

# Shell Games: Have U.S. Capital Markets been harmed by Chinese companies entering via Reverse Mergers?

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## Abstract

We examine the financial health and 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 foreign RMs). As a group, RMs are small, early-stage companies that typically trade over-the-counter. Chinese RMs (CRMs), however, tend to be more mature and less speculative than either their U.S. counterparts or a group of exchange-industry-size matched firms. Collectively, CRMs outperformed their matched peers from inception through the end of 2011, even after including most of the firms accused of accounting fraud. Despite negative publicity (some from short sellers), we find little evidence that U.S. capital markets have been harmed by the admission of CRMs.

*JEL classification:* G34, M41, N20

*Keywords:* Reverse mergers, security market regulation, listing requirements, Chinese firms, accounting fraud, cash flow life cycle, backdoor listings

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## 1. Introduction

Well-functioning markets require both credibility and access. On the one hand, security markets require sufficient regulation to establish credibility – to convey a sense of fairness, transparency, and trustworthiness to both investors and listing firms. On the other hand, these markets also need to provide adequate investor access: to multiple counterparties, sufficient liquidity, and an attractive set of securities. Laws aimed at increasing one dimension (e.g., market credibility through more stringent disclosure/reporting or listing requirements) can often lead to a reduction in the other (e.g., the number of potentially attractive firms on the exchange).

This delicate balance between credibility and access is in sharp relief as regulators (and investors) in developed countries evaluate firms from emerging economies. On the one hand, companies from emerging countries often offer access to more attractive growth opportunities. On the other hand, these opportunities may come with weaker governance safeguards. A central challenge for both regulators and investors is how to judiciously assess the risks and rewards of such firms.

In this study we investigate a particularly controversial case involving Chinese firms that listed in the United States in recent years. 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).<sup>1</sup> This rapid growth in the number of Chinese RMs (CRMs) listed on U.S. markets drew considerable media attention recently, when a number of them were accused of accounting fraud. In June 2011, the SEC warned investors against investing in firms listing via RMs. In the same year, over 20 U.S. listed CRMs were either delisted or halted from trading, while a number of others had auditor changes or were the target of high-profile short sellers.<sup>2</sup>

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<sup>1</sup> 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 \$12.8 billion, entered U.S. markets through RMs (compared to only 50 Chinese firms that filed for IPOs over this time period).

<sup>2</sup> See Meagher (2011), McCoy and Chu (2011), and Atkins (2011) for examples of media reports on CRMs. 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 CRM, and multiple reports by Citron Research (<http://www.citronresearch.com/citron-knows-china/>). These reports have triggered a recent backlash in China. In a September 6, 2012 editorial, China’s official Xinhua news service complained such reports are a “malicious act” by U.S.

A central issue in the ongoing regulatory review is whether existing laws governing RMs 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.<sup>3</sup> 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 listings.”<sup>4</sup>

In this study, we examine a research question central to the current debate: Have U.S. capital markets been harmed by Chinese companies entering via reverse mergers? Recent regulatory actions by the SEC have effectively frozen the flow of Chinese listings into U.S. markets (in fact the flow has reversed in 2012 as a number of Chinese firms listed in the U.S. have been taken private).<sup>5</sup> While these policies might improve credibility, they have also clearly been costly in terms of U.S. investor access to a high growth region. Using a carefully collected sample, we provide new evidence on whether, as an asset class, the CRMs listed in recent years have been a particularly poor investment vehicle for U.S. investors.

Although accounting integrity and corporate governance problems with Chinese firms are well documented, a number of other economic factors could favor the CRMs. First, rapid development of China’s economy has given rise to many promising start-ups. Second, until recently, private equity and venture capital funds are relatively scarce in China, leaving many entrepreneurs in want of capital. Over the past decade, IPO-eligible firms in China have far outnumbered the actual firms allowed to IPO each year.<sup>6</sup> These factors suggest that

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firms seeking to “poison reputations of China start-ups for profit.” In the same month, more than 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/>).

<sup>3</sup> Over our sample period (Jan 2001 to Dec 2010), about 85% of all foreign-based RMs in the U.S. were from China. The total market capitalization on the RM firms’ first 10-K dates was \$38.2 billion for the full sample, \$19.2 billion for U.S. RMs, and \$15.9 billion for CRMs.

<sup>4</sup> 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).

<sup>5</sup> According to International Business Times, 25 US-listed Chinese firms announced plans to go private in 2012. A number of these deals are already consummated. For example, in March 2012, Zhongpin (a NASDAQ-listed CRM) was acquired at \$13.50 per share, representing a 58.5% premium over its end of 2011 price. In January 2013, Fushi Copperweld, another NASDAQ-listed CRM, was taken private at \$9.50 per share (a premium of 26.3% relative to its closing price at the end of 2011). Since our tests end at the end of 2011, we do not credit the CRMs with these subsequent returns.

<sup>6</sup> Using data collected by China’s National Bureau of Statistics (NBS), Piotroski and Zhang (2012) assemble 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” consists of 28,152 firm-year observations

CRMs could derive from a relatively high quality candidate pool. In short, despite much negative publicity, the overall quality of the CRMs is an open empirical question.

To address this question, we use a carefully constructed (partially hand-collected) data set of RMs that became active on U.S. stock markets between 2001 and 2010. Our analyses focus on two related issues. First, are the existing laws governing RMs too loose – i.e., in general how have RMs fared relative to a group of industry-date-size matched control firms from the same exchange? Second, what is the incremental effect of the “China Factor” – i.e., how has the confluence of economic factors associated with the recent surge in CRMs incrementally impacted the quality of these particular offerings?

Our research design is motivated by a need to distinguish between: (1) problems that are common to all RMs, and (2) problems that plague CRMs in particular. This distinction is important because prior studies consistently find sharp differences between IPO firms and RM firms.<sup>7</sup> 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.<sup>8</sup> Whereas most IPOs begin their life in one of the National Market System (NMS) exchanges, including NYSE, AMEX, or NASDAQ, most RMs begin trading on the OTC Bulletin Board (OTCBB) or as Pink Sheet stocks. Therefore, IPO firms are a particularly poor benchmark by which to evaluate the aftermarket performance of RM firms.

Using a population of control firms that more closely mirror their ex ante risk attributes, we provide 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

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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.

<sup>7</sup> See, for example, Brau, Francis, and Koher (2003), Poulsen and Stegemoller (2005), and Brown, Ferguson, and Lam (2010). As a group, 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.

<sup>8</sup> 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 (see, e.g., Feldman, 2009).

filing, as well as at each of the next three anniversary dates.<sup>9</sup>

Aside from evaluating the health and performance of RMs in general, we are also interested in isolating a “China Factor”.<sup>10</sup> We do so by comparing CRMs 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-differences research design. To ensure we have included the effect of the alleged frauds, we traced the entire list of CRMs suspected of accounting fraud to our sample, and extended all our tests through to the end of 2011 (after the SEC issued its blanket warning against all RMs). We also updated the listing status of the potential fraudulent CRMs in our sample to the end of October 2012.<sup>11</sup>

Our results confirm prior findings that RMs tend to be small and illiquid stocks to begin with; that most begin their life on OTCBB or Pink Sheet; and that they are prone to default and/or delisting over time. However, after controlling for exchange, industry, size, and date, we find no evidence that RMs are more problematic than other publicly listed firms in terms of subsequent operating performance and stock returns. In fact, the RMs in our sample outperform their control firms over the three years after the RM’s first 10-K filing in terms of survival rate, ability to move up in exchange tiers, and increases in market liquidity.

Interestingly, the better performance of the RMs is largely due to CRMs. At the beginning of their public life, CRMs have higher market capitalization, lower leverage, higher profitability, and more positive operating cash flows than U.S. RMs. Over the next three years, CRMs continue to fare better than either their U.S. counterparts or a group of exchange-industry-date-size matched firms. The CRM advantage is multi-dimensional, and is evident in terms of: profitability, current ratio, book leverage, operating cash flows, upward mobility in exchange tiers, percentage of firms with qualified audit opinions, survival rate,

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<sup>9</sup> Because most RMs trade on OTCBB or Pink Sheet, information about their historical exchanges 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.

<sup>10</sup> While media reports often claim CRMs perform poorly, the evidence to date has been largely anecdotal. In those rare instances in which large sample statistics are computed, CRMs 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. For example, Alpert and Norton (2010) compare the first three-year returns on 158 CRMs 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).

<sup>11</sup> Our sample includes 42 (81%) of the total 52 CRMs accused of fraud by the SEC, U.S. media, or short sellers since January 2001. We traced the status of each of these firms to the end of October 2012, and included their performance in our CRM results. As of this writing, despite having their trading suspended, a number of these firms have not actually been convicted of any wrongdoing by the SEC.

market liquidity, as well as stock returns. Contrary to popular media perception, we find no evidence that CRMs are systematically more problematic than similar firms already trading on the same exchange.

A key reason for this better performance appears to be the relative maturity of the CRMs. Using a cash flow based measure of business life cycle (Dickinson, 2011), we show that CRMs are typically further developed in their life cycles than U.S. RMs. In general, the RMs from China are better capitalized, have more positive operating cash flows, and are more likely to be categorized as a Growth or Mature stage firm (versus being an Introductory stage firm). Over the next three years, CRMs are also much more likely to survive and move up in exchange tiers. In short, as an asset class, CRMs appear to be further developed in their life cycle and less speculative in nature than the matching control firms.

One possible concern with these findings is that the accounting frauds perpetuated by CRMs are too elaborate to be detected within a three-year post-listing period. We mitigate this problem to some degree by examining multiple measures of firm health and performance, many of which are not based on accounting numbers. For example, at each anniversary date we examine firms': operating cash flows, audit opinion (qualified or clean), market liquidity, stock return, survival rate, as well as exchange mobility. Nevertheless, it is still possible that the CRMs, as a group, are "fooling the market" for longer than three years.

To directly address this possibility, we searched multiple channels to identify CRMs that were accused of fraud by the SEC, the U.S. media, or short sellers. Our search spanned the period between January 2001 and October 2012 and resulted in a set of 52 firms (see Appendix A).<sup>12</sup> We find that 42 (81%) of these firms are in our sample of CRMs. Among these, 25 were demoted to Pink Sheet and two firms' registrations were revoked by the SEC as of the end of 2011.<sup>13</sup> We then recalculate our results for all RM firms from their first 10-K dates to the end of 2011. These tests show that collectively, the survival rate and exchange mobility of the CRMs (even including the 42 CRMs accused of fraud) are still better than both their control firms and U.S. RMs as of the end of 2011. Moreover, while

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<sup>12</sup> This is the most extensive list that we are aware of, and the total corroborates well with other studies that gather similar data from various media or SEC sources (e.g., Darrough et al. (2012), Chen et al. (2012)).

<sup>13</sup> Section 12(j) of the Exchange Act authorizes the SEC to revoke the registration of a security if the issuer fails to comply with the federal securities laws. Broker-dealers cannot execute any trades in stocks whose registration has been revoked pursuant to Section 12(j).

the U.S. RMs' stock returns are lower than their control firms, the returns of the CRMs are statistically indistinguishable from their control firms.

Another potential concern with our finding is that U.S. RMs are more lottery-like and their outcomes exhibit greater positive skewness. In other words, although CRMs are more likely to survive, the U.S. RM population potentially contains more large positive outliers, which compensates for the lower survival rate. To examine this possibility, we compare the performance of the two RM samples conditioned on survival for three years. Once again, using a difference-in-differences approach to eliminate the confounding effects of size, exchange, filing date, and industry, we find that the surviving CRMs dominate the surviving U.S. RMs in terms of operating performance and earned returns. In short, the superior performance of the CRMs is not driven by differences in either the probability of survival or skewness in the distribution of outcomes.<sup>14</sup>

In sum, we show that CRMs, as an asset class, have performed as well as or better than comparable firms already listed in the same exchanges in the United States. CRMs also perform much better than U.S. RMs on multiple dimensions, even after many CRMs were delisted or demoted due to recent scandals. The emerging picture is that despite a higher incidence of accounting problems, the CRMs are more mature and less speculative than their U.S. counterparts. In terms of the trade-off between credibility and access, we find no evidence that the admission of CRMs into the U.S. has resulted in a net loss to U.S. investors.

Our findings are related to, and extend, the existing literature on RMs. Prior studies that exam the RM market have consistently found that these firms are riskier and more speculative than IPOs. These analyses generally frame RM and IPO as alternative routes to going public. However, in fact most RM firms were never IPO-eligible. Using a hand-collected set of matching firms, we show RM firms do not, as a group, underperform similar publicly listed firms. These results do not support the view that the current RM listing requirements are “too loose”.

We also help to put into perspective concerns with CRMs. While legitimate issues remain with the structural integrity of corporate governance in Chinese firms, our evidence

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<sup>14</sup> In addition, we find that CRMs still outperform U.S. RMs after adjusting for the market return from each firm's country of domicile (i.e., after removing the effect of overall Chinese stock market performance from CRM returns).

indicates that the current Sino-phobic reaction to CRMs is overblown. The set of CRMs admitted to U.S. markets through our sample period have performed well compared to matching firms already listed on the same exchange. This is true even after accounting for the wave of negative sentiment against CRMs 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 2 provides institutional background on RMs, surveys the prior literature, and develops our main hypotheses. Section 3 describes our sample selection and data collection process. Section 4 discusses our empirical results. Finally, Section 5 summarizes these findings and considers implications for investors, regulators, and future research.

## **2. Background and Literature Review**

### *2.1. 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 company agree to certain concessions in exchange for a share in any profits gained if/when the shell is sold.<sup>15</sup> These events are depicted in Figure 1, which we discuss in more detail in Section 3.

Prior studies have addressed both the supply and the demand side of the market for RMs. On the supply side, Floros and Sapp (2011) and Gleason, Rosenthal, and Wiggins (2005) investigate the business of investing in shell companies. Floros and Sapp (2011), 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

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<sup>15</sup> Although the firm is operationally dormant, it is allowed to maintain its publicly listed status on OTCBB or Pink Sheet, if it continues to pay an annual registration fee.



acquisitions using stock as payment. Floros and Sapp show that when a takeover agreement is consummated, the average shell companies' three-month abnormal returns are 48.1%, perhaps reflecting the compensation to investors for shell stock illiquidity and the uncertainty of finding a RM 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 (2008) show RM firms are typically smaller, younger, riskier, and have poorer ex ante performance. Within three years of listing, 42% of the RMs in their sample are delisted compared to 27% of matched IPOs.

Although RMs are generally cheaper and quicker than traditional IPOs,<sup>16</sup> a number of 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; 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. In addition, as a publicly listed firm, a new RM faces significant ongoing regulatory costs, which can be onerous for a small firm with cash constraints.<sup>17</sup>

The central finding that emerges from these studies is that RM firms are strikingly different from IPO firms. 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 would not have preferred to go public via

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<sup>16</sup> Underwriting costs for an IPO typically ranges from 7% to 12% 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 RM can be completed within weeks (see, e.g., Atkins, 2011).

<sup>17</sup> The ongoing 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 the Sarbanes-Oxley Act (SOX), tend to go dark. Iliev (2010) shows that the compliance costs of SOX fall disproportionately on smaller firms.

an IPO, but because for most of them, an IPO was never a realistic option.<sup>18</sup>

In light of the foregoing, we argue that a proper assessment of RMs' aftermarket performance calls for a comparison, not between RMs and IPOs, but between RMs and firms with similar ex ante risk profile. We address this problem using a detailed and partially hand-collected data set that controls for exchange, industry, date of filing, and firm size.

## *2.2. The China factor*

The recent rash of accounting frauds in CRMs 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 RM. During 2011, more than 20 U.S. listed CRMs were delisted or halted from trading. Some of these were accompanied by research reports by well-known short sellers. The general perception, fueled by multiple media reports, is that CRMs are inherently toxic.

The case against the CRMs 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 shown that strong Chinese firms come into the U.S. via IPOs, and that the CRM candidates are looking to skirt regulatory scrutiny via a “backdoor listing.”<sup>19</sup> For example, Jindra, Voetmann, and Walking (2012) find that larger, more reputable Chinese firms are significantly less likely to go public via RMs. Chen et al. (2012) show that CRMs exhibit poorer corporate governance and lower financial reporting quality than Chinese IPOs.

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.<sup>20</sup> On the other hand, there are also compelling reasons why CRMs might not be as toxic as they are portrayed in the media. First, China has experienced explosive

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<sup>18</sup> Compared to their IPO counterparts, operators/owners of a private firm engaged in a RM generally have weak bargaining power. Chaplinsky and Haushalter (2010) provide a good discussion of the role of issuer bargaining power in the context of PIPEs.

<sup>19</sup> This argument applies, of course, equally to U.S. RMs. For example, Givoly, Hayn, and Lourie (2012) show that similar to CRMs, U.S. RMs have lower reporting quality than their industry-size matched peers.

<sup>20</sup> See Allen, Qian, and Qian (2005), Jian and Wong (2010), Jiang, Lee, and Yue (2010), Piotroski and Wong (2012), and Piotroski and Zhang (2012).

growth and until recently the access to alternative capital sources (e.g., private equity and venture capital funds) has been quite limited. This increases the likelihood that CRMs are derived from a pool of relatively high quality candidates. Second, the 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. Thus a typical CRM is likely to be further along the development life cycle than its U.S. counterpart. Third, the RM route to a U.S. listing is not trivial for a Chinese firm. In addition to the usual hurdles faced by U.S. RMs, CRMs must first register with China's State Administration of Foreign Exchange (SAFE) (See Chapter 5 of Feldman, 2009). They then have to be acquired by a foreign-based entity (typically based in the Cayman Islands or some other offshore locales). Finally, Chinese firms that take the U.S. RM route voluntarily expose themselves to U.S. listing regulations and the scrutiny of short sellers (short selling is prohibited in China).

The evidence in a related study, Darrough, Huang, and Zhao (2012, hereinafter DHZ), further thickens the plot. DHZ examine the spillover effect of recent negative news on CRM frauds. They show that the news surrounding CRMs had a dampening effect not only on the share prices of the accused firms, but also on the returns of other seemingly legitimate CRMs and Chinese 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 RM-focused. Another related study by Siegel and Wang (2012) shows that a RM's origin from China does not predict corporate governance outcomes (e.g., late filing of annual reports) after relevant control variables are included. Finally, consistent with prior studies on governance problems with Chinese firms, Chen et al. (2012) show that the financial reporting quality of Chinese RMs is inferior to that of both U.S. reverse merger firms and regular U.S. firms.

While each of these related studies shed some new light on CRMs, none examine the overall performance of CRMs as an asset class. Nor do any of these studies employ a matching algorithm like ours, which is designed to distinguish between an RM effect and a China effect. In our minds, despite considerable bad press, the overall quality of CRMs, as

an investment class, remains an open empirical question.

### 3. 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.<sup>21</sup> 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. DFM defines a merger as RM 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 original sample includes 1,608 RMs that became active on U.S. stock markets between January 2001 and December 2010. DFM defines each private firm's country of origin based on the location of its operation.<sup>22</sup> We hand collect the missing country information from the SEC filings.

Stage 3 is the filing of the first 10-K form by the surviving company. Some RMs report under SEC rules; others do not. Most companies that trade on Pink Sheet can do so without reporting.<sup>23</sup> 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. We view the filing of a 10-K as an indication that the RM firm is serious about

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<sup>21</sup> 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.

<sup>22</sup> 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' address, DFM defines it based on the location of the private firm's main operations. Second, compared to the SDC database, the DFM sample has a more complete and comprehensive listing of RMs.

<sup>23</sup> If a company does an IPO, it is subject to reporting requirements only for one year. After that year, the company can cease reporting and the stock can continue to trade on Pink Sheet. The only requirement is that certain basic information be provided to brokerage firms making a market in the company's stock.

accessing public capital markets. We match the DFM sample with COMPUSTAT using CIK numbers.<sup>24</sup> 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 life. The Long-run Sample, consisted of the RM firms that filed their first post-RM 10-K prior to 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 (CL) for each RM in our sample. To construct our control group, for every RM firm, we identify all firms from the same industry (Fama and French, 1997) and exchange (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 "Year T"). We exclude firms that completed a RM during our sample period from the pool of 10-K filers. We then define the matched CL as the firm with a market value of equity closest to the RM firm as of the end of Year T.

We do not match RMs with CLs on firm age for two reasons. First, the age of a RM should be measured using the age of the private firm (rather than the public shell), which is not publicly available. Second, the age of the CL is also dubious. A CL could have existed for a long time based on its history on COMPUSTAT. However, it does not necessarily mean that the firm is a mature company because the firm could have undergone reorganization, M&A or bankruptcy, and emerged as a young firm in terms of business life

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<sup>24</sup> In the case of shell companies that completed more than one RM, we only retain the last deal. As a result, 37 RMs (related to 35 unique shell companies) are excluded from the sample. These multiple RMs were usually completed in a short time period less than three years. We examine the firms' SEC filings and find that these firms completed multiple RMs because the previous RMs did not result in a viable business operation. As a robustness test, we restrict our sample to the firms that only completed one RM during our sample period and the results are virtually the same.

cycle. This is not a trivial concern for our study because most of the CLs trade on the OTC markets, and thus they are very likely to have experienced such life events. To ensure that our results are not driven by the differences in business life cycle between RMs and CLs, we employ a cash flow based proxy of firm life cycle developed in Dickinson (2011). Based on the patterns of cash flows from operating, investing, and financing activities, Dickinson categorizes firms into five stages: Introduction, Growth, Mature, Shake-out, and Decline.<sup>25</sup>

Because most RMs trade on the OTC markets, their historical exchanges are not available in CRSP. We collect these data from the RMs' 10-K filings. For CLs, 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 OTCBB or Pink Sheet. To ascertain their listing exchange, we manually examine each prospective CL's 10-K filings. If a prospective firm turns out to be a mismatch (e.g., the CL is listed on OTCBB while the RM is listed on 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 to match 424 RMs with CLs in the Inception Sample and 352 RMs with CLs 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 constitute nearly 60% of the observations in both the Inception Sample and the Long-run Sample. CRMs account for 34% of the samples (or about 85% of all foreign RMs). Panel A also reports total market capitalization (MCAP) measured on the first 10-K date. In the Inception Sample, total MCAP is \$38.2 billion, with U.S. RMs and CRMs accounting for 50% and 42%, respectively. Both the number and the size of the CRMs are quite significant, making them an important constituent of the RM market. 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. The pattern is consistent with findings in other studies (e.g., Siegel and Wang, 2012). 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

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<sup>25</sup> For details of the classification scheme, please refer to Dickinson (2011) page 1974.

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 RMs and CLs trade on the 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 delisting and acquisition. To make these adjustments, we begin with the “inactive date” identified by Datastream. We then match this information to our hand-collected exchange 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%. 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 CRMs accused of fraud, we identify 52 CRMs that were cited by the SEC, U.S. media, security class action litigations, or short seller reports from January 2001 to October 2012, as being under suspicion of fraud. Appendix A lists each of these 52 firms, together with various descriptive statistics, including the RM date, the date trading was halted on the NMS exchanges, the date the stock was added on Pink Sheet, the date the stock was delisted by the NMS, and whether the registration was revoked by the SEC, which marks the firm’s disappearance from public sight.<sup>26</sup> Note that only ten of these 52 firms are not in our sample (five because they were not in DealFlow, four were 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 CRMs that are the subject of the recent wave of negative publicity.

## **4. Empirical Results**

### *4.1. Key firm characteristics in the year of the RM’s first 10-K filing*

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<sup>26</sup> This list is based on the information as of October 2012. We complement our list using the list in Siegel and Wang (2012), which includes companies that experienced formal enforcement actions (e.g., SEC trading suspension, SEC litigation, and private litigation) from January 1996 to September 2012. We do not base exclusively on the list in Siegel and Wang because some of the firms we identify are missing from their list. While probably not exhaustive, we suspect the list captures most of the CRMs swept up in the scandal during our sample period. For comparison, DHZ reports 33 such firms from 2000 to 2011 (although they do not list the names).

#### 4.1.1. RMs vs. CLs

To evaluate RMs' risk and performance, we compare a number of metrics, including capital structure, corporate liquidity, market liquidity, operation, audit opinion and business life cycle, between RMs and 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 results are reported in Table 2. The matching algorithm controls quite well for size in the two groups. The mean 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 not statistically significant (t-stat = 0.41).

In terms of capital structure and corporate liquidity, 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, respectively. These statistics indicate that the average 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 the OTC standard. For example, Ang, Shtaubert, and Tetlock (2011) report mean 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 are not likely to survive as going concerns. Indeed, about 50% of both RMs and CLs receive qualified audit report (AUQ). Based on a cursory review, a majority of these audit reports express concerns about the firms' ability to continue as a going concern. Appendix B presents two examples of the typical audit report for the sample firms. Finally, nearly 50% of both RMs and CLs are at the Introduction stage,



suggesting that both groups are dominated by early-stage, speculative firms.<sup>27</sup> Compared to CLs, RMs are more (less) likely to be at the Growth (Mature) stage. Chi-square test ( $\chi^2 = 33.87$ ) rejects that the distributions by life cycle stages are the same in the two groups.

Overall, the results in Panel A of Table 2 show that at their first 10-K filing, the RMs are speculative investments highly prone to default and/or bankruptcy risk. They tend to have extremely small market capitalization and high leverage. Most of these firms would not pass the stringent IPO requirements of NMS. At the same time, these RMs are not notably worse than the CLs, matched by our algorithm. In short, both RM and CL firms reflect the risks inherent in investing in early-stage penny stocks that populate OTCBB and Pink Sheet.

#### *4.1.2. CRMs vs. U.S. RMs*

We also compare the same metrics between CRMs and U.S. RMs at their first 10-K filing. The results are reported in Panel B of Table 2. The mean MCAP is \$108.98 million for CRMs 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, CRMs are much less financially constrained as shown by their significantly lower mean LEV (0.51 vs. 2.31) and much higher mean CR (3.87 vs. 2.52). However, CRMs have lower market liquidity than U.S. RMs at their first 10-K filing. The mean SPREAD is 31.77% for CRMs, compared to 20.33% for U.S. RMs.

CRMs 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 CRMs 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). Auditor reports also confirm that CRMs have a better outlook than U.S. RMs. For 60% of U.S. RMs, auditors express concerns about the company's ability to operate as a going concern. The percentage among CRMs is much lower, at 23%. Compared to U.S. RMs, CRMs are more likely to be at a healthy life cycle stage (i.e., Growth or Mature), with chi-square test ( $\chi^2 = 122.06$ ) strongly rejecting that the distributions by life cycle stages are identical in the two groups.

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<sup>27</sup> For comparison, Dickinson (2011) reports that only 12% of the firms trading on NMS are at Introduction stage, 34% at Growth stage, 41% at Mature stage, 8% at Shake-out stage, and 5% at Decline stage.

Overall, the results in Panel B of Table 2 show that at the beginning of their public life, a typical CRM looks much healthier than a typical U.S. RM. U.S. RMs are smaller, have much poorer operating performance, are more likely to be at early or final stage of their life, and appear decidedly more problematic than CRMs.

#### *4.2. Survival rates and subsequent changes in listing exchange*

The results in Table 2 indicate that the RMs and CLs are highly prone to bankruptcy risk. In this section, we analyze the survival rates and the changes in listing exchange for these firms. We also compare the survival rates between CRMs and U.S. RMs. To assess the survival rates at the RMs' three-year anniversary dates, we use the pre-2009 RMs (i.e., the "Long-run Sample") and their matched CLs.

##### *4.2.1. RMs vs. CLs*

Panel A of Table 3 reports the distribution by exchange 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, both groups have identical distribution in Year T. The results show that in Year T, 88.1% of the RMs trade on OTCBB; 6.3% trade on the NMS; and the remainder trade on Pink Sheet (PINK).

In Year T+1, the paths of the RMs and CLs diverge. Although both groups have more firms trading on 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 because the company has the shares deregistered due to bankruptcy or the stock's registration is revoked by the SEC ("DEAD"), or are acquired ("ACQ"). Chi-square test ( $\chi^2 = 16.78$ ) rejects that the distributions by exchange tiers are the same in the two groups. 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 NMS, compared to 20.2% of the CLs. These firms are the crown jewels of the RM population in the sense that they not only survive but also pass the strict listing requirements of the NMS exchanges. 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). Most of these firms are still struggling to find a viable business model and are probably close to the end of their public life. The remaining RMs are either acquired (0.3% vs. 4.0% for CLs) or dead (4.0% vs. 8.5% for CLs).<sup>28</sup>

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. We define an upward moving if a firm moves from PINK to OTCBB or NMS, or from OTCBB to NMS, or if the firm is acquired. We define a downward moving if a firm moves from NMS to OTCBB or PINK, or from OTCBB to PINK, or if it is dead.<sup>29</sup> There are clearly more RMs moving up in exchange tiers than CLs. For example, at the end of Year T+3, 31.3% of the RMs trade on a higher tier than their initial exchange. In contrast, only 19.6% of the CLs move up in the exchange tiers. It also appears that fewer RMs move down in exchange tiers than CLs, but the difference is small. Later, we formally test the differences between RMs and CLs in the upward and downward mobility in Table 4.

#### 4.2.2. CRMs vs. U.S. RMs

We also compare the survival rates and changes in listing exchange between CRMs and U.S. RMs. Panel B of Table 3 reports the distribution by exchange for the two groups. In Year T, 95.8% of the CRMs trade on OTCBB, and only 0.8% trade on 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 NMS, 84.0% on OTCBB, and 7.0% on PINK. Chi-square test ( $\chi^2 = 11.14$ ) rejects that CRMs and U.S. RMs have same distributions by exchange in Year T.

Although there are fewer CRMs trading on NMS than U.S. RMs in Year T, the CRMs catch up very quickly. By the end of Year T+1, the distributions by exchanges are similar in both groups ( $\chi^2 = 3.75$ ). By the end of Year T+3, the percentage of the CRMs trading on NMS is more than twice as many as the percentage of the U.S. RMs (55.9% vs. 26.3%). Compared to their U.S. counterparts, CRMs are less likely to be defunct (0.8% vs. 5.6% for

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<sup>28</sup> 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 start with the RMs trading on NMS and score a RM as a failure if the stock is delisted to the OTC markets. In our sample, we treat a firm as “DEAD” if it disappears from the public sight for reasons other than acquisition.

<sup>29</sup> We treat OTCBB as a higher exchange tier than PINK because firms traded on OTCBB are subject to more requirements (e.g., be current in the SEC filings). Alternatively, we define “UP” as firms move from the OTC markets to NMS or are acquired, and “DOWN” as firms move from NMS to the OTC markets or are dead. The results are similar.

U.S. RMs). These results show that CRMs not only appear healthier on Day 1, they also continue to perform better, in terms of avoiding default and delisting risk, than U.S. RMs.

Figure 3 clearly shows the differences between CRMs and U.S. RMs in terms of moving up (Panel A) and moving down in exchange tiers (Panel B). Consistent with the results in Panel B of Table 3, the majority (55.1%) of the CRMs trade on a higher tier at their three-year anniversary date than their initial exchange. In contrast, only 19.7% of the U.S. RMs move up in exchange tiers or are acquired. CRMs are also more successful in avoiding downward moving: 16.9% of the CRMs trading on a lower exchange tier at their three-year anniversary date, compared to 29.1% of the U.S. RMs.

To formally test the differences in upward and downward mobility between RMs and CLs, we estimate the following regression:

$$UP_{(t,t+i)} = \alpha + \beta_1 RM_t + \beta_2 INTRODUCTION_t + \beta_3 GROWTH_t + \beta_4 MATURE_t + \beta_5 SHAKE-OUT_t + \beta_6 SIZE_t + \varepsilon_{t+i} \quad (i=1,2,3) \quad (1)$$

$$DOWN_{(t,t+i)} = \alpha + \beta_1 RM_t + \beta_2 INTRODUCTION_t + \beta_3 GROWTH_t + \beta_4 MATURE_t + \beta_5 SHAKE-OUT_t + \beta_6 SIZE_t + \varepsilon_{t+i} \quad (i=1,2,3) \quad (2)$$

where UP (DOWN) is an indicator variable set to one if the firm moves up (down) in exchange tiers or is acquired (dead), and zero otherwise; RM is an indicator variable set to one for RMs, and zero for CLs; INTRODUCTION, GROWTH, MATURE, and SHAKE-OUT are the indicator variables for the respective life cycle stages; SIZE is the logarithm of MCAP. The variable of interest is  $\beta_1$ . Based on the results in Figure 2, we expect  $\beta_1$  to be positive in Eq. (1) and negative in Eq. (2).

Panel A of Table 4 reports the logistic regression results of Eq. (1) and Eq. (2). As expected,  $\beta_1$  is significantly positive in Eq. (1) in all three time periods, suggesting that RMs are more likely to move up in exchange tiers over the three years subsequent to their first 10-K filing, after controlling for the differences in firm life cycle and size. On the other hand, RMs are less likely to move down in exchange tiers in the first two years as shown by the significantly negative  $\beta_1$  in Eq. (2) in the first two time periods. However, the difference in downward mobility between RMs and CLs is no longer significant by the end of Year T+3.

To compare CRMs and U.S. RMs, we replace the variable RM in Eq. (1) and Eq. (2)

with CN, an indicator set to one for CRMs and zero for U.S. RMs, and estimate the regression within the RM sample. Panel B of Table 4 reports the results. For each time period, we first run the regression with CN as the sole predictor. Consistent with results in Figure 3, the coefficient on CN is significantly positive in the upward mobility regression in all three time periods, and significantly negative in the downward mobility regression except for the first year. We next run the regression with controls for life cycle and size. This test penalizes the country factor to some extent as we show CRMs are bigger and more likely to be at a healthy stage (i.e., Growth and Mature) than U.S. RMs. The results show that if we hold the size and life cycle constant, CRMs are still much more likely to move up in exchange tiers than U.S. RMs, although the difference is not significant in the first year. On the other hand, the difference in downward mobility between the two samples disappears.

To summarize, the evidence so far suggests that RMs and CLs have similar characteristics in Year T except for market liquidity and the compositions in the Growth and the Mature stages. Over the next three years, RMs have significantly higher survival rate and upward mobility than CLs even after controlling for the differences in life cycle stage. The comparison in Year T between CRMs and U.S. RMs shows that CRMs are much healthier than U.S. RMs in terms of market capitalization, financial constraint, operating performance, and business life cycle. CRMs also have a much higher survival rate and are more likely to move up in exchange tiers over the next three years.

Next we compare the future performance between RMs and CLs and between CRMs and U.S. RMs conditioning on both RMs and their matched CLs survive at the end of 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”).

#### *4.3. Comparing future performance*

As shown in Panel B of Table 2 and Panel B of Table 3, CRMs 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 size, exchange, time, and industry on performance, we employ a

difference-in-differences approach (DID) to compare future performance between CRMs and U.S. RMs. The sample for this test consists of 68 CRMs and 96 U.S. RMs with matched CLs that have non-missing financial data from Year T+1 to Year T+3. Panel A of Table 5 reports univariate comparison. For each performance metric, the value of the CLs is subtracted from the value of the RMs. The first (second) column under each year reports the summary statistics of the paired difference between Chinese (U.S.) RMs and their matched CLs. 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 CRMs is higher (lower) than the value of the U.S. RMs after controlling for the effects of size, exchange, industry, and time.

Panel A shows CRMs 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 CRMs 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. CRMs have fewer firms receiving qualified audit opinion (AUQ) than their CLs in all three years. However, the difference is not significant in Year T+3. In terms of market liquidity, CRMs are less liquid than CLs in year T+1, but become more liquid than CLs in Year T+2 and T+3, with the difference significant at 5% level in Year T+3.

In contrast to CRMs, 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 CRMs have significantly higher ROA and CFO than their U.S. peers after eliminating the effects of size, exchange, time, and industry. CRMs are also less likely to receive qualified audit opinion than U.S. RMs although the difference is not significant in Year T+3. Finally, CRMs become more liquid than U.S. RMs over time, consistent with the better upward mobility of CRMs shown in Table 4.

Panel B of Table 5 reports multivariate regression results. For each performance metric,

we estimate the following regression:

$$VAR_{(t+i)} = \alpha + \beta_1 RM_t + \beta_2 CN_t + \beta_3 RM * CN_t + \beta_4 INTRODUCTION_t + \beta_5 GROWTH_t + \beta_6 MATURE_t + \beta_7 SHAKE - OUT_t + \beta_8 SIZE_t + \varepsilon_{t+i} \quad (i=1,2,3) \quad (3)$$

where VAR represents each performance metric; CN is an indicator set to one for CRMs and their matched CLs, and zero for U.S. RMs and their matched CLs. Using this model specification, we are able to compare the future performance of CRMs and U.S. RMs while controlling for the differences in life cycle as shown in Table 2. The variable of interest is  $\beta_3$ , the coefficient of RM\*CN, which measures the DID comparison.

As Panel B shows,  $\beta_3$  is positive and statistically significant in Year T+2 and Year T+3 when the performance metric is ROA. The results suggest that CRMs still report significantly higher earnings than their U.S. peers in Year T+2 and Year T+3, after eliminating the effects of size, exchange, time, industry, and business life cycle. The results for CFO are similar except that  $\beta_3$  is statistically significant in Year T+1 as well. When the performance metric is AUQ,  $\beta_3$  is negative but only statistically significant in Year T+1. This suggests that CRMs are still less likely to receive qualified audit opinion than U.S. RMs in Year T+1 if both groups are at the same life cycle. Finally, when the performance metric is SPREAD,  $\beta_3$  is negative and statistically significant except for Year T+1. This confirms that CRMs improve market liquidity more quickly than U.S. RMs.

In short, the results of the DID analyses in Table 5 suggest that CRMs, as a group, are not more problematic than their U.S. peers. In fact, we find that CRMs generally fare much better than U.S. RMs after taking into account the confounding effects of size, exchange, time, industry, and business life cycle.

#### *4.4. Comparison of future returns*

##### *4.4.1. Annual buy-hold raw returns*

Next, we compare future stock returns realized by RMs and CLs. 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 CRM and U.S. RM samples have fared relative to those in the CL sample.

Panel A of Table 6 presents the comparison of the return distributions between CRMs and U.S. RMs.<sup>30</sup> The return distributions of both CRMs and U.S. RMs exhibit great positive skewness and large variance. For example, in Year T+1 the 95<sup>th</sup> percentile of the annual buy-hold return distribution is 349% for CRMs and 236% for U.S. RMs, respectively. The interquartile range is 133% for CRMs and 70% for U.S. RMs. On average, CRMs earned 47% while U.S. RMs earned 8% in Year T+1 (t-stat for difference = 1.66). The median annual return is -8% for CRMs, compared to -46% for U.S. RMs (Wilcoxon z-statistic on the difference is 3.62). Overall CRMs earn higher stock returns in Year T+1 than U.S. RMs, with similar results over the next two years. Focusing on the three-year cumulative returns for the two groups, CRMs 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 CRMs and U.S. RMs, respectively, with the difference significant at 1% level (z-stat = 3.90). Overall, our results show that the typical RM loses value for investors over the three years after their first 10-K filing. However the distribution is highly positively skewed, and CRMs collectively report significantly higher returns than U.S. RMs.

#### *4.4.2. 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 CRMs stems from the booming Chinese economy over the sample period.<sup>31</sup> To examine this possibility, we use two market index returns, the China A-share index and the S&P 500 index, to proxy for the macroeconomic conditions in China and U.S., respectively. We then compare the two RM samples using returns adjusted for the RM's domicile country market index return. The results are reported in Panel B of Table 6. In general, the adjustment indeed has bigger impact on CRMs than U.S. RMs. However, after controlling for the macroeconomic conditions in both countries, CRMs still collectively report higher returns than U.S. RMs in all three years, significantly so for Year T+1 and T+2. Overall, the results in Panel B of Table 6 indicate that the superior market performance of CRMs is not driven

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<sup>30</sup> We use the Long-run Sample for the tests in Table 6 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.

<sup>31</sup> 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.



entirely by the booming Chinese economy.

#### *4.4.3. Difference-in-differences analysis of stock returns*

Finally, we also use a difference-in-difference (DID) approach to eliminate the confounding effects of size, exchange, time, and industry on stock returns. Panel C reports the summary statistics of the paired differences in future stock returns between RMs and their matching controls firms (CLs) as well as a DID comparison between CRMs and U.S. RMs. The stock return of each matching CL is subtracted from the return of the original RM to eliminate the effects of year, industry, exchange, and firm size. Panel C results show that after controlling for these confounding effects, CRMs as a group still earn higher returns than U.S. RMs. For example, in Year T+1, the median CRM outperformed its matching control firm by 16%, while the median U.S. RM underperformed its control firm by 22%. The difference of 38% is quite statistically significant (Wilcoxon  $Z=2.39$ ). Cumulatively over the next three years, the difference-in-difference (DID) result between Chinese and U.S. RMs also favors the CRMs. Once again, we find little evidence in market performance to support the notion that CRMs are systematically more problematic.

#### *4.5. Snapshot at the end of 2011*

In early June 2011, the SEC warned investors against investing in firms listing via RMs. In the same year, over 20 U.S. listed CRMs were either delisted or halted from trading, while a number of others had auditor changes or were the target of short sellers. In Appendix A, we report 52 CRMs accused of fraud by the media, short sellers or the SEC from January 2001 to October 2012.<sup>32</sup> Our sample includes 42 of these firms.

As shown in Appendix A, a vast majority of the fraud firms were demoted to Pink Sheet by the end of 2011. In the aftermath of these scandals, CRMs, 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,

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<sup>32</sup> Note that nine of the 52 CRMs (China Automotive Systems, New Energy Systems Group, Fushi Copperweld, Gulf Resources, Orient Paper, China Marine Food Group, China Green Agriculture, SkyPeople Fruit Juice, and Yongye International) were accused of fraud by short sellers or class action litigations. The companies' stock prices dropped significantly following the issuance of short sale reports or the filing of litigations. However, as of Oct. 2012 the SEC and the listing stock exchanges had not found any wrongdoing in these companies, and their stocks were still trading on their respective NMS exchanges.

particularly CRMs, 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 7.

Panel A of Table 7 presents the distribution by exchange of the RMs and CLs in Year T and at the end of 2011. Although RMs and CLs started off on the same exchange, RMs were more likely to trade on NMS (24.3% vs. 16.5%) than CLs as of the end of 2011. In both groups, about 38% of the firms were quoted on Pink Sheet and 10% of the firms were dead by the end of 2011. Note that while a majority of firms in both groups were either dead or languishing in Pink Sheet by the end of 2011, the RMs actually outperformed their matched CLs in terms of upward mobility. Chi-square test ( $\chi^2 = 14.06$ ) rejects that the two groups have same distributions by exchange in 2011.

The superior upward mobility of the RMs is primarily driven by CRMs. Although over 90% of the CRMs started on OTCBB, 42.5% were trading on one of the NMS exchanges as of the end of 2011, compared to 15.8% in CL group. Despite the fact that most of the fraudulent CRMs were already demoted to Pink Sheet by the end of 2011, the overall proportion of Pink Sheet firms for the CRMs (34.2%) is comparable to the CL group (36.3%). Moreover, only 1.4% of the CRMs were actually dead by the end of 2011, compared to 6.8% of the CLs. Overall, these results show that CRMs significantly outperformed their CLs in terms of survival rate and upward mobility, even after the strongly negative publicity of 2011.

For reference, we also compared U.S. RMs with their CLs. Our results show the two groups had similar distributions by exchanges as of the end of 2011 ( $\chi^2 = 4.65$ ). Approximately 16% of the firms in each group were traded on NMS, 40% were quoted on Pink Sheet, and 12% were dead.

In Panel B of Table 7, we use regression analysis to compare the upward and downward mobility of RMs and CLs while controlling for the differences in firm life cycle. The first two columns report the results for the full sample. Consistent with the results in Panel A, RMs were more likely to move up in exchange tiers than CLs as of the end of 2011, indicated by the positive and statistically significant coefficient on the indicator variable RM ( $\chi^2 = 2.88$ ). In terms of downward mobility, the two samples are indistinguishable. The

coefficient on RM in the upward mobility regression is positive and statistically significant at 1% level ( $\chi^2 = 13.59$ ) in the CRM sample, but negative and insignificant in the U.S. RM sample, confirming the superior upward mobility of RMs is driven by CRMs. Finally, we adopt the DID approach to compare CRMs with U.S. RMs. To control for the difference in merger year between CRMs and U.S. RMs, we add a variable TLAG, which measures the number of years between the first 10-K date and December 31, 2011. In the upward mobility regression, the coefficient on the interaction term between RM and CN is positive and significant at 1% level ( $\chi^2 = 11.37$ ), indicating that CRMs strongly dominated U.S. RMs in terms of upward mobility as of the end of 2011.

In Panel C of Table 7, 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 CRMs and CLs are 61% and -1%, respectively, with neither statistic being significant. Despite suffering from extremely negative public sentiment, CRMs still generated comparable stock returns as their CLs. In contrast, although they largely escaped investors' wrath in 2011, U.S. RMs still significantly underperformed their CLs.

The results in Table 7 reinforce the evidence from prior tests: in sum, we find no evidence that CRMs are inherently more problematic, than other similarly sized publicly listed firms from the same industry and exchange.

## **5. Summary**

This study examines the performance of RMs that became active on U.S. stock markets between 2001 and 2010, particularly those from China. Our analysis is motivated by a need to distinguish between: (1) problems that are common to all RMs, and (2) problems that plague CRMs 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 life on NYSE, AMEX, or NASDAQ, most RMs begin trading on the OTC Bulletin Board 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 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 first 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. Over the next three years, RMs are more likely to move up in exchange tier than their control firms (31.3% vs. 19.6%), and are less likely to move down (25.3% vs. 30.1%). Overall, we find little evidence that RMs are collectively 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 CRMs generally outperform. CRMs are healthier than U.S. RMs on Day 1 (they are larger, less levered, more profitable, less likely to have a qualified audit opinion, and more likely to be at the Growth or Mature stage of the business life cycle). Over the next three years, the two groups diverge even further in terms of performance. While most (55.1%) of the CRMs either move up in exchange tier or are acquired, only a minority (19.7%) of the U.S. RMs do so. The CRMs 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 CRMs generally outperform their control firms, while U.S. RMs generally underperform, over the next three years. We show that most of

this return difference is not attributable to differences in exposure to the Chinese economy.

Overall, we contribute to the general literature on RMs by showing that, given proper matching to a set of comparable publicly listed firms from the same exchange, 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 CRMs may be overblown. Using a wide range of performance metrics, we find that CRMs are healthier on Day 1, and continue to fare better over the next three years. Extending our results to the end of 2011, we show that even after the recent maelstrom, CRMs 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 (81%) of the CRMs that have been accused of financial misconduct since 2001.

In sum, recent bad press notwithstanding, we find virtually no evidence that Chinese RMs are systematically more problematic than other comparable firms that are already listed on the same exchange. Our results do not support the view that CRMs are collectively exploiting a significant loophole in U.S. listing regulations. These findings should be useful to investors interested in better understanding the risk-return proposition of Chinese firms listed in the U.S. We believe they are also helpful to market regulators, as they pursue the challenge of balancing access and credibility.

Finally, it is our hope and expectation that these findings will be of interest to academics, and that they will stimulate further research, not only on Chinese firms imported into the U.S., but also on the delicate calculus of market regulation. More stringent disclosure requirements and improved financial reporting quality are surely desirable qualities, but at what cost to access? Given the current stalemate between China and the U.S. on this issue, the need for further research seems pressing.

**Appendix A. CRMs accused of fraud by the media, short sellers or the SEC from January 2001 to October 2012**

No.	Name	RM date	Exchange prior to citation/report	Trading halted by NMS	Added to Pink Sheet	Delisted by NMS	Registration revoked by the SEC*	In sample?
1	Subaye, Inc.	2000/12/21	NASDAQ	2011/04/07	2011/06/24	2011/11/10	-	No <sup>m</sup>
2	China Automotive Systems Inc.	2003/03/05	NASDAQ	- <sup>a</sup>	-	-	-	Yes
3	New Energy Systems Group	2003/12/03	NYSE	- <sup>b</sup>	-	-	-	Yes
4	China Expert Technology Inc.	2004/02/09	OTCBB	- <sup>c</sup>	2007/09/21	-	2011/03/25	Yes
5	Bodisen Biotech, Inc.	2004/02/12	AMEX	2007/03/20	2007/04/02	2007/04/24	-	Yes
6	China North East Petroleum Holdings Limited	2004/03/29	AMEX	2012/03/01	2012/06/21	2012/07/06	-	No <sup>d</sup>
7	Advanced Battery Technologies, Inc.	2004/04/21	NASDAQ	2011/11/15	2011/11/30	2011/12/16	-	Yes
8	China Energy Savings Technology Inc.	2004/06/18	NASDAQ	2006/02/15	2006/05/19	2006/05/19	2006/12/08	Yes
9	China Education Alliance, Inc.	2004/12/13	NYSE	2011/12/21	2011/12/29	2012/01/11	-	Yes
10	China Digital Media Corp.	2004/12/28	OTCBB	- <sup>c</sup>	-	-	2011/02/14	No <sup>c</sup>
11	China Agritech, Inc.	2005/02/03	NASDAQ	2011/03/14	2011/05/20	2011/07/13	2012/10/17	Yes
12	Puda Coal, Inc.	2005/07/15	AMEX	2011/04/11	2011/08/18	2011/09/12	-	Yes
13	Fushi Copperweld, Inc.	2005/11/11	NASDAQ	- <sup>f</sup>	-	-	-	Yes
14	China Natural Gas, Inc.	2005/12/06	NASDAQ	2011/09/21	2012/03/08	2012/04/20	-	Yes
15	China Medicine Corporation	2006/02/08	OTCBB	- <sup>c</sup>	2011/05/20	-	-	Yes
16	China-Biotics, Inc.	2006/03/23	NASDAQ	2011/06/15	2011/07/01	2011/07/11	-	Yes
17	ShengdaTech, Inc.	2006/03/31	NASDAQ	2011/03/15	2011/06/10	2011/12/16	-	Yes
18	Asia Biotechnology Group Inc.	2006/05/08	PINK	- <sup>c</sup>	2007/03/15	-	2008/10/16	No <sup>e</sup>
19	China Sky One Medical, Inc.	2006/05/30	NASDAQ	2012/02/15	2012/03/07	2012/03/14	-	Yes
20	Greater China Media & Entertainment Corp	2006/06/14	PINK	- <sup>c</sup>	2009/06/24	-	2012/03/16	No <sup>d</sup>
21	Wonder Auto Technology, Inc.	2006/06/22	NASDAQ	2011/05/06	2011/09/12	2012/01/06	-	Yes
22	Universal Travel Group	2006/07/12	NYSE	2011/04/11	2012/05/07	2012/04/26	-	Yes

**Appendix A. continued**

No.	Name	Reverse merger date	Exchange prior to citation/report	Trading halted by NMS	Added to Pink Sheet	Delisted by NMS	Registration revoked by the SEC*	In sample?
23	Duoyuan Printing, Inc.	2006/10/06	NYSE	2011/04/01	2011/04/04	2011/10/06	-	Yes
24	Sino Clean Energy Inc.	2006/10/18	NASDAQ	2012/05/21	2012/09/25	-	-	Yes
25	AgFeed Industries, Inc.	2006/10/31	NASDAQ	2011/12/19	2012/02/10	2012/02/10	-	Yes
26	Fuqi International, Inc.	2006/11/20	NASDAQ	2011/03/29	2011/03/29	2011/06/03	-	No <sup>d</sup>
27	Gulf Resources, Inc.	2006/12/10	NASDAQ	- <sup>g</sup>	-	-	-	Yes
28	Long-e International, Inc.	2006/12/29	PINK	- <sup>c</sup>	2007/05/22	-	2012/04/11	No <sup>e</sup>
29	A-Power Energy Generation Systems, Ltd.	2007/02/09	NASDAQ	2011/06/27	2011/09/26	2012/04/13	-	No <sup>d</sup>
30	China Ritar Power Corp.	2007/02/16	NASDAQ	2011/04/18	2011/06/23	2011/07/05	-	Yes
31	China Organic Agriculture	2007/03/15	OTCBB	- <sup>c</sup>	2011/04/26	-	-	Yes
32	Jiangbo Pharmaceuticals, Inc.	2007/10/01	NASDAQ	2011/05/31	2011/08/04	2011/10/06	-	Yes
33	RINO International Corp.	2007/10/05	NASDAQ	2010/11/17	2010/12/08	2010/12/20	-	Yes
34	China Integrated Energy, Inc.	2007/10/23	NASDAQ	2011/04/20	2011/06/15	2011/11/10	-	Yes
35	Orient Paper, Inc.	2007/10/30	AMEX	- <sup>h</sup>	-	-	-	Yes
36	China Marine Food Group	2007/11/23	AMEX	- <sup>i</sup>	-	-	-	Yes
37	China Valves Technology, Inc.	2007/12/18	NASDAQ	2012/07/13	2012/09/21	2012/09/21	-	Yes
38	China Green Agriculture	2007/12/26	NYSE	- <sup>j</sup>	-	-	-	Yes
39	China Changjiang Mining & New Energy Company, Ltd.	2008/02/04	OTCBB	- <sup>c</sup>	2011/04/07	-	-	Yes
40	SkyPeople Fruit Juice, Inc.	2008/02/26	NASDAQ	- <sup>k</sup>	-	-	-	Yes
41	Yuhe International, Inc.	2008/03/12	NASDAQ	2011/06/17	2011/07/21	2011/12/16	-	Yes
42	Yongye International, Inc.	2008/04/17	NASDAQ	- <sup>l</sup>	-	-	-	Yes
43	Nivs Intellimedia Technology Group, Inc.	2008/07/25	AMEX	2011/03/24	2011/06/23	2011/07/19	-	Yes
44	Deer Consumer Products, Inc.	2008/09/03	NASDAQ	2012/08/13	-	-	-	Yes

## Appendix A. continued

No.	Name	Reverse merger date	Exchange prior to citation/report	Trading halted by NMS	Added to Pink Sheet	Delisted by NMS	Registration revoked by the SEC*	In sample?
45	ZST Digital Networks, Inc.	2009/01/09	NASDAQ	2012/03/27	2012/04/26	2012/04/16	-	Yes
46	China Electric Motor, Inc.	2009/05/06	NASDAQ	2011/03/31	2011/06/14	2011/10/06	-	Yes
47	China MediaExpress Holdings, Inc.	2009/10/15	NASDAQ	2011/03/11	2011/05/19	2011/12/16	2012/08/28	No <sup>d</sup>
48	China Intelligent Lighting and Electronics, Inc.	2010/01/15	AMEX	2011/03/24	2011/06/17	2011/07/19	-	Yes
49	Keyuan Petrochemicals, Inc.	2010/04/22	NASDAQ	2011/04/01	2011/10/07	2012/04/13	-	Yes
50	China Century Dragon Media, Inc.	2010/04/30	AMEX	2011/03/21	2011/06/17	2011/10/07	-	Yes
51	Heli Electronics Corp.	2010/06/15	OTCBB	- <sup>c</sup>	2011/03/25	-	2012/03/02	No <sup>e</sup>
52	CleanTech Innovations, Inc.	2010/07/02	NASDAQ	2011/03/02	2011/03/02	2011/12/16	-	Yes

The table is ordered by the date of RM.

\* When a company's registration is revoked by the SEC, its stock can no longer be publicly traded even on Pink Sheet.

<sup>a</sup> Sued in security class action litigation on Oct. 25, 2011 for fraudulent reporting. The company's stock was still trading on NASDAQ as of Oct. 2012.

<sup>b</sup> Sued in security class action litigation on Feb. 10, 2012 for fraudulent reporting. The company's stock was still trading on NYSE as of Oct. 2012.

<sup>c</sup> The company was traded on OTCBB or PINK prior to citation/report. Thus, there is no trading halt date or delisting date by NMS for the company.

<sup>d</sup> The observation was missing in the original DealFlow Media's reverse merger report.

<sup>e</sup> The financial data are missing from COMPUSTAT.

<sup>f</sup> Muddy Waters published a short sale report on Fushi Copperweld in April 2012. The company's stock was still trading on NASDAQ as of Oct. 2012.

<sup>g</sup> Glaucus Research published a short sale report "Another day, another fraud: Latest Chinese Fraud Du Jour: Gulf Resources (GFRE), Price Target \$0.00" on April 26, 2011. The company's stock was still trading on NASDAQ as of Oct. 2012.

<sup>h</sup> 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 was still trading on NYSE/AMEX as of Oct. 2012.

<sup>i</sup> 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 trading on NYSEAMEX as of Oct. 2012.

<sup>j</sup> 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 trading on NYSE as of Oct. 2012.

<sup>k</sup> Sued in security class action litigation on Apr. 20, 2011 for fraudulent reporting. The company's stock was still trading on NASDAQ as of Oct. 2012.

<sup>l</sup> Sued in security class action litigation on May 26, 2011 for fraudulent reporting. The company's stock was still trading on NASDAQ as of Oct. 2012.

<sup>m</sup> The RM was completed prior to 2001, the starting year of our sample period.



## **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.

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 fiscal performance

#### Tree Top Industries Inc. (TTII)

TTII completed RM 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 RM 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 has 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	<u>4,488,215</u>	<u>2,448,371</u>
Net cash flows provided by financing activities	<u>4,572,483</u>	<u>2,972,183</u>

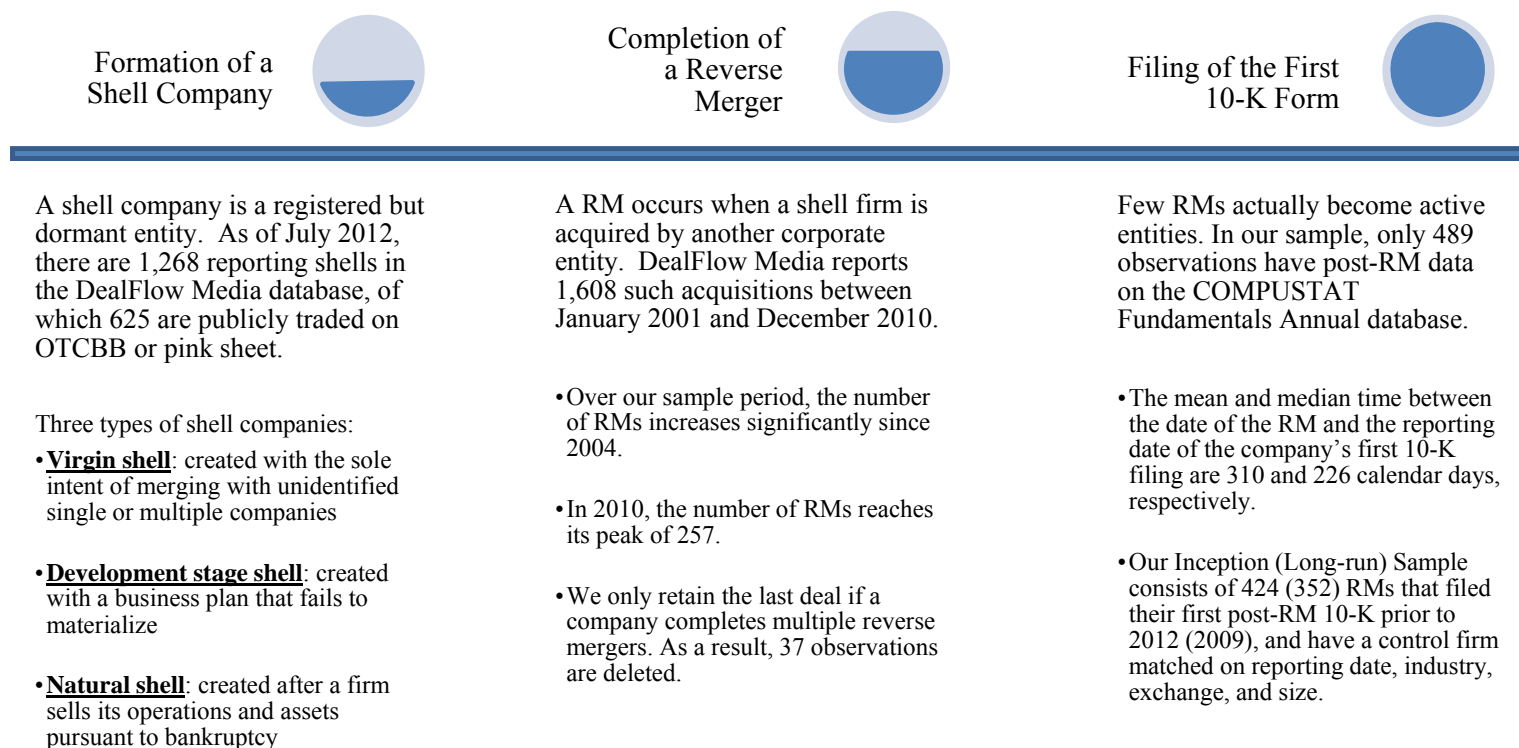
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## Figure 1. Key stages in a reverse merger

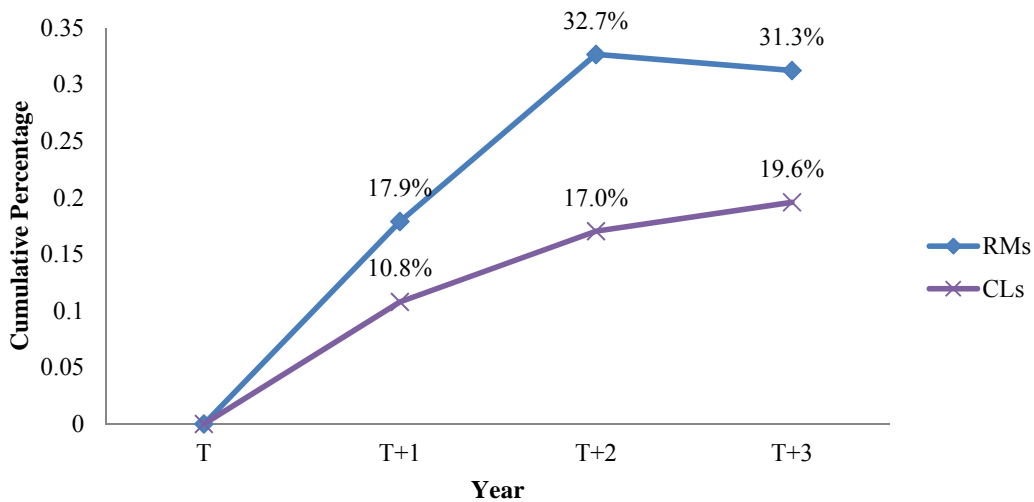
This figure depicts the three stages in the formation of a RM firm, as well as the number of firms in the DealFlow Media database at each stage. Stage 1 is the formation of a Shell Company. Stage 2 is the completion of a RM transaction, defined as the acquisition of a shell company by another corporate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



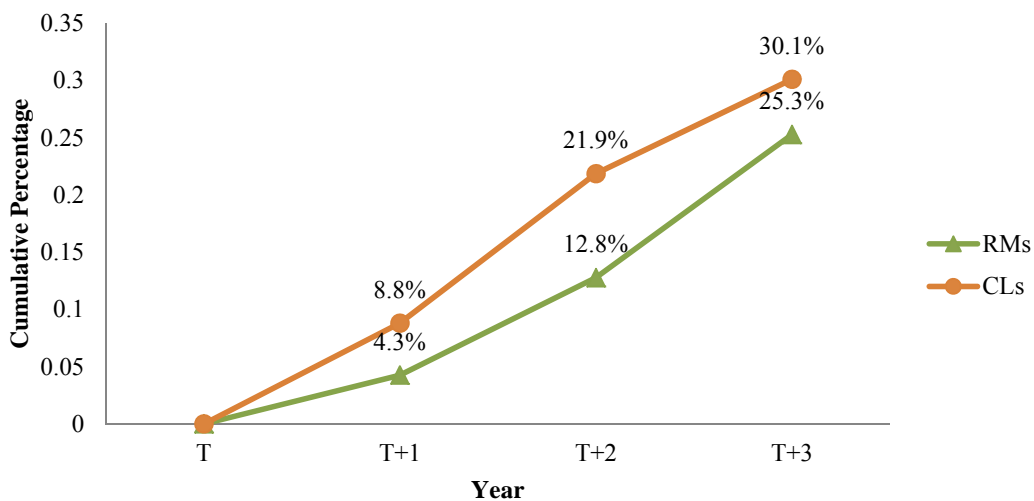
## Figure 2. Changes in exchange for reverse mergers and control firms

These figures depict the cumulative directional change in exchange listing for RMs and 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 that also filed a 10-K in Year T. We then define the matched CL 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 352 pre-2009 RMs and their matched CLs (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 NMS, or from OTCBB to NMS), or were acquired. Panel B presents the proportion of firms that moved down (e.g., from NMS to OTCBB or Pink Sheet, or from OTCBB to Pink Sheet), or were dead.

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



**Panel B: Proportion of firms that moved down or were dead**

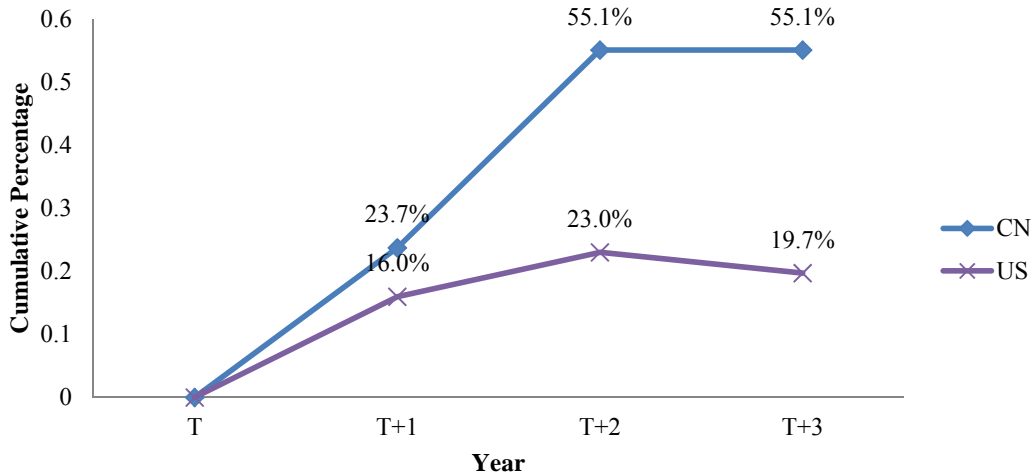




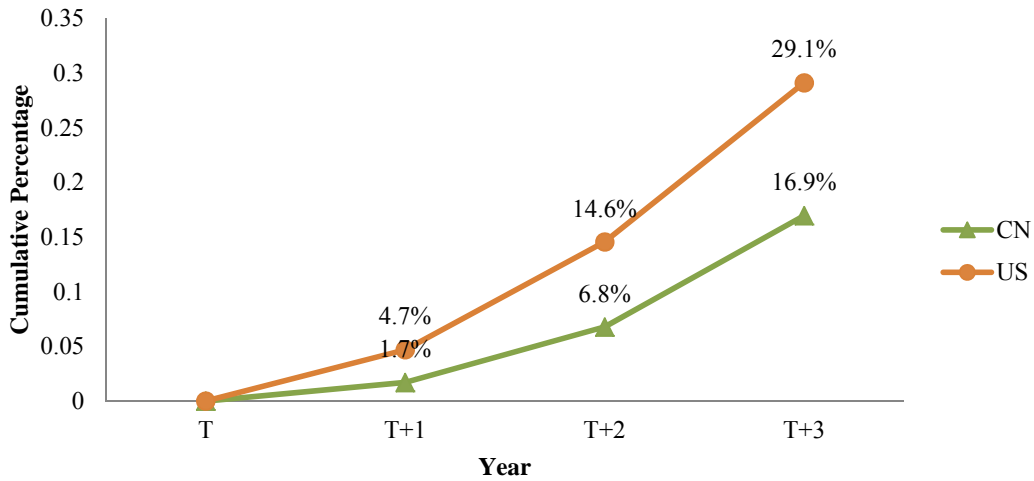
### Figure 3. Changes in exchange for Chinese versus U.S. RMs

These figures depict the cumulative directional change in exchange for CRMs and 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 CRMs 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 NMS, or from OTCBB to NMS), or were acquired. Panel B presents the proportion of firms that moved down (e.g., from NMS to OTCBB or Pink Sheet, or from OTCBB to Pink Sheet), or were dead.

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



**Panel B: Proportion of firms that moved down or were dead**



**Table 1. Sample description**

This table 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). 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, and size. Country classification is based on the location of the main operations of the private firm in a RM. Total market capitalization is measured on the first 10-K date. 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 RM firms by country***

	Inception Sample (Prior to 2012)		Long-run Sample (Prior to 2009)	
	No. of Obs.	Total Market Capitalization (\$mil)	No. of Obs.	Total Market Capitalization (\$mil)
<b>From U.S.</b>	251	19,195	213	16,359
<b>From China</b>	146	15,911	118	13,009
<b>From other countries</b>	27	3,072	21	1,382
<b>Total</b>	424	38,178	352	30,750

***Panel B: Distribution of RM 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
<b>2001</b>	9	4	421	4	421
<b>2002</b>	25	13	319	13	319
<b>2003</b>	58	22	323	22	323
<b>2004</b>	199	67	463	63	372
<b>2005</b>	210	68	323	67	303
<b>2006</b>	210	72	277	69	230
<b>2007</b>	229	66	236	65	226
<b>2008</b>	211	59	192	49	166
<b>2009</b>	200	29	187	-	-
<b>2010</b>	257	24	171	-	-
<b>Total</b>	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 RMs and CLs (Panel A) and for CRMs 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 that also filed a 10-K in Year T. We then define the matched CL 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 (i.e.,  $100*(ASK-BID)/(MID)$ ), 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 set to zero if auditor issues an unqualified audit opinion and one otherwise. Firm life cycle is measured using the cash flow based proxy developed by Dickinson (2011). Each life cycle stage (i.e., INTRODUCTION, GROWTH, MATURE, SHAKE-OUT, and DECLINE) is an indicator variable set to one if the observation is in that stage, and zero otherwise. 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 (N=424)		CLs (N=424)		Diff.	
		Mean	Median	Mean	Median	Mean	Median
<b>Size</b>	MCAP (\$million)	90.04	45.65	83.33	30.55	6.72 (0.41)	15.09*** (3.07)
<b>Capital Structure</b>	LEV	1.68	0.49	1.43	0.50	0.26 (1.04)	-0.02 (-0.12)
<b>Corporate Liquidly</b>	CR	3.13	1.43	3.78	1.43	-0.64 (-1.34)	0.00 (0.52)
<b>Market Liquidity</b>	SPREAD (%)	25.09	21.58	15.36	7.37	9.73*** (5.45)	14.21*** (6.50)
	ROA	-1.71	-0.24	-1.34	-0.17	-0.36 (-1.53)	-0.07 (-0.08)
<b>Operation</b>	CFO	-0.60	-0.15	-0.57	-0.08	-0.03 (-0.35)	-0.08 (-1.16)
<b>Audit Opinion</b>	AUQ	0.49	0.00	0.50	0.50	-0.01 (-0.38)	-0.50 (-0.38)
<b>Life Cycle Stage</b>	INTRODUCTION	0.50	0.50	0.49	0.00	Diff. in distribution: $\chi^2=33.87$ p = 0.000	
	GROWTH	0.20	0.00	0.12	0.00		
	MATURE	0.06	0.00	0.17	0.00		
	SHAKE-OUT	0.07	0.00	0.06	0.00		
	DECLINE	0.17	0.00	0.16	0.00		Fisher's exact test: p = 0.000

**Table 2. continued**

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

		CRMs (N=146)		U.S. RMs (N=251)		Diff.	
		Mean	Median	Mean	Median	Mean	Median
<b>Size</b>	MCAP (\$million)	108.98	74.48	76.47	28.38	32.51** (2.37)	46.10*** (4.93)
<b>Capital Structure</b>	LEV	0.51	0.34	2.31	0.66	-1.80*** (-5.72)	-0.32*** (-6.77)
<b>Corporate Liquidity</b>	CR	3.87	2.06	2.52	1.07	1.35** (2.38)	0.99*** (5.27)
<b>Market Liquidity</b>	SPREAD (%)	31.77	29.54	20.33	13.95	11.44*** (4.72)	15.59*** (4.54)
<b>Operation</b>	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)
<b>Audit Opinion</b>	AUQ	0.23	0.00	0.60	1.00	-0.37*** (-7.92)	-1.00*** (-7.11)
<b>Life Cycle Stage</b>	INTRODUCTION	0.27	0.00	0.63	1.00	Diff. in distribution: $\chi^2=122.06$ p = 0.000	
	GROWTH	0.44	0.00	0.06	0.00		
	MATURE	0.13	0.00	0.02	0.00		
	SHAKE-OUT	0.09	0.00	0.06	0.00	Fisher's exact test: p = 0.000	
	DECLINE	0.07	0.00	0.24	0.00		

**Table 3. An analysis of survival rate and changes in exchange 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 CLs to assess survival rate and changes in exchange at the RMs' three-year anniversary dates. Panel A presents the proportion of RMs and CLs in each of three exchange tiers: (1) the National Market System (NMS; consisting of NYSE/AMEX and NASDAQ); (2) the OTC Bulletin-Board (OTCBB); and (3) OTC Pink Sheet (PINK), as well as the proportion of firms that are either acquired ("ACQ") or deregistered due to bankruptcy or registration revoked by the SEC ("DEAD"). Panel B reports the corresponding results for CRMs and U.S. RMs.

**Panel A: Distribution by exchange for the RMs and their CLs in the Long-run Sample**

Venue	Year T			Year T+1			Year T+2			Year T+3		
	RM	CL	Diff.	RM	CL	Diff.	RM	CL	Diff.	RM	CL	Diff.
<b>NMS</b>	6.3%	21.0%	15.6%				36.9%	19.0%		35.8%	20.2%	
<b>OTCBB</b>	88.1%	72.7%	70.5%				47.4%	53.1%		34.4%	42.9%	
<b>PINK</b>	5.7%	6.0%	10.5%				13.6%	19.0%		25.6%	24.4%	
<b>ACQ</b>		0.0%	1.1%				0.0%	2.8%		0.3%	4.0%	
<b>DEAD</b>		0.3%	2.3%				2.0%	6.0%		4.0%	8.5%	
<b>Total</b>	100%	100%	100%				100%	100%		100%	100%	

**Panel B: Distribution by exchange for the CRMs and U.S. RMs in the Long-run Sample**

Venue	Year T			Year T+1			Year T+2			Year T+3		
	CN	US	Diff.	CN	US	Diff.	CN	US	Diff.	CN	US	Diff.
<b>NMS</b>	0.8%	8.9%		23.7%	20.7%		55.1%	29.6%		55.9%	26.3%	
<b>OTCBB</b>	95.8%	84.0%		73.7%	71.8%		37.3%	52.1%		24.6%	39.0%	
<b>PINK</b>	3.4%	7.0%		2.5%	7.0%		6.8%	16.0%		18.6%	28.6%	
<b>ACQ</b>				0.0%	0.0%		0.0%	0.0%		0.0%	0.5%	
<b>DEAD</b>				0.0%	0.5%		0.8%	2.3%		0.8%	5.6%	
<b>Total</b>	100%	100%		100%	100%		100%	100%		100%	100%	

**Table 4. Comparison of upward and downward mobility controlling for firm size and life cycle stages**

This table compares the upward and downward mobility in exchange tiers between RMs and CLs 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) and the matched CLs for this test. UP is an indicator variable set to one if a firm moves from PINK to OTCBB or NMS, or from OTCBB to NMS, or if the firm is acquired, and zero otherwise. DOWN is an indicator variable set to one if a firm moves from NMS to OTCBB or PINK, or from OTCBB to PINK, or if the firm is dead, and zero otherwise. RM is an indicator variable set to one for RMs, and zero for CLs. CN is an indicator variable set to one for CRMs, and zero for U.S. RMs. Firm life cycle is measured using the cash flow based proxy developed by Dickinson (2011). Each life cycle stage (i.e., INTRODUCTION, GROWTH, MATURE, SHAKE-OUT, and DECLINE) is an indicator variable set to one if the observation is in that stage in Year T, and zero otherwise. SIZE is the logarithm of firm's market value of equity at the end of Year T. Panel A reports logistic regression results comparing RMs with CLs. Panel B reports logistic regression results comparing CRMs with U.S. RMs. Wald  $\chi^2$  statistics are reported in the parentheses. \*\*\*, \*\*, \* denote two-tailed statistical significance at 0.01, 0.05, and 0.10 level, respectively.

**Panel A: Logistic regression comparing the RMs and their CLs in the Long-run Sample**

	Move from T to T+1		Move from T to T+2		Move from T to T+3	
	UP	DOWN	UP	DOWN	UP	DOWN
Intercept	-3.46*** (64.04)	-2.04*** (21.02)	-3.23*** (75.95)	-0.75** (6.29)	-3.07*** (70.63)	-0.07 (0.07)
<b>RM</b>	<b>0.49**</b> <b>(4.45)</b>	<b>-0.72**</b> <b>(4.76)</b>	<b>0.78***</b> <b>(16.28)</b>	<b>-0.62***</b> <b>(8.54)</b>	<b>0.55***</b> <b>(8.51)</b>	<b>-0.20</b> <b>(1.28)</b>
INTRODUCTION	-0.01 (0.00)	-0.08 (0.04)	0.04 (0.02)	0.20 (0.46)	0.13 (0.17)	0.15 (0.36)
GROWTH	-0.01 (0.00)	-0.12 (0.05)	0.95*** (7.79)	-0.32 (0.61)	1.10*** (10.36)	-0.37 (1.23)
MATURE	-0.22 (0.22)	0.10 (0.03)	0.40 (1.07)	-0.14 (0.13)	0.71* (3.52)	-0.32 (0.83)
SHAKE-OUT	-0.26 (0.24)	-0.52 (0.41)	0.33 (0.58)	-0.01 (0.00)	0.55 (1.64)	-0.33 (0.64)
SIZE	0.39*** (21.91)	-0.08 (0.70)	0.39*** (31.80)	-0.18*** (9.43)	0.36*** (28.62)	-0.24*** (18.83)

**Table 4. continued**

*Panel B: Logistic regression comparing the CRMs and U.S. RMs in the Long-run Sample*

	Move from T to T+1				Move from T to T+2				Move from T to T+3			
	UP		DOWN		UP		DOWN		UP		DOWN	
Intercept	-1.66*** (78.83)	-2.95*** (27.59)	-3.01*** (86.38)	-2.27*** (12.00)	-1.21*** (55.06)	-2.85*** (32.89)	-1.77*** (82.99)	-1.00** (5.00)	-1.40*** (66.47)	-3.21*** (35.14)	-0.89*** (34.83)	-0.20 (0.32)
CN	<b>0.49*</b> <b>(2.98)</b>	<b>0.41</b> <b>(1.37)</b>	<b>-1.05</b> <b>(1.80)</b>	<b>-0.46</b> <b>(0.40)</b>	<b>1.41***</b> <b>(32.82)</b>	<b>1.03***</b> <b>(11.59)</b>	<b>-0.85**</b> <b>(4.21)</b>	<b>-0.35</b> <b>(0.54)</b>	<b>1.61***</b> <b>(40.46)</b>	<b>1.25***</b> <b>(16.51)</b>	<b>-0.70**</b> <b>(5.89)</b>	<b>-0.37</b> <b>(1.18)</b>
INTRODUCTION		0.29 (0.35)	-0.44 (0.42)		0.33 (0.58)		0.01 (0.00)		0.56 (1.41)		-0.12 (0.10)	
GROWTH		0.34 (0.36)	-1.86 (1.43)		1.07** (4.64)		-1.96* (3.05)		1.24** (5.47)		-0.91* (2.72)	
MATURE		-1.44 (1.58)	0.50 (0.20)		0.11 (0.03)		0.54 (0.45)		0.33 (0.23)		0.20 (0.10)	
SHAKE-OUT		-0.06 (0.01)	-0.02 (0.00)		-0.03 (0.00)		-0.15 (0.04)		0.25 (0.14)		-0.02 (0.00)	
SIZE		0.30*** (8.09)	-0.08 (0.28)		0.37*** (16.28)		-0.24** (6.05)		0.36*** (14.53)		-0.18** (5.24)	

**Table 5. Difference-in-differences comparison of future performance between Chinese and U.S. RMs**

This table reports a difference-in-differences (DID) comparison of future performance between CRMs and U.S. RMs. 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 CRMs and 96 U.S. RMs with their matched CLs. Panel A reports univariate comparison. 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, and firm size. 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. Panel B reports multivariate regression results. RM is a dummy variable set to one for RM firms, and zero for CL firms. CN is a dummy variable set to one for CRMs and their matched CLs, and zero for U.S. RMs and their matched CLs. RM\*CN is the interaction variable of RM and CN, which measures the difference between CN-CL and US-CL, i.e., the DID effect. Firm life cycle is measured using the cash flow based proxy developed by Dickinson (2011). Each life cycle stage (i.e., INTRODUCTION, GROWTH, MATURE, SHAKE-OUT, and DECLINE) is an indicator variable set to one if the observation is in that stage in Year T, and zero otherwise. SIZE is the logarithm of firm's market value of equity at the end of Year T. T-statistics (or Wald  $\chi^2$  statistics if AUQ is the dependent variable) are reported in the parentheses. \*\*\*, \*\* and \* denote significance at 0.01, 0.05 and 0.10 level using two-tailed test, respectively.

**Panel A: Univariate comparison of the CRMs, U.S. RMs and their CLs**

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
<b>ROA</b>	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***
<b>CFO</b>	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***
<b>AUQ</b>	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
<b>SPREAD</b>	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 (-2.69)	-2.65***



**Table 5. continued**

*Panel B: Multivariate regressions*

	ROA			CFO			AUQ			SPREAD		
	T+1	T+2	T+3	T+1	T+2	T+3	T+1	T+2	T+3	T+1	T+2	T+3
Intercept	-1.55*** (-3.31)	-1.06** (-2.54)	-1.92*** (-3.68)	-0.64*** (-3.04)	-0.54*** (-3.03)	-0.72*** (-3.83)	0.83* (3.69)	0.51 (1.46)	1.37*** (9.36)	27.02*** (7.79)	29.88*** (7.21)	42.27*** (6.80)
RM	-0.24 (-0.72)	-0.41 (-1.36)	-0.74** (-1.97)	-0.14 (-0.93)	-0.12 (-0.94)	-0.04 (-0.30)	-0.07 (0.06)	0.03 (0.01)	-0.12 (0.14)	4.70* (1.93)	5.30* (1.83)	1.68 (0.39)
CN	0.38 (1.03)	0.29 (0.88)	-0.03 (-0.07)	0.14 (0.84)	0.16 (1.19)	0.02 (0.12)	0.21 (0.40)	-0.24 (0.53)	-0.17 (0.25)	5.10** (2.05)	7.31** (2.38)	8.92* (1.90)
<b>RM*CN</b>	<b>0.70</b> <b>(1.30)</b>	<b>0.89*</b> <b>(1.85)</b>	<b>1.56**</b> <b>(2.60)</b>	<b>0.40*</b> <b>(1.67)</b>	<b>0.34*</b> <b>(1.68)</b>	<b>0.36*</b> <b>(1.69)</b>	<b>-0.95*</b> <b>(3.62)</b>	<b>-0.48</b> <b>(0.89)</b>	<b>-0.12</b> <b>(0.06)</b>	<b>1.35</b> <b>(0.37)</b>	<b>-7.17*</b> <b>(-1.68)</b>	<b>-12.77*</b> <b>(-1.84)</b>
INTRODUCTION	-0.12 (-0.29)	-0.23 (-0.64)	0.79* (1.77)	-0.03 (-0.19)	-0.05 (-0.34)	0.03 (0.16)	0.00 (0.00)	-0.17 (0.22)	-0.14 (0.15)	-6.83** (-2.40)	-9.69*** (-2.78)	-5.74 (-1.09)
GROWTH	1.02** (2.04)	0.57 (1.28)	1.13** (2.02)	0.55** (2.45)	0.45** (2.36)	0.43** (2.14)	-0.18 (0.16)	-0.84* (3.29)	-0.77* (2.80)	-8.96*** (-2.62)	-11.78*** (-2.82)	-8.14 (-1.28)
MATURE	1.26** (2.36)	0.92* (1.94)	1.69*** (2.84)	0.66*** (2.76)	0.56*** (2.75)	0.60*** (2.83)	-0.90* (3.17)	-1.06** (4.37)	-1.33*** (6.58)	-3.48 (-0.92)	-10.16** (-2.20)	-4.31 (-0.61)
SHAKE-OUT	1.20** (1.97)	0.88 (1.62)	1.80*** (2.65)	0.58** (2.13)	0.42* (1.82)	0.31 (1.31)	-0.52 (0.86)	-1.04* (3.22)	-0.96* (2.82)	-2.69 (-0.62)	0.63 (0.12)	3.80 (0.48)
SIZE	0.00 (0.06)	-0.02 (-0.27)	-0.01 (-0.05)	-0.02 (-0.57)	-0.02 (-0.55)	0.02 (0.64)	-0.20** (5.89)	-0.07 (0.79)	-0.25*** (8.65)	-3.75*** (-6.00)	-3.37*** (-4.43)	-5.40*** (-4.69)
Adj. R <sup>2</sup>	9.7%	9.3%	7.2%	11.8%	13.1%	8.2%	-	-	-	20.7%	13.0%	9.6%

**Table 6. A comparison of future stock returns between Chinese RMs, U.S. RMs, and their respective matching firms**

This table compares future stock returns between CRMs and 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%. For acquisitions, we hand collect the acquisition prices and the liquidation value is reinvested equally in all the other firms in the same group. We report results over the 12 months starting four months after Year T, T+1, and T+2, respectively, and the three-year cumulative returns.

In Panel A, table values represent summary statistics for the RMs' raw returns. In Panel B, table values represent each RM's raw return minus the return of the market index for the country of domicile: that is, the China A-share index return for CRMs and the S&P 500 index return for U.S. RMs. In Panel C we report summary statistics for the paired differences in future returns between RMs and their controls firms (CLs), as well as a difference-in-differences (DID) comparison between CRMs and 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. For the DID measures, \*\*\*, \*\*, \* 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.

**Panel A: Future stock returns of the CRMs and U.S. RMs after the first 10-K filing**

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

**Table 6. Continued**

**Panel B: Future stock returns adjusted for the RM's domicile country market index return**

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

**Panel C: A difference-in-difference comparison of future returns between RMs and Controls (CL)**

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

**Table 7. Survivorship and cumulative stock return from inception to 2011**

This table reports survivorship, exchange mobility, and cumulative stock return of RMs and 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 tiers: NMS, OTCBB, PINK, as well as the proportion of firms that are either acquired (“ACQ”) or deregistered due to bankruptcy or registration revoked by the SEC (“DEAD”). Panel B reports the logistic regressions of upward and downward mobility as of the end of 2011. UP is an indicator variable set to one if a firm moves from PINK to OTCBB or NMS, or from OTCBB to NMS, or if the firm is acquired, and zero otherwise. DOWN is an indicator variable set to one if a firm moves from NMS to OTCBB or PINK, or from OTCBB to PINK, or if the firm is dead, and zero otherwise. RM is an indicator variable set to one for RMs, and zero for CLs. CN is an indicator variable set to one for CRMs, and zero for U.S. RMs. Firm life cycle is measured using the cash flow based proxy developed by Dickinson (2011). Each life cycle stage (i.e., INTRODUCTION, GROWTH, MATURE, SHAKE-OUT, and DECLINE) is an indicator variable set to one if the observation is in that stage in Year T, and zero otherwise. SIZE is the logarithm of firm’s market value of equity at the end of Year T. TLAG is the number of years between the first 10-K date and the end of 2011. Wald  $\chi^2$  statistics are reported in the parentheses. Panel C reports the paired difference of 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%. For acquisitions, we hand collect the acquisition prices and the liquidation value is reinvested equally in all the other firms in the same group. \*\*\*, \*\*, \* denote two-tailed statistical significance at 0.01, 0.05, and 0.10 level, respectively.

**Panel A: Distribution by exchange for the RMs and their CLs in the Inception Sample 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.	Year T RMs or CLs	2011 RMs	2011 CLs	Diff.	Year T RMs or CLs	2011 RMs	2011 CLs	Diff.
<b>NMS</b>	6.8%	24.3%	16.5%		4.1%	42.5%	15.8%		8.4%	15.9%	16.3%	
<b>OTCBB</b>	88.0%	24.8%	28.3%	$\chi^2=14.06$ p = 0.007	93.2%	18.5%	35.6%	$\chi^2=31.92$ p = 0.000	84.9%	27.1%	23.9%	$\chi^2=4.65$ p = 0.325
<b>PINK</b>	5.2%	38.9%	37.7%		2.7%	34.2%	36.3%		6.8%	41.8%	39.4%	
<b>ACQ</b>		3.1%	6.8%	Fisher's exact test: p = 0.007		3.4%	5.5%	Fisher's exact test: p = 0.000		3.2%	7.2%	Fisher's exact test: p = 0.328
<b>DEAD</b>		9.0%	10.6%			1.4%	6.8%			12.0%	13.1%	
<b>Total</b>	100%	100%	100%		100%	100%	100%		100%	100%	100%	

**Table 7. continued**

*Panel B: Logistic regression of upward and downward mobility*

	RMs vs. CLs		CRMs vs. CLs		U.S. RMs vs. CLs		CRMs vs. U.S. RMs	
	UP	DOWN	UP	DOWN	UP	DOWN	UP	DOWN
Intercept	-2.74*** (72.79)	0.57** (6.52)	-2.59*** (19.38)	0.39 (0.86)	-2.81*** (42.70)	0.62** (4.96)	-2.92*** (49.34)	-0.63** (4.41)
<b>RM</b>	<b>0.25*</b> <b>(2.88)</b>	<b>0.02</b> <b>(0.02)</b>	<b>1.11***</b> <b>(13.59)</b>	<b>-0.10</b> <b>(0.13)</b>	<b>-0.27</b> <b>(1.04)</b>	<b>0.10</b> <b>(0.28)</b>	-0.23 (0.82)	0.05 (0.06)
CN							-0.12 (0.19)	0.02 (0.01)
<b>RM*CN</b>							<b>1.32***</b> <b>(11.37)</b>	<b>-0.21</b> <b>(0.41)</b>
INTRODUCTION	-0.08 (0.09)	0.15 (0.55)	0.21 (0.16)	-0.17 (0.17)	-0.21 (0.36)	0.24 (1.00)	-0.07 (0.06)	0.04 (0.04)
GROWTH	0.75** (6.08)	-0.14 (0.31)	0.58 (1.16)	-0.63 (1.90)	0.13 (0.07)	0.32 (0.76)	0.36 (1.16)	-0.06 (0.04)
MATURE	0.52 (2.34)	-0.30 (1.16)	0.40 (0.47)	-0.86* (3.10)	0.05 (0.01)	0.16 (0.18)	0.20 (0.31)	-0.26 (0.72)
SHAKE-OUT	0.50 (1.66)	0.04 (0.01)	0.00 (0.00)	-0.28 (0.26)	1.02** (3.87)	-0.09 (0.04)	0.47 (1.25)	-0.24 (0.44)
SIZE	0.31*** (24.69)	-0.23*** (24.69)	0.21** (5.05)	-0.12* (2.71)	0.38*** (18.81)	-0.27*** (19.27)	0.30*** (21.17)	-0.24*** (24.16)
TLAG							0.07 (2.10)	0.29*** (49.42)

*Panel C: Cumulative stock return from inception to 2011*

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