggest that many of these firms may not survive as going concerns. Indeed, about 50% of both RMs and CLs did not receive a clean and unqualified audit report (AUQ). Based on a cursory review, a majority of these audit reports express concerns about the firms' ability to continue operations as a going concern. Appendix B presents two examples of the typical audit report for the sample firms. The grim outlook of both RMs and CLs is also

reflected in their Altman bankruptcy score (ZSCORE), a measure of financial distress.²² The mean ZSCORE is -40.07 for RMs and -57.66 for CLs, both well below the 1.1 threshold for financial distress.

Overall, the results in Panel A of Table 2 show that in the year of the first 10-K filing, the RM firms are speculative investments highly prone to default and/or bankruptcy risk. They tend to have extremely small market capitalization and are extremely illiquid. Most of these firms would not pass the stringent IPO requirements of the National Market System venues (e.g., NYSE/AMEX and NASDAQ). At the same time, these RMs are not notably worse than the control sample, matched by our algorithm. In short, both RM and CL firms reflect the risks inherent in investing in early-stage penny stocks that populate the OTCBB and Pink Sheet.

Chinese RMs vs. U.S. RMs

We also compare the same metrics between Chinese RMs and U.S. RMs in the year of their first 10-K filing. The results are reported in Panel B of Table 2. The mean MCAP is \$108.98 million for Chinese RMs and \$76.47 million for U.S. RMs, with the difference significant at 5% level (t-stat = 2.37). Compared to their U.S. peers, Chinese RMs are much less financially constrained. Chinese RMs have significantly lower leverage (0.51 vs. 2.31) and much higher current ratio (3.87 vs. 2.52) than U.S. RMs. However, Chinese RMs have lower market liquidity than their U.S. counterparts at beginning of their public lives. The mean SPREAD is 31.77% for Chinese RMs as compared to 20.33% for U.S. RMs.

²² ZSCORE is computed using the revised model for non-manufacturers and emerging markets in Altman (2002): $6.56 * (\text{current assets} - \text{current liabilities}) / \text{total assets} + 3.26 * \text{retained earnings} / \text{total assets} + 6.72 * \text{earnings before interest and taxes} / \text{total assets} + 1.05 * \text{book value of equity} / \text{total liabilities}$. ZSCORE below 1.1 indicates financial distress.

Chinese RMs also appear healthier than U.S. RMs in terms of operating performance, as witnessed by their much higher mean ROA (-0.08 vs. -2.57) and mean CFO (-0.01 vs. -0.95). At least half of the Chinese RMs are profitable (median ROA = 0.12) and generate positive operating cash flows (median CFO = 0.05). In contrast, the median ROA and CFO for U.S. RMs are still significantly negative (-0.73 and -0.38, respectively).

Finally, U.S. RMs are much more financially distressed than Chinese RMs. The mean and median ZSCOREs for U.S. RMs are -65.22 and -9.76 respectively, which are well below the threshold for financial distress. In contrast, the mean and median ZSCOREs for Chinese RMs are 6.44 and 6.15 respectively, which are in the “Safe” zone according to the Altman’s model. Auditor reports also confirm that Chinese RMs have a better outlook than U.S. RMs. For 60% of U.S. RMs, auditors issue qualified opinion or express concerns about the company’s ability to operate as a going concern. The percentage among Chinese RMs is much lower, at 23%.

Overall, the results in Panel B of Table 2 show that at the beginning of their public lives, a typical Chinese RM looks much healthier than a typical U.S. RM. U.S. RMs are smaller, have much poorer operating performance, and appear decidedly riskier than Chinese RMs.

IV. 2. Survival rates and subsequent changes in exchange venue

The operating results and the measures of financial distress in Table 2 all indicate that the RMs and CLs are highly prone to bankruptcy risk. In this section, we analyze survival rates and changes in exchange venue for these firms. We also compare the survival rate between Chinese RMs and U.S. RMs. In order to assess the survival rate at the RMs’ three-year anniversary dates, we use the pre-2009 RMs (i.e., the “Long-run Sample”) and

their matched controls.

Reverse mergers vs. control firms

Panel A of Table 3 reports the distribution by exchange venue for RMs and CLs in the year of the RM's first 10-K filing (i.e., Year T) as well as the three years thereafter. Because we match RMs with CLs on exchange venue, both groups have identical distribution in Year T. The results show that in Year T, 88.1% of the RMs trade on Over-The-Counter Bulletin Board (OTCBB); 6.3% trade on the National Market System venues (NMS; consisting of NYSE/AMEX and electronically quoted NASDAQ stocks); and the remainder trade on OTC Pink Sheet (PINK).

In Year T+1, the paths of the RMs and CLs diverge. Although both groups have more firms trading on the NMS, the percentage is higher among RMs (21.0% vs. 15.6%). Compare to CLs, fewer RMs trade on PINK (6.0% vs. 10.5%), or disappear due to bankruptcy ("DEAD"), or are acquired ("ACQ"). The results suggest that at the one-year anniversary date, RMs generally perform better than CLs in terms of survival rate or upward mobility in exchange tiers.

The same trend continues over the next two years. By the end of Year T+3, 35.8% of the RMs trade on the NMS, comparing to 20.2% of CLs. These firms are the crown jewels of the RM population in the sense that they not only survived but also passed the strict listing requirements of the NMS. By the end of Year T+3, a majority of the RMs still trade on the OTC markets: 34.4% on OTCBB (42.9% for CLs) and 25.6% on PINK (24.4% for CLs). In short, most of these firms were still struggling to find a viable business model and were probably close to the end of their public lives. The remaining RMs either are acquired (0.3%

vs. 4.0% for CLs) or go bankrupt (4.0% vs. 8.5% for CLs).²³

Panel B of Table 3 reports the proportion of RMs and CLs that move up (e.g., from PINK to OTCBB, or from OTCBB to NMS) or are acquired (“UP”), move down or are defunct (“DOWN”), or remain unchanged (“NCHG”) in terms of exchange tier. There are clearly more RMs moving up exchange tiers than CLs. For example, at the end of Year T+3, 31.3% of the RMs trade on higher tiers than their initial exchange venues. In contrast, only 19.6% of the CLs move up their exchange tiers. The difference is significant at 1% level (t-stat = 3.60). Although fewer RMs move down exchange tiers than CLs in the first two years, by the end of Year T+3 the difference is not statistically significant (t-stat = -1.43). Figure 2 clearly depicts the differences between RMs and CLs in terms of their upward (Panel A) and downward (Panel B) mobility within the exchange tiers.

Chinese RMs vs. U.S. RMs

We also compare the survival rates and changes in exchange venue between Chinese RMs and U.S. RMs. Panel C of Table 3 reports the distribution by exchange venue for the two groups. In Year T, the vast majority (95.8%) of Chinese RMs trade on OTCBB. Only 0.8% of Chinese RMs trade on the NMS, with the remainder quoted on PINK. In contrast, the distribution is more diverse for U.S. RMs, with 8.9% of them trading on the NMS, 84.0% on OTCBB, and 7.0% on PINK.

Although there are fewer Chinese RMs trading on the NMS than U.S. RMs in Year T, the Chinese RMs catch up very quickly. By the end of Year T+1, there are already more

²³ The percentage of “DEAD” RMs is much smaller than the failure rate (43%) reported in Adjei et al. (2008). The main reason is that they required stock return data to be available on CRSP. Thus their sample is restricted to RMs that went public on the NMS. Moreover, they score a RM as a failure if the stock was demoted to OTC markets. In our sample, we treat a firm as “DEAD” if it disappears from the public sight for reasons other than acquisition.

Chinese RMs trading on the NMS than U.S. RMs (23.7% vs. 20.7%), although the difference is not significant ($t\text{-stat} = 0.63$). By the end of Year T+3, the percentage of Chinese RMs trading on NMS is more than twice as many as the percentage of U.S. RMs (55.9% vs. 26.3%). Compared to their U.S. counterparts, Chinese RMs are much less likely to trade on a lower exchange tiers like OTCBB or PINK at their three-year anniversary dates, and they are also much less likely to go bankrupt (0.8% vs. 5.6% for U.S. RMs). These results show that Chinese RMs not only appear healthier from Day 1, but in fact they continue to perform better, in terms of avoiding default and delisting risk, than their U.S. counterparts.

Panel D of Table 3 reports the proportion of “UP”, “DOWN” and “UCHG” in Chinese RMs and U.S. RMs. Consistent with results in Panel C, the majority (55.1%) of Chinese RMs trade on a higher tier at their three-year anniversary dates than their initial exchange venue. In contrast, only 19.7% of U.S. RMs move up exchange tiers or are acquired. Figure 3 clearly shows the differences between Chinese RMs and U.S. RMs in terms of moving up (Panel A) and moving down exchange tiers (Panel B).

To summarize, the evidence so far suggests that RMs and CLs have similar characteristics in Year T except for market liquidity and bankruptcy risk. In Year T, RMs have lower liquidity measured by bid-ask spread than their Exchange-Industry-Size-Date matched peers. However, RMs also have lower bankruptcy risk measured by Altman’s Z-score, which is manifested in the higher survival rate of RMs in the future three years. The comparison in Year T between Chinese RMs and U.S. RMs shows that Chinese RMs are much healthier than U.S. RMs in terms of market capitalization, financial constraint, operation performance, and bankruptcy risk. Chinese RMs also have a much higher survival rate and are more likely to move up exchange tiers over the next three years.

Next we compare the future performance between RMs and CLs and between Chinese RMs and U.S. RMs conditioning on both RMs and their matched CLs survive at the end Year T+3. This comparison will bias the results in favor of the CLs and the U.S. RMs, as they are more likely to fail. However, we perform the comparison to examine whether the U.S. RMs as a group have more positively skewed performance – i.e. whether the U.S. RM population contains a greater proportion of “lottery picks”.

IV. 3. Comparing future fiscal performance

Reverse mergers vs. control firms

In this section, we compare the performance of RMs and CLs over the three years after the RM’s first 10-K filing. The performance metrics we use include ROA, CFO, AUQ, and SPREAD. We require that both RMs and their matched CLs survive at the end of Year T+3 (i.e., have non-missing financial data from Year T+1 to Year T+3). The sample consists of 173 RMs (including 68 Chinese RMs and 96 U.S. RMs) and their matched CLs.

Panel A of Table 4 reports the comparison between RMs and CLs. The results show that conditioning on survival, there is no significant difference between RMs and their matched CLs except for SPREAD in Year T+3. Both groups report stable but negative mean and median ROA and CFO over the three years, suggesting that the operating performance of both groups hardly improves over time. In Year T+1, for 40% of RMs and 49% of CLs, auditors issue qualified opinion or express concerns about the firm’s ability to continue as a going concern. The percentage is approximately the same in Year T+3: 46% for RMs and 49% for CLs. The mean SPREAD of both groups increases over time: from 13.43% (10.61%) in Year T+1 to 16.11% (22.63%) in Year T+3 for RMs (CLs). However,

the median SPREAD for RMs decreases from 7.05% in Year T+1 to 3.69% in Year T+3. Thus the RMs' market liquidity generally improves over the three-year horizon but the distribution becomes more right-skewed. In contrast, the CLs' market liquidity generally deteriorates over the same period.

Overall, the results in Panel A of Table 4 show that both RMs and CLs perform poorly, even conditional on survival for three years. The typical surviving firm at the end of Year T+3 continues to report poor operating results, face serious going-concern uncertainty, and are highly illiquid. However, we find little evidence that RM firms are inherently riskier than other public firms that already trade on the same exchange venue. In fact, RMs outperformed their matched CLs in terms of improvement in market liquidity over time. These results suggest that the disappointing performance of reverse merger firms is, in fact, typical of other publicly listed firms that trade on the OTC markets.

Chinese RMs vs. U.S. RMs

Panel B of Table 4 reports the comparison between Chinese RMs and U.S. RMs on the same performance metrics employed in Panel A. As in Panel A, we require that both RMs and their matched CLs survive to the end of Year T+3.²⁴ The results show that although the sample selection is biased in favor of U.S. RMs, Chinese RMs still strongly dominate their U.S. peers in every performance metric. On average, Chinese RMs are profitable and generate positive operating cash flows in each of the three years except for Year T+3, where the mean ROA for Chinese RMs is -0.02. In contrast, the average U.S. RM consistently generates significant losses and negative CFO over the same period. The difference

²⁴ We perform the same analysis without requiring surviving matched CLs. The results are more in favor of Chinese RMs.

between the two groups is highly significant at 1% level.

The median ROA of the U.S. RMs is consistently around -0.60. Hence, a typical U.S. RM firm that is still alive at its three-year anniversary date loses approximately 60% of its total assets in each of the three years. The magnitude of these losses is staggering, and would be quite unusual for more established enterprises. However, they are less surprising once we recognize the fact that most firms traded on the OTC markets are early-stage entrepreneurial ventures. Indeed, we manually checked a number of data points to ensure the results are not caused by errors.

For illustration, Appendix C presents two case studies: Tree Top Industries, Inc. (TTII) and SiriCOMM, Inc. (SIRC). TTII's total assets are negligible compared to its loss. For example, in Year T+3, TTII reported a \$27 million loss, while the beginning and ending balances of its total assets are \$75,000 and \$220,000, respectively. TTII can continue to make substantial losses on a small asset base because the company issues more equity in exchange for services. SIRC employs a similar strategy. Since its inception, SIRC had financed its activities primarily from short term loans and the placement of private equity. In short, most of these firms subsist from year-to-year due to a constant infusion of new capital (or services-in-kind). Not surprisingly, many RMs have audit opinions with "going-concern" qualifications – Panel B of Table 4 shows that, by the end of Year T+3, 52% of the U.S. RMs have audit qualifications, compared to 34% of the Chinese RMs.

Another measure of market-based performance is the relative bid-ask spread of each firm. Over the three-year horizon, Chinese RMs continue improving their market liquidity with mean SPREAD reducing from 15.80% in Year T+1 to 11.99% in Year T+3 and median SPREAD showing an even bigger improvement. Over the same time horizon, the market

liquidity of U.S. RMs deteriorates, with mean SPREAD increasing from 10.46% in Year T+1 to 18.50% in Year T+3.

In short, the results in Panel B of Table 4 show that Chinese RMs have significantly stronger performance than their U.S. peers over the next three years, even if we focus on the surviving firms (i.e., bias the sample selection in favor of U.S. RMs). Across a wide range of performance metrics, we find no evidence that Chinese RMs are systematically riskier. It appears that the recent problems in some Chinese RMs derive more from the inherent risks associated with RMs as a group, rather than from their country of origin.

Difference-in-difference analysis

As shown in Panel B of Table 2 and Panel C of Table 3, Chinese RMs are generally larger in terms of market capitalization and are more likely to trade on OTCBB than their U.S. peers. To eliminate the effects of firm size, exchange venue, time, and industry on performance, we employ a difference-in-difference approach (DID) to compare future performance between Chinese RMs and U.S. RMs. The sample for this test is the same as the sample in Panel B of Table 4, which consists of 68 Chinese RMs and 96 U.S. RMs with matched CLs that have non-missing financial data from Year T+1 to Year T+3. For each performance metric, the value of the CLs is subtracted from the value of the RMs.

Table 5 reports multiple comparisons. The first (second) column under each year reports the summary statistics of the paired difference between Chinese (U.S.) RMs and their Exchange-Industry-Size-Date matched controls. A positive (negative) number indicates that the value of the RMs is higher (lower) than the value of the CLs. The third column under each year reports the difference between the first and the second columns (i.e., the DID). A

positive (negative) number in the third column indicates that the value of the Chinese RMs is higher (lower) than the value of the U.S. RMs after controlling for the effects of size, exchange venue, industry, and time.

Table 5 shows Chinese RMs have significantly higher ROA and CFO than their CLs in each of the three years. For example, the mean of the paired difference in ROA between Chinese RMs and CLs is 0.80, 0.68, and 1.00 in Year T+1, T+2, and T+3, respectively. All of these differences are significant at 1% level. Chinese RMs have fewer firms receiving qualified audit opinion (AUQ) than their CLs in all three years. However, the difference is not statistically significant in Year T+3. In terms of market liquidity, Chinese RMs are less liquid than their CLs in year T+1, but become more liquid than their CLs by Year T+2 and T+3. The difference is significant at 5% level in Year T+3.

In contrast to the Chinese RMs, U.S. RMs generally have lower ROA and CFO than their CLs. U.S. RMs are comparable to their CLs in terms of the percentage of firms receiving qualified audit opinion. U.S. RMs are less liquid than their CLs in all three years. However, the difference is not statistically significant in Year T+3.

The DID comparison shows that Chinese RMs have significantly higher ROA and CFO than their U.S. peers after eliminating the effects of size, exchange venue, industry, and time. Chinese RMs are less likely to receive qualified audit opinion than U.S. RMs although the difference is not significant in Year T+3. Finally, Chinese RMs become more liquid than U.S. RMs over time.

Overall, the results of the DID analysis are consistent with the results in Panel B of Table 4. There is little evidence that Chinese RMs are systematically riskier, or more problematic than their U.S. peers after taking into account the confounding effects of size, exchange

venue, industry, and time.

IV. 4. Comparison of future returns

Annual buy-hold raw returns

Next, we compare future stock returns realized by the RMs and by their control firms. We caution that due to the low stock prices prevalent in all these samples, return calculations are extremely noisy, and comparisons of actual returns may not be as meaningful as other performance metrics which are already reported. Nevertheless, it seems important to understand how investors in the US and Chinese RMs would have fared relative to those in the control sample.

Panel A of Table 6 presents the comparison of the return distributions between Chinese RMs and U.S. RMs.²⁵ The return distributions of both Chinese RMs and U.S. RMs exhibit great positive skewness and large variance. For example, in Year T+1 the 95th percentile of the annual buy-hold return distribution is 349% for Chinese RMs and 236% for U.S. RMs, respectively. The interquartile range is 133% for Chinese RMs and 70% for U.S. RMs. On average, Chinese RMs earned 47% while U.S. RMs earned 8% in Year T+1. The difference in mean between the two samples is statistically significant at 10% level (t-stat = 1.66). The median annual return is -8% for Chinese RMs as compared to -46% for U.S. RMs. The Wilcoxon z-statistic is 3.62, which strongly rejects the null hypothesis that the two distributions are identical. The probability that a random draw from Chinese RMs is higher than a random draw from U.S. RMs is 0.92 (untabulated), indicating that Chinese RMs

²⁵ We use the Long-run Sample for the tests in Table 6 and Table 7 and adjust returns for delisting and acquisition. We also perform robustness tests using the sample conditional on survival over the next three years and obtain similar results.

collectively have higher stock returns in Year T+1 than U.S. RMs.

The results in Years T+2 and T+3 are similar. In Year T+2, the mean annual returns are 25% and -6% for Chinese RMs and U.S. RMs, respectively, with the difference significant at 10% level (t-stat = 1.67). The median returns are -9% and -50% for Chinese RMs and U.S. RMs, respectively. The Wilcoxon z-statistic is 3.13 and the probability that a randomly chosen observation from Chinese RMs is higher than a randomly chosen observation from U.S. RMs is 0.91 (untabulated). In Year T+3, although Chinese RMs still report higher mean returns than U.S. RMs, the difference is not statistically significant.

Finally, we report the three-year cumulative returns for the two groups. Over the three-year horizon, Chinese RMs on average lose 16% of shareholders' value, while U.S. RMs on average lose 28%. The median three-year cumulative returns are -49% and -84% for Chinese and U.S. RMs, respectively, with the difference significant at 1% level (z-stat = 3.90). Overall, the results in Panel A of Table 6 show that both Chinese and U.S. RMs lose a significant portion of investors' value over the three years after the first 10-K filing. However, Chinese RMs collectively report higher stock returns than U.S. RMs.

Annual returns adjusted for the RM's domicile country market index return

A potential concern of the results in Panel A is that the stronger market performance of Chinese RMs stems from the booming Chinese economy over the sample period.²⁶ To examine this possibility, we compare the two RM samples using returns adjusted for the RM's domicile country market index return: the China A-share index return for Chinese RMs

²⁶ According to Yahoo Finance, the China A-share market index increased by 32.13% from 2001 to 2010. In contrast, the S&P 500 index dropped by 3.14% over the same period.

and the S&P 500 index return for U.S. RMs. The results are reported in Panel B of Table 6. In general, the market adjustment indeed has bigger impact on Chinese RMs than U.S. RMs. However, in all three years, Chinese RMs collectively report higher market-adjusted returns than U.S. RMs, significantly so for Years T+1 and T+2. Overall, the results in Panel B of Table 6 indicate that the superior market performance of Chinese RMs is not driven entirely by the booming Chinese economy.

Difference-in-difference analysis of stock returns

Finally, we also use the DID approach to eliminate the confounding effects of size, exchange venue, time, and industry on stock returns. Table 7 reports the summary statistics of the paired differences in future stock returns between RMs and CLs for the full sample (RM-CL), the Chinese subsample (CN-CL), and the U.S. subsample (US-CL).

We first test the statistical significance of the paired differences. In Year T+1, the mean of the paired difference in the full sample is 19% and the median is -8%. Neither of these two values is significantly different from zero. In the Chinese subsample, the mean of the paired difference is 25% and the median is 16%. The median is different from zero at 10% level, suggesting that Chinese RMs collectively earn higher returns than their control firms in Year T+1. In the U.S. subsample, the mean of the paired difference is 15% and statistically insignificant. The median of the paired difference is -22%, which is statistically significant at 5% level. The results suggest that U.S. RMs as a group consistently earn lower returns than their control firms in Year T+1. The DID analysis shows that the difference in mean returns between the two RM samples is not statistically significant, while the difference in median returns is significant at 5% level. The results suggest that after controlling for the

effects of size, exchange venue, time, and industry, Chinese RMs as a group still consistently earn higher returns than U.S. RMs.

In Year T+2, RMs outperform CLs in both the full sample and the Chinese subsample as indicated by the statistically significant mean of the paired differences. In the U.S. subsample, however, RMs earn comparable returns as CLs. The DID analysis shows that the returns of the Chinese RMs and the U.S. RMs are indistinguishable in Year T+2. In Year T+3, RMs underperform CLs in all three samples as indicated by the significantly negative median of the paired difference. However, the DID results show that the two RM subsamples are effectively indistinguishable from each other.

Finally, we report the cumulative returns over the three-year horizon. These results show that in terms of their three-year cumulative returns, the RM sample and the CL sample are not significantly different from each other. The same is true of the comparison between Chinese RMs and their matched control firms. However, over the three-year horizon, U.S. RMs significantly underperform their control firms, as indicated by the negative and statistically significant median of the paired differences. The DID results show that over a three-year horizon Chinese RMs consistently earn higher returns than their U.S. peers.

Overall, the results in Table 7 show that after controlling for the effects of size, exchange venue, time, and industry, Chinese RMs as a group still earn higher returns than U.S. RMs over the three years after the initial 10-K filing (especially in Year T+1). Once again, we find little evidence in market performance to support the notion that Chinese RMs are systematically riskier, or more problematic.

IV. 5. Snapshot at the end of 2011

In early June 2011, the SEC warned investors against investing in firms listing via reverse mergers. In the same year, over 20 U.S. listed Chinese companies were either delisted or halted from trading, while a number of others had auditor changes or were the target of high-profile short-sellers. In Appendix A, we report 32 Chinese reverse mergers identified as fraudulent by the media, short sellers or the SEC since 2010. Our sample includes 26 of these firms.

As shown in Appendix A, a vast majority of these fraud firms were demoted to Pink Sheet by the end of 2011. In the aftermath of these scandals, Chinese reverse mergers, as a group, were put under the spotlight, and heavily scrutinized by investors, stock exchanges and regulators. During this process, all U.S. listed Chinese companies, including non-fraudulent RMs and IPOs, suffered for the sins of the few, while U.S. RMs and RMs from other countries were largely spared (see DHZ). As a robustness test, we imposed the maximum penalty on RMs, particularly Chinese RMs, by examining their survival rate at the end of 2011 and their cumulative stock returns from the inception (Year T) to the end of 2011. We use our Inception Sample for this test and the results are reported in Table 8.

Panel A of Table 8 presents the distribution by exchange venue of the RMs and CLs in Year T and at the end of 2011. Although RMs and CLs start off on the same exchange venues, RMs are more likely to trade on NYSE/AMEX or NASDAQ (24.3% vs. 16.5%) and less likely to be acquired (3.1% vs. 6.8%) than their counterparts as of the end of 2011. In both groups, about 38% of the firms are quoted on Pink Sheet and 10% of the firms disappear from public sight due to bankruptcy by the end of 2011. Note that while a majority of firms in both groups are either defunct or languishing in the Pink Sheets by the end of 2011, the

reverse mergers actually outperformed their matched controls in terms of upward mobility.

The comparison between Chinese RMs and their controls is strikingly different from the results of the full RM sample. Although over 90% of Chinese RMs began their public lives on the OTCBB, 42.5% are trading on one of the National Market Systems venues as of the end of 2011. This is significantly higher than the 15.8% in control group. Despite the fact that most of the fraudulent Chinese RMs are already demoted to Pink Sheet by the end of 2011, the overall proportion of Pink Sheet firms for Chinese RMs (34.2%) is actually lower than for the control group (36.3%). Moreover, only 1.4% of Chinese RMs are actually defunct by the end of 2011, compared to 6.8% in control group. Overall, these results show that Chinese RMs significantly outperformed their control firms in terms of survival rate and upward mobility, even after the maelstrom of 2011.

For reference, we also compared U.S. RMs with their controls. Our results show the two groups had similar survival rates. As of the end of 2011, approximately 16% of the firms in each group are traded on NYSE/AMEX or NASDAQ, and about 40% of the firms are quoted on Pink Sheet. The only significant difference between U.S. RMs and their control firms is that U.S. RMs are less likely to be acquired.

In Panel B of Table 8, we compare the cumulative stock returns of RMs and CLs from inception to the end of 2011. The paired differences between RMs and CLs have a positive yet insignificant mean of 26%. The median of the paired differences is -2% and is statistically significant at 5% level, suggesting that RMs underperform CLs in terms of creating value for the shareholders. However, a closer look shows that the underperformance is mainly due to U.S. RMs. The mean and median of the paired differences between Chinese RMs and CLs are 61% and -1%, respectively, with neither

statistic being significantly different from zero. Despite suffering from extremely negative public sentiment, collectively Chinese RMs still generated comparable stock returns as their counterparts. In contrast, although they largely escaped investors' wrath in 2011, U.S. RMs still significantly underperformed their control firms.

The results in Table 8 reinforce the evidence from prior tests: in sum, we find no evidence that Chinese RM firms are systematically riskier, or more problematic, than other similarly sized publicly-listed firms from the same industry and exchange venue.

V. Summary

In this study, we examine the financial health and subsequent performance of reverse mergers (RMs) that became active on U.S. stock markets between 2001 and 2010, particularly those from China (around 85% of all non-domestic RMs). Our analysis is motivated by a need to distinguish between: (1) problems that are common to all RMs, and (2) problems that plague Chinese RMs in particular. This distinction is important because prior studies consistently find sharp differences between IPO firms and RM firms.

Prior studies that examine the aftermarket performance of RMs have generally compared them to IPOs. Although IPO and RM are sometimes portrayed as alternative ways for a private firm to go public, in fact a majority of RM firms were never IPO-eligible. Whereas most IPOs begin their lives in one of the National Market System venues (NYSE, AMEX, or NASDAQ), most RMs begin trading on the OTC Bulletin Board (OTCBB) or as "Pink Sheet" stocks. Therefore, IPO firms are not an ideal benchmark by which to evaluate the aftermarket performance of RM firms.

By identifying a population of control firms that more closely mirror their ex-ante risk attributes, we provide striking new evidence on the aftermarket performance of RMs. Specifically, we employ an algorithm that pairs each RM with a control firm matched on Exchange (the listing venue), Industry (48 industry classifications in Fama and French (1997)), Date (of the RM's first 10-K filing), and Size (the market capitalization). We then compare various financial health and performance metrics for these two samples at the reporting date of the RM's initial 10-K filing and at each of the next three anniversary dates.

Our results show that RMs tend to be small, financially-constrained, and illiquid stocks that are highly prone to default and/or bankruptcy risk. However, the same is true of their matched control firms. In terms of overall cash flow, profitability, leverage, likelihood of receiving a going-concern audit qualification, and proclivity to default over the next three years, the RMs are not distinguishable from other matched firms on the same exchange venue. In fact, over the next three years, RMs are more likely to move up in exchange tier or be acquired than their matched control firms (31.3% versus 19.6%), and are less likely to move down or be defunct (25.3% versus 30.1%). Overall, we find little evidence that RMs are collectively riskier or more problematic than the control firms.

When we split the sample of RMs between U.S. and China, we find that U.S. RMs generally underperform their control firms, while Chinese RMs generally outperform. Chinese RMs are healthier than the U.S. RMs from Day 1 (they are larger, less levered, more profitable, less likely to have a qualified audit opinion). Over the next three years, the two groups diverge even further in terms of performance. While most (55.1%) of the Chinese RMs either move up in exchange tier or are acquired, only a minority (19.7%) of the U.S. RMs do so. The Chinese RMs also outperform the U.S. RMs in each of the next three years

in terms of their profitability, cash flows, likelihood of receiving a qualified audit opinion, and change in market liquidity. These improvements are also reflected in future market returns, as Chinese RMs generally outperform their control firms, while U.S. RMs underperform, over the next three years. We show that most of this return difference is not attributable to differences in exposure to the Chinese stock market.

Overall, we contribute to the general literature on reverse mergers by showing that, given proper matching to a set of comparable publicly-listed firms from the same exchange venue, RM firms do not in fact underperform other companies. While RM firms are speculative in nature and are prone to bankruptcy, these problems are endemic to the markets in which RMs reside, and are not issues specific to RMs. Our results do not support the view that current RM listing requirements are “too loose”.

We also help to put into perspective concerns with Chinese firms that recently listed in the U.S. While legitimate issues remain with the structural integrity of corporate governance and internal control of Chinese firms, our evidence indicates that the current Sino-phobic reaction to Chinese reverse mergers may be overblown. Using a wide range of performance metrics, we find that Chinese RMs are healthier from Day 1, and continue to fare better over the next three years, whether we compare them to their own matched control firms or to their U.S. RM counterparts.

Extending our results to the end of 2011, we show that even after the recent maelstrom, Chinese RM firms still fared better on virtually all dimensions than either their control group, or their U.S. counterparts. These results hold despite the fact that our sample includes most Chinese RM firms accused of fraud since 2010. Once again, these results do not support the view that Chinese RM firms are collectively exploiting a significant loophole in U.S. listing

regulations.

In short, recent bad press notwithstanding, we find virtually no evidence that Chinese RMs are systematically riskier, or more problematic, than other comparable U.S. listed firms from the same industry and exchange listing.

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Appendix A. Chinese reverse mergers identified as fraudulent by the media, short sellers or the SEC since 2010

Name	Date of reverse merger	Last exchange prior to citation/report	Date of trading halt	Added to Pink Sheet	Delisted (Form 25)	Registration revoked by the SEC	In sample?
Advanced Battery Technologies, Inc.	2004/04/21	NASDAQ	2011/11/15	2011/11/30	2011/12/16	-	Yes
A-Power Energy Generation Systems, Ltd.	2007/02/09	NASDAQ	2011/06/27	2011/09/26	2012/04/13	-	No ^a
China Agritech, Inc.	2005/02/03	NASDAQ	2011/03/14	2011/05/20	2011/07/13	2012/10/17	Yes
China Integrated Energy, Inc.	2007/10/23	NASDAQ	2011/04/20	2011/06/15	2011/11/10	-	Yes
China Century Dragon Media, Inc.	2010/04/30	AMEX	2011/03/21	2011/06/17	2011/10/07	-	Yes
China Changjiang Mining & New Energy Company, Ltd.	2008/02/04	OTCBB	-	2011/04/07	-	-	Yes
China Education Alliance, Inc.	2004/12/13	NYSE	2011/12/21	2011/12/29	2012/01/11	-	Yes
China Electric Motor, Inc.	2009/05/06	NASDAQ	2011/03/31	2011/06/14	2011/10/06	-	Yes
China Green Agriculture, Inc.	2007/12/26	NYSE	- ^d	-	-	-	Yes
China Intelligent Lighting and Electronics, Inc.	2010/01/15	AMEX	2011/03/24	2011/06/17	2011/07/19	-	Yes
China Marine Food Group	2007/11/23	AMEX	- ^e	-	-	-	Yes
China MediaExpress Holdings, Inc.	2009/10/15	NASDAQ	2011/03/11	2011/05/19	2011/12/16	2012/08/28	No ^a
China North East Petroleum Holdings Limited	2004/03/29	AMEX	2012/03/01	2012/06/21	2012/07/06	-	No ^a
China Ritar Power Corp.	2007/02/16	NASDAQ	2011/04/18	2011/06/23	2011/07/05	-	Yes
China Valves Technology, Inc.	2007/12/18	NASDAQ	2012/07/13	2012/09/21	2012/09/21	-	Yes
China-Biotics, Inc.	2006/03/23	NASDAQ	2011/06/15	2011/07/01	2011/07/11	-	Yes
CleanTech Innovations, Inc.	2010/07/02	NASDAQ	2011/03/02	2011/03/02	2011/12/16	-	Yes
Duoyuan Printing, Inc.	2006/10/06	NYSE	2011/04/01	2011/04/04	2011/10/06	-	Yes
Fuqi International, Inc.	2006/11/20	NASDAQ	2011/03/29	2011/03/29	2011/06/03	-	No ^a
Heli Electronics Corp.	2010/06/15	OTCBB	-	2011/03/25	-	2012/03/02	No ^b
Jiangbo Pharmaceuticals, Inc.	2007/10/01	NASDAQ	2011/05/31	2011/08/04	2011/10/06	-	Yes
Keyuan Petrochemicals, Inc.	2010/04/22	NASDAQ	2011/04/01	2011/10/07	2012/04/13	-	Yes

Appendix A continued

Name	Date of reverse merger	Last exchange prior to citation/report	Date of trading halt	Added to Pink Sheet	Delisted (Form 25)	Registration revoked by the SEC	In sample?
Nivs Intellimedia Technology Group, Inc.	2008/07/25	AMEX	2011/03/24	2011/06/23	2011/07/19	-	Yes
Orient Paper, Inc.	2007/10/30	AMEX	^f	-	-	-	Yes
Puda Coal, Inc.	2005/07/15	AMEX	2011/04/11	2011/08/18	2011/09/12	-	Yes
RINO International Corp.	2007/10/05	NASDAQ	2010/11/17	2010/12/08	2010/12/20	-	Yes
ShengdaTech, Inc.	2006/03/31	NASDAQ	2011/03/15	2011/06/10	2011/12/16	-	Yes
Sino Clean Energy Inc.	2006/10/18	NASDAQ	2012/05/21	2012/09/25	-	-	Yes
Subaye, Inc.	12/21/2000	NASDAQ	2011/04/07	2011/06/24	2011/11/10	-	No ^c
Universal Travel Group	2006/07/12	NYSE	2011/04/11	2012/05/07	2012/04/26	-	Yes
Wonder Auto Technology, Inc	2006/06/22	NASDAQ	2011/05/06	2011/09/12	2012/01/06	-	Yes
Yuhe International, Inc.	2008/03/12	NASDAQ	2011/06/17	2011/07/21	2011/12/16	-	Yes

^a The observation was missing in the original DealFlow Media's reverse merger report.

^b The financial data was missing from COMPUSTAT.

^c The reverse merger was completed prior to 2001, the starting year of our sample period.

^d China Green Agriculture was the target of J Capital Research's report on January 5, 2011, "Why We're Short China Green Agriculture (CGA)". The SEC launched investigations into the company's disclosure practices. The company's stock was still traded on NYSE at the time of writing.

^e China Marine Food Group was under pressure from short sellers several times throughout 2010, who identified that the company's financial statements filed with the Chinese State Administration for Industry and Commerce ("SAIC") differed substantially from the financial statements filed with the SEC. The company's stock was still traded on NYSEAMEX at the time of writing.

^f Muddy Waters Research initiated "Strong Sell" coverage on Orient Paper on June 28, 2010, alleging that "We are confident that ONP is a fraud. Its purpose is to raise and misappropriate tens of millions of dollars." The company's stock is still trading on the NYSE/AMEX as of the time of this writing.

Appendix B. Examples of audit reports

Audit Committee, Board of Directors and Stockholders
SiriCOMM, Inc.
Joplin, Missouri

We have audited the accompanying consolidated balance sheets of SiriCOMM, Inc. as of September 30, 2006 and 2005, and the related consolidated statements of operations, stockholders' equity and cash flows for each of the two years in the period ended September 30, 2006. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with the standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the consolidated financial statements referred to above present fairly, in all material respects, the financial position of SiriCOMM, Inc. as of September 30, 2006 and 2005, and the results of its operations and its cash flows for each of the two years in the period ended September 30, 2006, in conformity with accounting principles generally accepted in the United States of America.

As discussed in Note 14, the Company changed its method of accounting for conditional asset retirement obligations in 2006.

The accompanying financial statements have been prepared assuming the Company will continue as a going concern. As discussed in Note 2, the Company has suffered recurring losses and negative operating cash flows which raise substantial doubt about its ability to continue as a going concern. Management's plans in regard to these matters are also described in Note 2. The financial statements do not include any adjustments that might result from the outcome of this uncertainty.

/s/
BKD, LLP

Joplin, Missouri
November 17, 2006

Appendix B continued

To the Board of Directors and Stockholders of
Tree Top Industries, Inc.
(A Development Stage Company)

We have audited the accompanying balance sheets of Tree Top Industries, Inc.(A Development Stage Company) as of December 31, 2010 and 2009, and the related statements of operations, stockholders' equity (deficit), and cash flows for the years then ended. The financial statements for the period from inception (August 1, 2007) to December 31, 2008, were audited by other auditors whose report expressed an unqualified opinion on those statements. These financial statements are the responsibility of the Company's management. Our responsibility is to express an opinion on these financial statements based on our audits.

We conducted our audits in accordance with standards of the Public Company Accounting Oversight Board (United States). Those standards require that we plan and perform the audits to obtain reasonable assurance about whether the financial statements are free of material misstatement. The Company is not required to have, nor were we engaged to perform, an audit of its internal control over financial reporting. Our audits included consideration of internal control over financial reporting as a basis for designing audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Company's internal control over financial reporting. Accordingly, we express no such opinion. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the financial statements referred to above present fairly, in all material respects, the financial position of Tree Top Industries, Inc. (A Development Stage Company) as of December 31, 2010 and 2009, and the results of its operations and cash flows for the periods described above, in conformity with accounting principles generally accepted in the United States of America.

The accompanying financial statements have been prepared assuming that Tree Top Industries, Inc. will continue as a going concern. As discussed in Note 1 to the financial statements, Tree Top Industries, Inc. has suffered recurring losses from operations, has a working capital deficit and is dependent of financing to continue operations. These issues raise substantial doubt about the company's ability to continue as a going concern. Management's plans in regard to these matters are also described in Note 1. The financial statements do not include any adjustments that might result from the outcome of this uncertainty.

Appendix B continued

As discussed in Note 12 to the financial statements, the Company has restated its financial statements as of and for the year ended December 31, 2009 to correct errors in its accounting for stock based compensation and valuation of notes receivable.

/s/ M&K CPAS, PLLC
www.mkacpas.com
Houston, Texas
April 14, 2011

Appendix C. Case studies of extreme return on assets

Tree Top Industries Inc. (TTII)

TTII completed reverse merger with Ludicrous Inc. (private company) on November 1, 2007 and filed its first post-RM 10-K for December 31, 2007 (Year T). The following financial data are collected from COMPUSTAT and are verified with the firm's 10-K.

Year	Fiscal Year End	Value in 10-K					Value after winsorization	
		AT	IB	OANCF	ROA	CFO	ROA	CFO
T	12/31/2007	0.527	-5.657	-0.698	-10.734	-1.324	-10.734	-1.324
T+1	12/31/2008	0.140	-4.141	-1.233	-29.579	-8.807	-14.167	-6.650
T+2	12/31/2009	0.220	-61.474	-1.055	-279.427	-4.795	-15.044	-4.795
T+3	12/31/2010	0.075	-27.116	-0.514	-361.547	-6.853	-13.912	-5.285

AT, total assets; IB, income before extraordinary items; OANCF, operating activities net cash flow; ROA = IB/AT; CFO = OANCF/AT.

TTII's total assets are negligible compared to its loss. TTII can continue making substantial loss on a small asset base because the company issues more equity in exchange for services, indicated by the Statement of Shareholders' Equity (excerpted from TTII's 2010 10-K):

	Common Stock		Additional	Unearned	Accumulated	Total
	Shares	Amount	Paid-In Capital	ESOP Shares	Deficit	Equity
Balance, December 31, 2009 (Restated)	127,494,100	\$127,494	\$ 112,325,087	-	\$ (114,743,378)	\$ (2,290,797)
Stock options granted for services	-	-	8,024,977	-	-	8,024,977
Valuation of stock option re-pricing	-	-	153,965	-	-	153,965
Common stock issued for services	123,485,000	123,485	17,121,310	-	-	17,244,795
Common stock issued for cash	220,000	220	1,980	-	-	2,200
Stock based compensation earned	-	-	213,910	-	-	213,910
Imputed interest - loan	-	-	12,446	-	-	12,446
Contribution from shareholders	-	-	50,375	-	-	50,375
Common stock issued to ESOP	20,000,000	20,000	1,080,000	(1,100,000)	-	-
Net loss for the year ended December 31, 2010	-	-	-	-	(27,115,709)	(27,115,709)
Balance, December 31, 2010	271,199,100	\$271,199	\$ 138,984,050	\$ (1,100,000)	\$ (141,859,087)	\$ (3,703,838)

Appendix C continued

SiriCOMM, Inc. (SIRC)

On November 21, 2002, Fountain Pharmaceuticals, Inc. completed the reverse merger with SiriCOMM, Inc. (private company) and changed its name to SiriCOMM, Inc. The company filed its first post-RM 10-K for September 30, 2003 (Year T). The following financial data are collected from COMPUSTAT and are verified with the firm's 10-K.

Year	Fiscal Year End	Value in 10-K					Value after winsorization	
		AT	IB	OANCF	ROA	CFO	ROA	CFO
T	9/30/2003	0.932	-2.126	-0.640	-2.281	-0.687	-2.281	-0.687
T+1	9/30/2004	1.752	-2.778	-1.190	-1.586	-0.679	-1.586	-0.679
T+2	9/30/2005	5.702	-3.240	-1.952	-0.568	-0.342	-0.568	-0.342
T+3	9/30/2006	5.073	-7.193	-2.693	-1.418	-0.531	-1.418	-0.531

AT, total assets; IB, income before extraordinary items; OANCF, operating activities net cash flow; ROA = IB/AT; CFO = OANCF/AT.

Since its inception, SIRC had financed its activities primarily from short term loans and the placement of private equity. Below is an excerpt of the financing activities from the company's cash flow statement.

	<u>2006</u>	<u>2005</u>
Financing Activities		
Borrowings under line of credit, net	(407,346)	285,346
Repayments of notes payable	-	(25,000)
Proceeds from related party note	500,000	-
Purchase of treasury stock	(90,000)	-
Proceeds from exercise of stock options and warrants	81,614	206,800
Proceeds from issuance of warrants	-	56,666
Proceeds from sale of common stock	4,488,215	2,448,371
Net cash flows provided by financing activities	<u>4,572,483</u>	<u>2,972,183</u>

Figure 1. Key stages in a reverse merger

This figure depicts the three stages in the formation of a reverse merger (RM) firm, as well as the number of firms in the DealFlow Media database at each stage. Stage 1 is the formation of a Shell Company. Stage 2 is the completion of a RM transaction, defined as the acquisition of a shell company by another corporate entity. Stage 3 is the filing of the first 10-K form by a firm identified earlier as a RM.

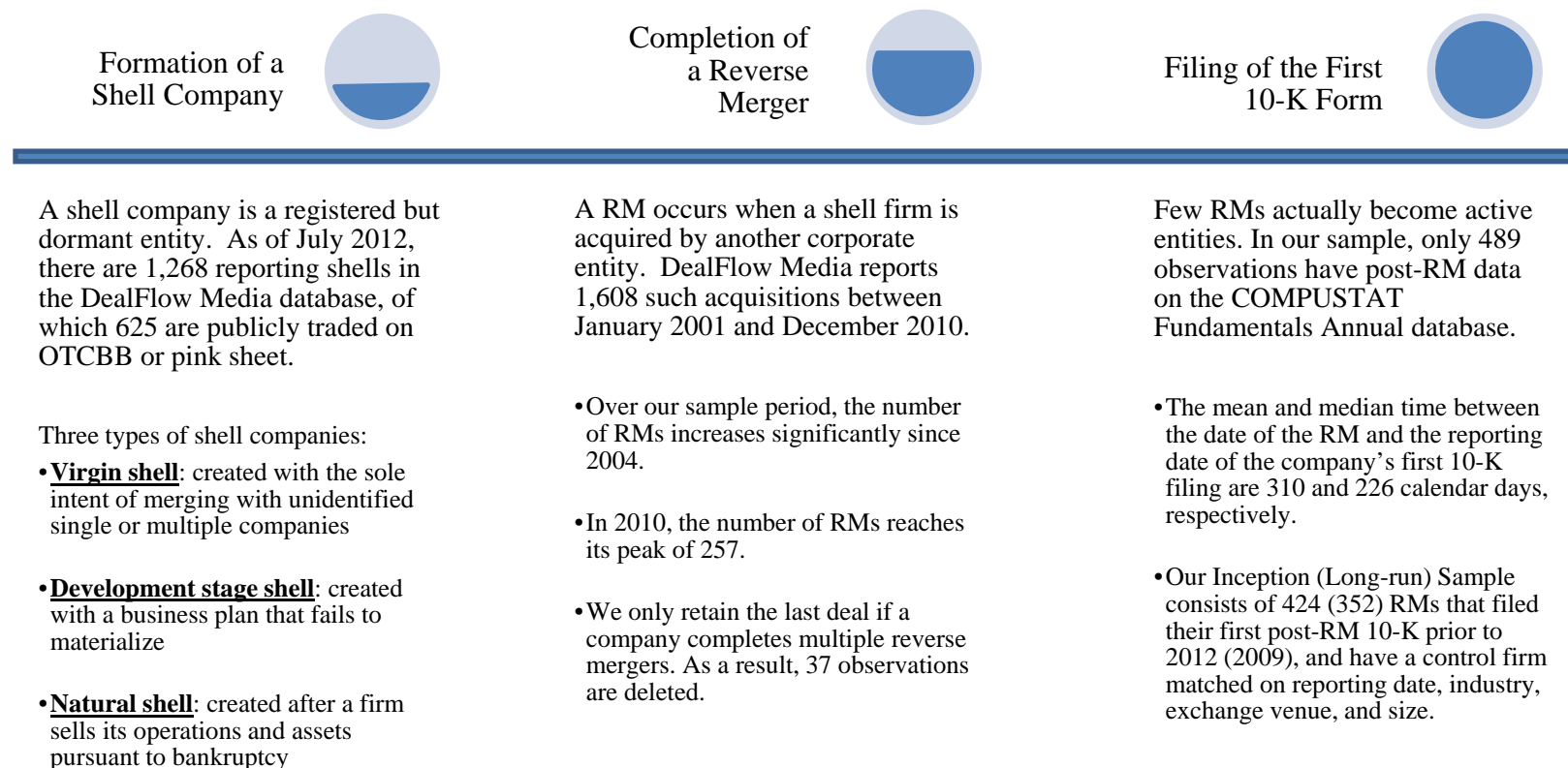
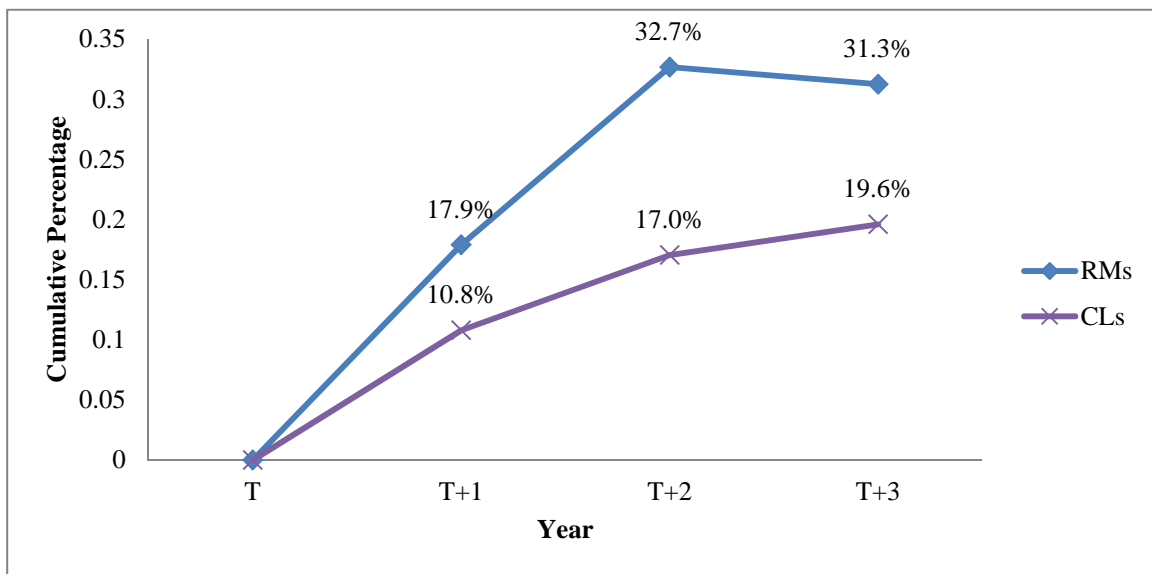


Figure 2. Changes in exchange venue for reverse mergers and control firms

These figures depict the cumulative directional change in exchange listing for reverse mergers (RMs) and control firms (CLs) in the three years after the RM’s first 10-K filing. Year T is the year that each RM filed its first 10-K. For every RM firm, we identify all firms from the same industry and exchange venue that also filed a 10-K in Year T. We then define the matched control as the firm with a market value of equity closest to the RM firm as of the end of year T. To assess the results at the RMs’ three-year anniversary dates, we use the pre-2009 RMs and their matched controls (firms in our “Long-run sample”). Panel A presents the proportion of firms that moved up in terms of their exchange tier (e.g., from Pink Sheet to OTCBB, or from OTCBB to NMS), or were acquired. Panel B presents the proportion of firms that moved down, or were defunct.

Panel A: Proportion of firms that moved up or were acquired



Panel B: Proportion of firms that moved down or were defunct

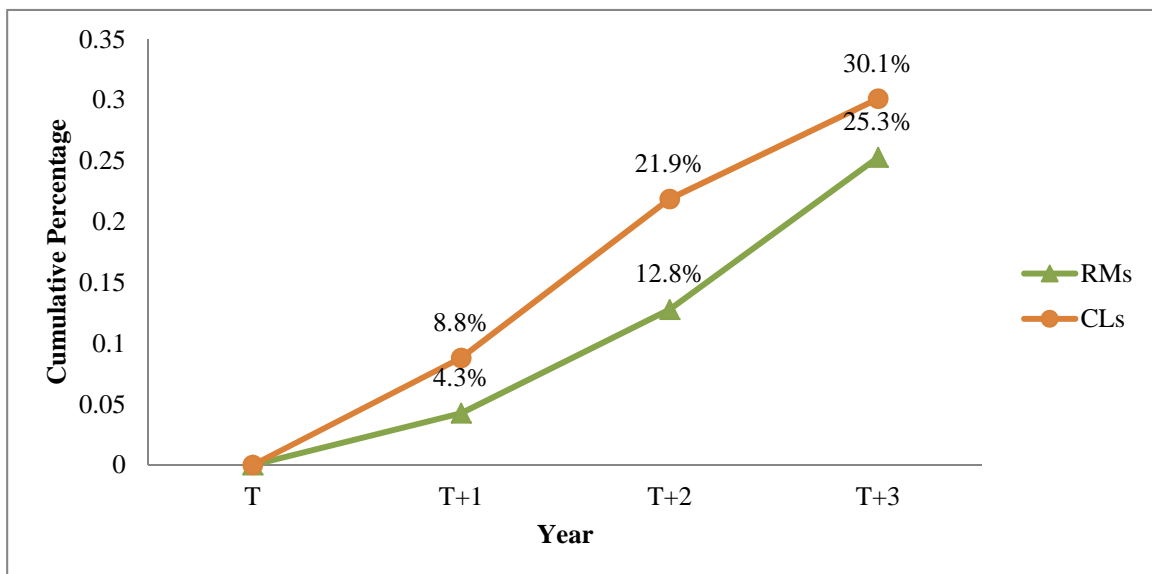
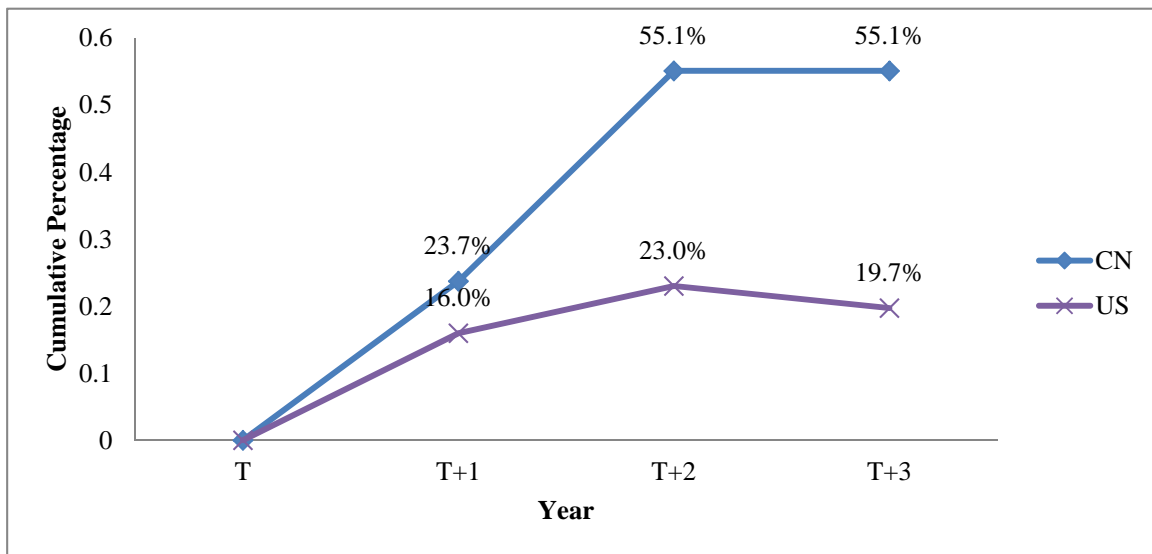


Figure 3. Changes in exchange venue for Chinese versus U.S. reverse mergers

These figures depict the cumulative directional change in exchange venue for Chinese reverse mergers (CN RMs) and U.S. reverse mergers (U.S. RMs). To assess the results at the RMs' three-year anniversary dates, we use the pre-2009 RMs (firms in our "Long-run sample"), which include 118 CN RMs and 213 U.S. RMs. Year T is the year that each RM filed its first post-RM 10-K. Panel A presents the proportion of firms that moved up in terms of their exchange tiers (e.g., from Pink Sheet to OTCBB, or from OTCBB to NMS), or were acquired. Panel B presents the proportion of firms that moved down, or were defunct.

Panel A: Proportion of firms that moved up or were acquired



Panel B: Proportion of firms that moved down or were defunct

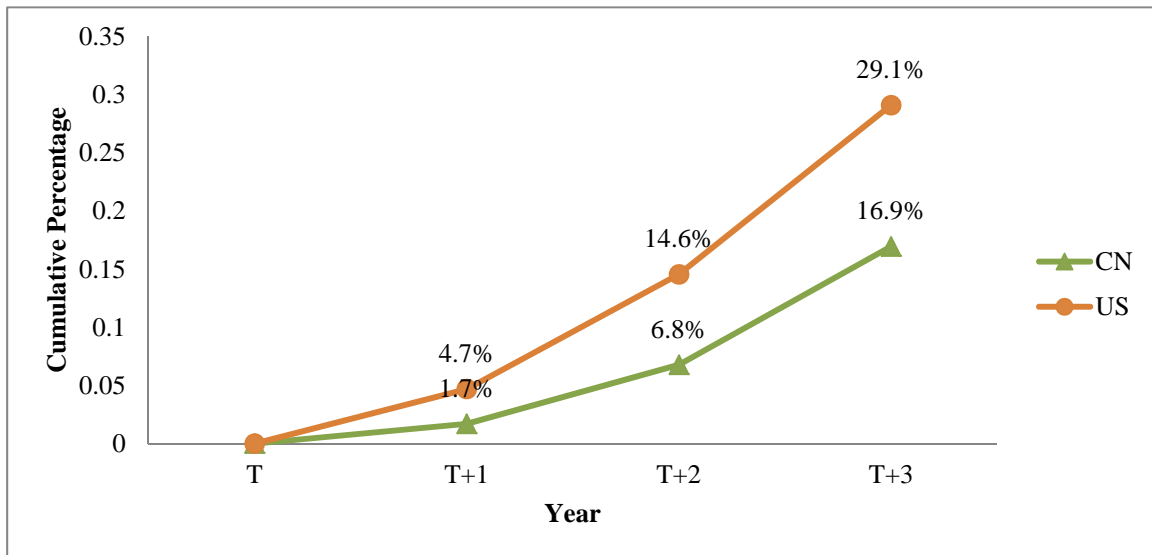


Table 1. Sample description

This table provides an overview of the number of reverse mergers (RMs) in our samples, distributed by country of origin (Panel A) and by year of merger (Panel B). Our samples consist of all U.S. listed RMs since 2001 from DealFlow Media’s (DFM) Reverse Merger Report that filed their first post-RM 10-K prior to 2012 (the “Inception Sample”) or 2009 (the “Long-run Sample”), and have a control firm matched on reporting date, industry, exchange venue, and size. Country classification is based on the location of the main operations of the private firm in a RM. Days2Filing refers to the average number of calendar days between the merger date and the reporting date of the firm’s first post-RM 10-K filing.

Panel A: Distribution of reverse merger firms by country

	Inception Sample (Prior to 2012)		Long-run Sample (Prior to 2009)	
From U.S.	251	59.2%	213	60.5%
From China	146	34.4%	118	33.5%
From other countries	27	6.4%	21	6.0%
Total	424	100%	352	100%

Panel B: Distribution of reverse merger firms by year of merger

Year of RMs	Original Sample from DFM	Inception Sample (Prior to 2012)		Long-run Sample (Prior to 2009)	
		No. of RMs	Days2Filing	No. of RMs	Days2Filing
2001	9	4	421	4	421
2002	25	13	319	13	319
2003	58	22	323	22	323
2004	199	67	463	63	372
2005	210	68	323	67	303
2006	210	72	277	69	230
2007	229	66	236	65	226
2008	211	59	192	49	166
2009	200	29	187	--	--
2010	257	24	171	--	--
Total	1,608	424	289	352	271

Table 2. Key firm characteristics in the year of the RM's first 10-K filing

This table compares a number of key firm characteristics for reverse merger (RMs) and control firms (CLs) (Panel A) and for Chinese RMs (CN RMs) and U.S. RMs (Panel B) in the year of the RM's first 10-K filing (Year T). We use the Inception Sample (see Table 1 for details) for this test. For every RM firm, we identify all firms from the same industry and exchange venue that also filed a 10-K in Year T. We then define the matched control as the firm with a market value of equity (MCAP) closest to the RM firm as of the end of year T. LEV is total short-term and long-term debts divided by total assets. CR is total current assets divided by total current liabilities. SPREAD is the monthly closing spread divided by the midpoint of bid and ask prices, $100 \times (\text{ASK} - \text{BID}) / \text{MID}$ where ASK and BID are monthly closing ask and bid prices and MID is the mean of ASK and BID, averaged over the 12 months of Year T. ROA is income before extraordinary items divided by total assets. CFO is cash flow from operations divided by total assets. AUQ is an indicator variable that equals to zero if auditor issues an unqualified audit opinion and one otherwise. ZSCORE is computed using the revised model for non-manufacturers and emerging markets in Altman (2002). T-statistics and Wilcoxon Z-statistics for the differences in mean and median are reported in the parentheses. ***, **, * denote two-tailed statistical significance at 0.01, 0.05, and 0.10 level, respectively.

Panel A: Summary statistics for RMs and CLs in the year of the RM's first 10-K filing

		RMs		CLs		Diff.	
		Mean	Median	Mean	Median	Mean	Median
Size	MCAP	90.04	45.65	83.33	30.55	6.72	15.09 ^{***}
	(\$million)					(0.41)	(3.07)
Capital Structure	LEV	1.68	0.49	1.43	0.50	0.26	-0.02
	CR	3.13	1.43	3.78	1.43	-0.64	0.00
Liquidity	SPREAD	25.09	21.58	15.36	7.37	9.73 ^{***}	14.21 ^{***}
	(%)					(5.45)	(6.50)
Operation	ROA	-1.71	-0.24	-1.34	-0.17	-0.36	-0.07
	CFO	-0.60	-0.15	-0.57	-0.08	-0.03	-0.08
Audit Opinion	AUQ	0.49	0.00	0.50	0.50	-0.01	-0.50
						(-0.38)	(-0.38)
Financial Distress	ZSCORE	-40.07	0.22	-57.66	-5.18	17.59 [*]	5.40 ^{***}
						(1.71)	(4.12)

Table 2 continued*Panel B: Summary statistics for CN RMs and U.S. RMs in the year of the first 10-K filing*

		CN RMs		U.S. RMs		Diff.	
		Mean	Median	Mean	Median	Mean	Median
Size	MCAP (\$million)	108.98	74.48	76.47	28.38	32.51** (2.37)	46.10*** (4.93)
Capital Structure	LEV	0.51	0.34	2.31	0.66	-1.80*** (-5.72)	-0.32*** (-6.77)
	CR	3.87	2.06	2.52	1.07	1.35** (2.38)	0.99** (5.27)
Liquidity	SPREAD (%)	31.77	29.54	20.33	13.95	11.44*** (4.72)	15.59*** (4.54)
Operation	ROA	-0.08	0.12	-2.57	-0.73	2.49*** (8.52)	0.85*** (13.38)
	CFO	-0.01	0.05	-0.95	-0.38	0.94*** (9.56)	0.43*** (11.72)
Audit Opinion	AUQ	0.23	0.00	0.60	1.00	-0.37*** (-7.92)	-1.00*** (-7.11)
Financial Distress	ZSCORE	6.44	6.15	-65.22	-9.76	71.66*** (6.89)	15.91*** (11.35)

Table 3. An analysis of survival rate and changes in exchange venue over the three years after the RM’s first 10-K filing

This table employs the Long-run Sample (see Table 1 for details) and their matched controls to assess the survival rate and the changes in exchange venues at the RMs’ three-year anniversary dates. Panel A presents the proportion of RMs and CLs in each of three exchange venue tiers: (1) the National Market System (NMS; consisting of NYSE/AMEX and electronically quoted NASDAQ stocks); (2) the Over-the-Counter Bulletin-Board (OTCBB); and (3) OTC Pink Sheet (PINK), as well as the proportion of firms that are either acquired (“ACQ”) or defunct (“DEAD”). Panel B reports the proportion of RMs and CLs that move up (e.g., from PINK to OTCBB, or from OTCBB to NMS) or are acquired (“UP”), move down or are defunct (“DOWN”), or remain unchanged (“NCHG”) in terms of its exchange tier. Panel C and Panel D report the corresponding results for CN RMs and U.S. RMs. T-statistics for the differences are reported in the parentheses. ***, **, * denote two-tailed statistical significance at 0.01, 0.05, and 0.10 level, respectively.

Panel A: Distribution by exchange venue for RMs and CLs

Venue	Year T	Year T+1			Year T+2			Year T+3		
	RMs or CLs	RMs	CLs	Diff.	RMs	CLs	Diff.	RMs	CLs	Diff.
NMS	6.3%	21.0%	15.6%	5.4% [*] (1.86)	36.9%	19.0%	17.9% ^{***} (5.40)	35.8%	20.2%	15.6% ^{***} (4.68)
OTCBB	88.1%	72.7%	70.5%	2.2% (0.65)	47.4%	53.1%	-5.7% (-1.52)	34.4%	42.9%	-8.5% ^{**} (-2.33)
PINK	5.7%	6.0%	10.5%	-4.5% ^{**} (-2.18)	13.6%	19.0%	-5.4% [*] (-1.95)	25.6%	24.4%	1.1% (0.37)
ACQ		0.0%	1.1%	-1.1% ^{**} (-1.98)	0.0%	2.8%	-2.8% ^{***} (-3.18)	0.3%	4.0%	-3.7% ^{***} (-3.41)
DEAD		0.3%	2.3%	-2.0% ^{**} (-2.35)	2.0%	6.0%	-4.0% ^{***} (-2.72)	4.0%	8.5%	-4.5% ^{**} (-2.48)
Total	100%	100%	100%		100%	100%		100%	100%	

Panel B: Cumulative changes in exchange venue for RMs and CLs

	From T to T+1			From T to T+2			From T to T+3		
	RMs	CLs	Diff.	RMs	CLs	Diff.	RMs	CLs	Diff.
UP	17.9%	10.8%	7.1% ^{***} (2.70)	32.7%	17.0%	15.7% ^{***} (4.90)	31.3%	19.6%	11.7% ^{***} (3.60)
NCHG	77.8%	80.4%	-2.6% (-0.85)	54.5%	61.1%	-6.6% [*] (-1.78)	43.5%	50.3%	-6.8% [*] (-1.81)
DOWN	4.3%	8.8%	-4.5% ^{**} (-2.42)	12.8%	21.9%	-9.1% ^{***} (-3.21)	25.3%	30.1%	-4.8% (-1.43)
Total	100%	100%		100%	100%		100%	100%	

Table 3 continued

Panel C: Distribution by exchange venue for CN RMs and U.S. RMs

Venue	Year T			Year T+1			Year T+2			Year T+3		
	CN	US	Diff.	CN	US	Diff.	CN	US	Diff.	CN	US	Diff.
NMS	0.8%	8.9%	-8.1% ^{***} (-3.83)	23.7%	20.7%	3.0% (0.63)	55.1%	29.6%	25.5% ^{***} (4.60)	55.9%	26.3%	29.6% ^{***} (5.41)
OTCBB	95.8%	84.0%	11.8% ^{***} (3.79)	73.7%	71.8%	1.9% (0.37)	37.3%	52.1%	-14.8% ^{***} (-2.64)	24.6%	39.0%	-14.4% ^{***} (-2.78)
PINK	3.4%	7.0%	-3.6% (-1.49)	2.5%	7.0%	-4.5% ^{**} (-1.99)	6.8%	16.0%	-9.2% ^{***} (-2.69)	18.6%	28.6%	-10.0% ^{**} (-2.11)
ACQ				0.0%	0.0%	-	0.0%	0.0%	-	0.0%	0.5%	-0.5% (-1.04)
DEAD				0.0%	0.5%	-0.5% (-1.04)	0.8%	2.3%	-1.5% (-1.14)	0.8%	5.6%	-4.8% ^{***} (-2.70)
Total	100%	100%		100%	100%		100%	100%		100%	100%	

Panel D: Cumulative changes in exchange venue for CN RMs and U.S. RMs

	From T to T+1			From T to T+2			From T to T+3		
	CN	US	Diff.	CN	US	Diff.	CN	US	Diff.
UP	23.7%	16.0%	7.7% [*] (1.66)	55.1%	23.0%	32.1% ^{***} (5.93)	55.1%	19.7%	35.4% ^{***} (6.64)
UCHG	74.6%	79.3%	-4.8% (-0.96)	38.1%	62.4%	-24.3% ^{***} (-4.36)	28.0%	51.2%	-23.2% ^{***} (-4.32)
DOWN	1.7%	4.7%	-3.0% (-1.60)	6.8%	14.6%	-7.8% ^{**} (-2.33)	16.9%	29.1%	-12.2% ^{***} (-2.63)
Total	100%	100%		100%	100%		100%	100%	

Table 4. A comparison of future performance for survivors

This table presents a comparison of future performance between reverse mergers (RMs) and control firms (CLs) (Panel A) and between Chinese RMs (CN RMs) and U.S. RMs (Panel B) over the three years after the RM's first 10-K filing (Year T). In order to assess the future performance at the RMs' three-year anniversary dates, we require that both RM and the matched CL have non-missing financial data from Year T+1 to Year T+3. The sample consists of 173 RMs (including 68 CN RMs and 96 U.S. RMs) and their matched CLs. T-statistics and Wilcoxon Z-statistics for the differences in mean and median are reported in the parentheses. ***, **, * denote two-tailed statistical significance at 0.01, 0.05, and 0.10 level, respectively.

Panel A: Future performance of RMs and CLs over the three years after the RM's first 10-K filing

Variable		Year T+1			Year T+2			Year T+3		
		RMs	CLs	Diff.	RMs	CLs	Diff.	RMs	CLs	Diff.
ROA	Mean	-0.96	-1.01	0.05 (0.21)	-0.91	-0.86	-0.05 (-0.24)	-1.09	-1.03	-0.06 (-0.23)
	Median	-0.16	-0.16	0.00 (-0.65)	-0.13	-0.19	0.06 (1.39)	-0.16	-0.24	0.08* (1.92)
CFO	Mean	-0.45	-0.46	0.02 (0.14)	-0.37	-0.39	0.02 (0.17)	-0.34	-0.45	0.12 (1.14)
	Median	-0.11	-0.10	-0.01 (-0.11)	-0.03	-0.06	0.03 (1.33)	-0.04	-0.07	0.03* (1.70)
AUQ	Mean	0.40	0.49	-0.09 (-1.62)	0.41	0.44	-0.03 (-0.61)	0.46	0.49	-0.03 (-0.55)
	Median	0.00	0.00	0.00 (-1.62)	0.00	0.00	0.00 (-0.61)	0.00	0.00	0.00 (-0.54)
SPREAD	Mean	13.43	10.61	2.82 (1.46)	13.20	13.18	0.01 (0.01)	16.11	22.63	-6.52* (1.92)
	Median	7.05	4.97	2.09* (1.95)	6.50	4.91	1.59 (0.67)	3.69	7.16	-3.47** (2.40)

Table 4 continued

Panel B: Future performance of CN RMs and U.S. RMs over the three years after the first 10-K filing

Variable		Year T+1			Year T+2			Year T+3		
		CN	US	Diff.	CN	US	Diff.	CN	US	Diff.
ROA	Mean	0.01	-1.70	1.71 ^{***} (5.91)	0.02	-1.61	1.63 ^{***} (5.62)	-0.02	-1.90	1.88 ^{***} (4.81)
	Median	0.12	-0.64	0.76 ^{***} (8.83)	0.11	-0.51	0.62 ^{***} (8.20)	0.07	-0.57	0.64 ^{***} (7.73)
CFO	Mean	0.04	-0.81	0.85 ^{***} (6.38)	0.07	-0.71	0.78 ^{***} (6.39)	0.02	-0.60	0.62 ^{***} (5.45)
	Median	0.06	-0.38	0.44 ^{***} (8.39)	0.06	-0.30	0.36 ^{***} (6.96)	0.04	-0.25	0.29 ^{***} (5.98)
AUQ	Mean	0.26	0.49	-0.23 ^{***} (-3.02)	0.25	0.51	-0.26 ^{***} (-3.46)	0.34	0.52	-0.18 ^{**} (-2.36)
	Median	0.00	0.00	0.00 ^{***} (-2.89)	0.00	1.00	-1.00 ^{***} (-3.27)	0.00	1.00	-1.00 ^{**} (-2.30)
SPREAD	Mean	15.80	10.46	5.34 [*] (1.97)	12.28	13.81	-1.53 (-0.56)	11.99	18.50	-6.51 [*] (-1.79)
	Median	10.22	5.00	5.22 ^{***} (2.67)	5.76	7.01	-1.25 (-0.55)	2.00	7.52	-5.52 ^{***} (-3.18)

Table 5. Difference-in-difference comparison of future performance between Chinese and U.S. reverse mergers

This table reports a difference-in-difference (DID) comparison of future performance between Chinese reverse mergers (CN RMs) and U.S. reverse mergers (U.S. RMs). Each RM firm is matched with a control firm (CL) from the same industry and exchange venue that filed a 10-K for the same year (Year T) and had market value of equity at the end of year closet to the RM firm. For each performance measure, the value of the CLs is subtracted from the value of the RMs to eliminate the effects of year, industry, exchange venue, and firm size. In order to assess the future performance at the RMs' three-year anniversary dates, we require that both RM and the matched CL have non-missing financial data from Year T+1 to Year T+3. The sample consists of 68 CN RMs and 96 U.S. RMs with their matched CLs. For the paired difference (e.g., CN-CL), ***, **, * denote two-tailed statistical significance of the mean or the median at 0.01, 0.05, and 0.10 level, respectively. For DID, t-statistics (Wilcoxon z-statistics) for the differences in mean (median) are reported in the parentheses. ***, **, * denote two-tailed statistical significance of the two-sample tests at 0.01, 0.05, and 0.10 level, respectively.

Variable		Year T+1			Year T+2			Year T+3		
		CN-CL	US-CL	DID	CN-CL	US-CL	DID	CN-CL	US-CL	DID
ROA	Mean	0.80***	-0.47	1.27** (2.57)	0.68***	-0.59* (2.99)	1.27***	1.00***	-0.84* (3.49)	1.84***
	Median	0.22***	-0.42**	0.64*** (4.37)	0.17***	-0.19** (4.33)	0.36***	0.20***	-0.11 (3.45)	0.31***
CFO	Mean	0.42***	-0.26	0.68*** (3.06)	0.36***	-0.23 (3.36)	0.59***	0.45***	-0.13 (3.03)	0.58***
	Median	0.11***	-0.16***	0.27*** (4.84)	0.15***	-0.11** (4.16)	0.26***	0.15***	-0.04 (3.18)	0.19***
AUQ	Mean	-0.25***	0.00	-0.25** (-2.22)	-0.15*	0.04 (-1.71)	-0.19*	-0.12	0.01 (-1.27)	-0.13
	Median	0.00	0.00	0.00** (-2.11)	0.00	0.00 (-1.66)	0.00*	0.00	0.00 (-1.30)	0.00
SPREAD	Mean	2.08	3.74**	-1.66 (-0.45)	-5.39	4.45** (-2.10)	-9.84**	-14.21**	0.76 (-2.41)	-14.97**
	Median	1.19	0.44	0.76 (0.45)	0.24	0.31 (-0.78)	-0.06	-2.35**	0.30 (-2.65***)	-2.65***

Table 6. A comparison of future stock returns between Chinese and U.S. reverse mergers

This table compares future stock returns between Chinese reverse merger (CN RMs) and U.S. reverse mergers (U.S. RMs) over the three years after the RM's first 10-K filing (Year T). We use the Long-run Sample (see Table 1 for details) for this test. The raw monthly returns are extracted from Datastream (data type=RI) and adjusted for delisting and acquisition. We set all delisting returns equal to -100 percent. For acquisitions, we hand collect the acquisition prices and the liquidation value is reinvested equally in all the other firms in the same group. Panel A reports the summary statistics of annual buy-hold raw returns over the 12 months starting four months after Year T, T+1, and T+2, respectively, and the three-year cumulative returns. Panel B reports the results of raw returns adjusted for the RM's domicile country market index return: the China A-share index return for CN RMs and the S&P 500 index return for U.S. RMs. The t-statistics for the difference in mean and Wilcoxon Rank-Sum test z-statistics for the difference in median are reported in the parentheses. ***, **, * denote two-tailed statistical significance of the mean and the median at 0.01, 0.05, and 0.10 level, respectively.

Panel A: Stock returns of CN RMs and U.S. RMs over the three years after the first 10-K filing

		Mean	95th	90th	75th	Median	25th	10th	5th
Year T+1	CN	0.47**	3.49	1.77	0.76	-0.08	-0.57	-0.78	-0.92
	US	0.08	2.36	1.29	0.00	-0.46***	-0.70	-0.85	-0.88
	Diff.	0.39* (1.66)				0.38*** (3.62)			
Year T+2	CN	0.25	2.53	1.47	0.47	-0.09	-0.69	-0.85	-0.88
	US	-0.06	2.60	1.00	0.00	-0.50***	-0.76	-0.89	-0.97
	Diff.	0.31* (1.67)				0.41*** (3.13)			
Year T+3	CN	-0.03	1.42	1.01	0.01	-0.42***	-0.64	-0.84	-0.91
	US	-0.16**	1.50	0.84	0.13	-0.42***	-0.65	-0.90	-0.98
	Diff.	0.13 (0.97)				0.00 (0.23)			
Three-year Cumulative	CN	-0.16	1.67	1.07	0.25	-0.49***	-0.85	-0.96	-0.98
	US	-0.28**	2.31	0.39	-0.50	-0.84***	-0.97	-0.99	-0.99
	Diff.	0.12 (0.55)				0.35*** (3.90)			

Table 6 continued*Panel B: Stock returns adjusted for the RM's domicile country market index return*

		Mean	95th	90th	75th	Median	25th	10th	5th
Year T+1	CN	0.27	3.32	1.57	0.47	-0.13	-0.59	-0.98	-1.54
	US	0.05	2.22	1.14	-0.04	-0.46^{***}	-0.76	-0.96	-1.03
	Diff.	0.22 (0.95)				0.33^{***} (2.80)			
Year T+2	CN	0.15	2.25	1.26	0.47	-0.25	-0.51	-0.93	-1.41
	US	-0.08	2.45	0.86	-0.08	-0.44^{***}	-0.72	-0.89	-1.01
	Diff.	0.23 (1.30)				0.19^{***} (3.03)			
Year T+3	CN	0.00	1.51	0.82	0.12	-0.30^{***}	-0.52	-0.71	-0.86
	US	-0.17^{**}	1.35	0.69	0.15	-0.36^{***}	-0.67	-0.92	-1.05
	Diff.	0.17 (1.45)				0.06 (1.57)			
Three-year Cumulative	CN	-0.07	3.01	1.85	0.41	-0.53^{**}	-0.91	-1.29	-1.57
	US	-0.32[*]	2.20	0.44	-0.45	-0.86^{***}	-0.98	-1.02	-1.06
	Diff.	-0.25 (1.11)				0.33^{***} (3.66)			

Table 7. Difference-in-difference comparison of future stock returns between Chinese and U.S. reverse mergers

This table reports the summary statistics of the paired differences in future stock returns between reverse mergers (RMs) and control firms (CLs) as well as a difference-in-difference (DID) comparison between Chinese reverse mergers (CN RMs) and U.S. reverse mergers (U.S. RMs). Each RM firm is matched with a CL from the same industry and exchange venue that filed a 10-K for the same year (Year T) and had market value of equity at the end of year closet to the RM firm. The stock return of the CL is subtracted from the return of the RM to eliminate the effects of year, industry, exchange venue, and firm size. We use the Long-run Sample (see Table 1 for details) for this test. The raw monthly returns are extracted from Datastream (data type=RI) and adjusted for delisting and acquisition. We set all delisting returns equal to -100 percent. For acquisitions, we hand collect the acquisition prices and the liquidation value is reinvested equally in all the other firms in the same group. For the paired difference (e.g., RM-CL), ***, **, * denote two-tailed statistical significance of the mean or the median at 0.01, 0.05, and 0.10 level, respectively. For DID, ***, **, * denote two-tailed statistical significance of the difference in mean (median) at 0.01, 0.05, and 0.10 level using two-sample T-test (Wilcoxon Rank-Sum test), respectively.

		Mean	95th	90th	75th	Median	25th	10th	5th
Year T+1	RM-CL	0.19	3.28	1.78	0.53	-0.08	-0.59	-1.26	-2.17
	CN-CL (a)	0.25	3.70	2.18	0.94	0.16*	-0.55	-1.56	-2.69
	US-CL (b)	0.15	3.27	1.68	0.35	-0.22**	-0.64	-1.26	-1.82
	DID (a-b)	0.10 (0.39)				0.38** (2.39)			
Year T+2	RM-CL	0.17*	2.46	1.58	0.56	-0.01	-0.51	-0.91	-1.18
	CN-CL (a)	0.23*	2.25	1.73	0.95	-0.01	-0.57	-1.10	-1.33
	US-CL (b)	0.14	2.77	1.23	0.46	-0.01	-0.50	-0.88	-1.01
	DID (a-b)	0.09 (0.47)				0.00 (0.82)			
Year T+3	RM-CL	-0.02	1.64	1.05	0.38	-0.12*	-0.51	-0.97	-1.70
	CN-CL (a)	0.09	1.90	1.12	0.36	-0.17*	-0.51	-0.85	-0.98
	US-CL (b)	-0.08	1.46	0.98	0.39	-0.11*	-0.51	-1.06	-2.02
	DID (a-b)	0.17 (1.11)				-0.06 (-0.03)			
Three-year Cumulative	RM-CL	0.04	2.59	1.23	0.34	-0.04	-0.53	-1.10	-2.20
	CN-CL (a)	0.05	2.59	1.41	0.59	0.05	-0.54	-1.13	-2.29
	US-CL (b)	0.04	1.86	0.93	0.18	-0.06**	-0.51	-1.02	-1.59
	DID (a-b)	0.01 (0.04)				0.11* (1.64)			

Table 8. Survivorship and cumulative stock return from inception to 2011

This table reports the exchange venues (Panel A) and the cumulative stock returns (Panel B) of reverse mergers (RMs) and their matched controls (CLs) from the year of the RM's first 10-K filing (Year T) to the end of 2011. We use the Inception Sample (see Table 1 for details) for this test. Panel A presents the proportion of RMs and CLs in each of three exchange venue tiers: (1) the National Market System (NMS; consisting of NYSE/AMEX and electronically quoted NASDAQ stocks); (2) the Over-the-Counter Bulletin-Board (OTCBB); and (3) OTC Pink Sheet (PINK), as well as the proportion of firms that are either acquired ("ACQ") or defunct ("DEAD"). T-statistics for the differences are reported in the parentheses. ***, **, * denote two-tailed statistical significance at 0.01, 0.05, and 0.10 level, respectively. Panel B reports cumulative stock returns of RMs and CLs over the period starting four months after Year T to the end of 2011. The raw monthly returns are extracted from Datastream (data type=RI) and adjusted for delisting and acquisition. We set all delisting returns equal to -100 percent. For acquisitions, we hand collect the acquisition prices and the liquidation value is reinvested equally in all the other firms in the same group. For the paired difference (e.g., RM-CL), ***, **, * denote two-tailed statistical significance of the mean or the median at 0.01, 0.05, and 0.10 level, respectively.

Panel A: Distribution by exchange venue for RMs and CLs as of the end of 2011

Venue	Full Sample (424 RMs/CLs)				Chinese RMs (146 RMs/CLs)				U.S. RMs (251 RMs/CLs)			
	Year T RMs or CLs	2011 RMs	2011 CLs	Diff. T-stat	Year T RMs or CLs	2011 RMs	2011 CLs	Diff. T-stat	Year T RMs or CLs	2011 RMs	2011 CLs	Diff. T-stat
NMS	6.8%	24.3%	16.5%	7.8%*** (2.83)	4.1%	42.5%	15.8%	26.7%*** (5.25)	8.4%	15.9%	16.3%	-0.4% (-0.12)
OTCBB	88.0%	24.8%	28.3%	-3.5% (-1.16)	93.2%	18.5%	35.6%	-17.1%*** (-3.35)	84.9%	27.1%	23.9%	3.2% (0.82)
PINK	5.2%	38.9%	37.7%	1.2% (0.36)	2.7%	34.2%	36.3%	-2.1% (-0.38)	6.8%	41.8%	39.4%	2.4% (0.55)
ACQ		3.1%	6.8%	-3.7%** (-2.49)		3.4%	5.5%	-2.1% (-0.87)		3.2%	7.2%	-4.0%** (-2.03)
DEAD		9.0%	10.6%	-1.6% (-0.78)		1.4%	6.8%	-5.4%** (-2.35)		12.0%	13.1%	-1.1% (-0.37)
Total	100%	100%	100%		100%	100%	100%		100%	100%	100%	

Table 8 continued*Panel B: Cumulative stock return from inception to 2011*

	Mean	95th	90th	75th	Median	25th	10th	5th
RM-CL	0.26	1.96	0.96	0.17	-0.02**	-0.48	-1.03	-1.80
CN-CL	0.61	1.77	1.00	0.23	-0.01	-0.38	-1.00	-1.81
US-CL	0.12	2.20	0.95	0.16	-0.01**	-0.50	-1.03	-1.72