

Dissecting the Long-term Performance of the Chinese Stock Market*

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Abstract

The Chinese economy, the largest in the world in PPP terms, has been the fastest growing for the past three decades, and the size of the Chinese stock market is the second largest in the world. Listed firms that contribute to the growth ‘miracle’ and have exceeded expectations should deliver superior long-run returns to investors. During the period 2000-2014, we find that China’s *domestic* market and its listed firms underperform markets and listed firms from developed and emerging countries, and matched *unlisted* firms. Chinese firms listed overseas, especially those listed in Hong Kong, perform much better. We examine reasons for the disconnection between economic growth and stock market performance. Problematic IPO and delisting processes exacerbate the adverse selection of firms in the market. With much higher levels of investment compared to listed firms from the US, Japan, India and Brazil, Chinese firms generate lower net cash flows, implying low investment efficiency. Lower cash flows are associated with more related-party transactions, indicating deficiencies in corporate governance.

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I. INTRODUCTION

The Chinese economy has performed extraordinarily well in the past thirty-five years. In 1980, China's GDP was less than 10% of that of the US; at the end of 2014, according to World Bank, China has overtaken the U.S. and become the largest economy in the world as measured in Purchasing Power Parity (PPP) terms.¹ The impressive growth of such a large economy has far exceeded expectations of investors and pundits worldwide. In PPP terms, it will have *doubled* the US GDP around 2035 as long as it maintains an average growth rate that is at least twice as high as that of the US.

The Chinese stock market started in 1990 with the establishment of two domestic stock exchanges (the "A share" market): the Shanghai Stock Exchange (SHSE hereafter) and the Shenzhen Stock Exchange (SZSE). Each listed firm must be approved by the China Securities Regulation Commission (CSRC, equivalent to the SEC in the US). The market has been growing fast since its inception with now more than 2,300 firms listed and traded in the two exchanges. As of the end of 2014, the Chinese A share market is the second largest in the world in terms of total market capitalization, trailing only the US equity markets.

According to asset pricing research, listed firms that have been contributing to China's growth 'miracle' and exceeded investors' expectations should generate superior (long-run) returns. However, the performance of the Chinese stock market has been disappointing, especially in comparison with the growth of the economy. We start from December 31, 1991. The (real) GDP growth of China eclipses that of a number of other large developed and emerging economies over the period 1992-2014 (Figure 1, Panel A). By contrast, the Shanghai Composite has been one of the worst performing indexes in the world; only the Nikkei from Japan has

¹ See <http://data.worldbank.org/data-catalog/GDP-PPP-based-table> for the complete rankings of GDPs in PPP terms.

performed worse (Figure 2). A simple measure to gauge the link between economic growth and stock market performance is the correlations between the two. In this regard, long-term stock market returns in most large developed economies, such as the US, Japan, Germany and France, are strongly positively correlated with future, long-run GDP growth rates. The correlation is also positive in many large emerging economies, such as India, Russia, Brazil, and South Africa. The correlation between long-run market returns and future GDP growth for China, however, is less than 2% and statistically insignificant (Table 2).²

The Shanghai Composite rose after its establishment but fell dramatically in real terms subsequently; this was due to high inflation in the early 1990s (Figure 3). Moreover, many of the securities laws and regulations were introduced and implemented after 2000, and the pace of adding new firms to the exchanges slowed down after 2000. For these reasons we focus on the period from January 1, 2000 to the end of 2014 in the paper. The Chinese economy grew by a factor of 3.7 in real terms over this period, still much faster than the rest of the large economies, including India and Brazil (Figure 1, Panel B).

In terms of the cumulative, ‘buy and hold’ returns, based on our calculations aggregated from firm-level returns including dividends, the performance of the Chinese market is the worst of the group of large countries, including Japan (Figure 4) over the period 2000-2014.³ Investors in the market earned zero return in real terms, and the cumulative return of the market is much lower than that of five-year bank deposits or three- and five-year government bonds in China (Figure 5). In firm-level, cross-country regressions after controlling for country- and firm-level

² A line of literature, including Beck, Feyen, Ize and Moizeszowicz (2008), Levine, Loayza and Beck (2000), Levine and Zervos (1998), argues that financial development, such as growth of stock markets and financial intermediation, should be positively related to economic growth.

³ The Chinese stock market witnessed substantial rise and fall during 2015. The runup began in late 2014 triggered in part by loose monetary policies to boost the slowing economy and margin lending, and the market peaked in early June. It then crashed in July; the fall (temporarily) stopped after CSRC implemented a series of unprecedented actions including the suspension of trading by almost half of listed firms and suspension of selling by all the large shareholders. For more details, see, e.g., “China’s stock market crash: One year later”, *Forbes* (07/13/2016).

factors, we find that firms listed in the Chinese A share market underperform their counterparts in other developing and developed economies by 10%-11% per annum. By contrast, there is no difference in stock returns between the Chinese firms listed overseas, mostly in Hong Kong and the US, and firms from other countries.⁴

What are the factors contributing to the disconnection between the world's largest and fastest growing economy, where real GDP has grown by a factor of eight since 1991, and the world's second largest stock market? What can explain the difference between the performance of Chinese firms listed in the domestic exchanges and those listed overseas? There is very little rigorous academic research that addresses these questions, which are the main purposes of this paper. In addressing these questions we compare the performance of the Chinese market and listed firms with those of the other large developing economies—India and Brazil, and large developed economies (US and Japan), among others. In addition, we compare Chinese firms listed in the domestic A-share market and those listed overseas, as well as *unlisted* firms in China.

The answers to our key questions should help policymakers and regulators (e.g., the CSRC) to improve the efficiency and performance of the Chinese stock market. The stock market has not played a role as prominent as the banking sector in providing financing for firms and promoting economic growth (e.g., Allen, Qian and Qian, 2005; AQQ hereafter). However, the importance of this market has been growing in the past decade: without a stock market that is a viable investment alternative too many resources go into other saving vehicles, such as the real estate sector, and this has led to many costly distortions in the economy.⁵ Moreover, the stock

⁴ Over 60% of the total market cap of the Hong Kong Stock Exchange (HKSE), which follows regulations similar to those in the US and is open to global investors, comprises of companies from mainland China (“H share” market). Figure A1 shows that the buy-and-hold returns of Chinese firms listed in Hong Kong grow by a factor of 3 from 2000 to 2014. Converting stock prices to RMB slightly lowers the buy-and-hold return for H-share stocks, but it still significantly outperformed that of stocks listed in A-share.

⁵ Deng, Morck, Wu, and Yeung (2015), and Deng, Gyourko, and Wu (2012), among others, have shown that the real estate market has grown very rapidly, esp. since the 4-trillion stimulus in 2008.

market provides vital source of funding for China's growing consumption and services as well as hi-tech sectors, the main driver for China's continuing economic growth. Further development of the stock market represents one of the key tasks for China's financial system.

We focus on two aspects of the Chinese stock market—in particular, factors related to listed firms' *cash flows*—to explain its poor long-run performance and its divergence from its economic performance. Our first hypothesis is that problematic listing and delisting processes, under the control of CSRC, worsen the adverse selection of listed firms. In terms of industrial output, revenues and net income, unlisted firms, and in particular, privately owned (unlisted) firms have provided the majority of output, profits and growth of China's economy over the period 2000-2014 (Table 3). For instance, firms listed in the A share market account for only 20% of total net income of all firms in 2014. The average growth rate in net income for the unlisted sector is higher than that for the listed sector during 2000-2014. We also observe a positive and significant (at 1% level) correlation between net income growth of unlisted firms and GDP growth over this period, whereas the relationship between these two variables for the listed firms is much lower and statistically insignificant.

Since only a small fraction of firms is listed in the A share market, the selection mechanisms, as reflected in the IPO process, determine whether listed firms 'represent' the overall economy. We find that the average ROA (return on assets) of firms listed domestically is lower than that of matched (by industry and asset) of unlisted firms for the period 1998-2013; in fact, matched unlisted firms' ROA is higher than that of listed firms in all but two years during the period (Figure 6). These results suggest that the best-performing firms within an industry are not always selected to enter the A share market.

Arguably the three most well-known Chinese companies worldwide are privately owned

internet giants ‘BAT’—*Baidu, Alibaba and Tencent*; they are all publicly listed but none of them is listed in the domestic market. Each IPO must be approved by the CSRC, and in earlier years this took on the form of explicit quota every year allocated to different regions across the nation. Firms must also show profits in three consecutive years leading up to the IPO application year, among other explicit financial requirements, to satisfy listing standards set by the CSRC. Moreover, one of the stated purposes of establishing the stock market back in 1990 was to promote the privatization of state-owned enterprises (SOEs) by helping them raise funds through markets—i.e., selling shares to the public via an IPO. Hence, SOEs and firms from mature industries and those with connections to the regulators and relevant government branches are more likely to be listed, whereas privately owned firms, especially from growth industries without high, *current* profitability face much higher hurdles.

Prior research has shown that firms ‘time’ the IPO in the US, in that insiders choose the year to sell their stock to the public during which their operating performance tends to be the strongest. This phenomenon also occurs in emerging economies as both ROA and ROE (return on equity) of IPO firms drop from the highest levels in the IPO year or the year before the IPO. But IPO firms in China’s A share market have by far the largest post-IPO drop: the average ROA dropped from a high of 12% pre-IPO to just above 6% post IPO, an astonishing fall of one half. Prior studies show that IPO firms use earnings management to boost their performance before IPO. Chinese firms also use earnings management before IPO, and our evidence suggests that they use earnings boosting activities more prior to IPO than US firms and Chinese firms listed overseas.⁶ Our results are also consistent with the argument that the listing process distorts firms’ operations in that some firms exhaust their resources and sacrifice their future growth in order to

⁶ For example, Aharony, Lee, and Wong (2000) shows that Chinese firms employ earnings management. Prior research and many lawsuits also suggest outright frauds of making up revenue and profit figures in order to meet the listing hurdles set by CSRC.

meet the listing standards.

Once listed, firms are rarely delisted in China and the ‘shell’ of a listed firm is valuable given the difficult listing process. After two consecutive years of losses, listed firms in China are labeled “ST” (special treatment) but remain listed and traded in the exchanges. Compared to *delisted* firms from the U.S., ST firms in China experience similar or greater drop in performance (ROA and ROE) during the five-year period before receiving the ST status than US firms prior to their delisting. These results suggest that poor-performing firms are not dropped from the market, which worsens the adverse selection of the listed firms in the A share market.

Our second hypothesis explaining the disconnection between stock market performance and economic growth is that listed firms have low investment efficiency after IPO. Listed firms in China have much higher levels of investment (CAPEX, relative to assets) than their counterparts in the US, Japan, India and Brazil after IPO, and maintain the highest level of investment among the group of countries throughout the period 2000-2014. We measure returns on investment by firms’ *net* cash flows (= EBITDA – Changes in Working Capital – Capex) scaled by lagged assets. We find that the annual net cash flows of Chinese firms are 0.6% lower than that of firms from the other four countries. With the average net cash flows of Chinese firms around 2% of assets per year, the gap in investment returns relative to firms from other countries is economically significant.⁷ In addition, we find lower net cash flows are associated with more related-party transactions for Chinese firms, a proxy commonly used in the literature for tunneling by the controlling shareholders. Therefore, poor investment returns can be attributed to

⁷ This may reflect a problem beyond listed firms—many large scale government-led investment projects have led to misallocation of resources and generated negative returns (See Song, Storesletten, and Zilibotti (2011), and Shea, Shiu, and Wu (2015) for details).

deficiencies in corporate governance.⁸ Among listed firms, we find that SOEs have worse fundamentals (ROA, ROE and net cash flows) than listed non-SOEs.

In summary, by focusing on firms' cash flows we show that the long-run poor performance of the Chinese stock market, relative to the overall economy and markets from both developed and developing countries, is attributed to suboptimal regulations regarding firms' entry into (IPO) and exit from (delisting) the market.⁹ The current IPO procedure is an administrative process with high performance hurdles and one in which SOEs and firms from mature industries 'crowd out' privately owned firms and firms from new industries. This is despite the fact that these firms have been contributing most of the GDP growth and their role in the economy will only strengthen in the years ahead. The normative implication is that CSRC should reform the IPO procedure and move toward a market-oriented process, and encourage the listing of privately owned firms and those from growth industries. Such reform, along with better enforcement of the delisting process and continuing effort in enhancing corporate governance, can improve the mixture of firms in the market and resource allocation, and increase returns to (minority) shareholders.

The rest of the paper is organized as follows. In Section II of the paper we introduce our data sets and study the performance of the Chinese stock market and listed firms with firms and markets from around the globe. We conduct empirical tests to examine the reasons for the poor performance of the Chinese market and firms in Section III. Section IV concludes. The Appendix contains explanations of the variables used in the paper and their sources.

⁸ There is a strand of literature on law, finance and corporate governance in emerging markets, including China. For example, Cheung, Rau and Stouraitis (2006), Fisman and Wang (2010), Jiang, Lee and Yue (2010), and Li, Lu, Qian and Zhu (2015), among others, document evidence for tunneling activities conducted by Chinese firms. Atanasov, Black, Ciccotello, and Gyoshev (2010) use data from Bulgaria and document evidence for equity tunneling.

⁹ We also study and compare risk-free rates (yields on government bonds) and valuation of firms across the large economies, and conclude that they do not appear to be the reason behind the poor performance of A share market.

II. DATA SETS AND A PERFORMANCE EVALUATION OF MARKETS AND FIRMS

A key finding in asset pricing research is that, in efficient markets what moves stock prices and returns is unexpected news about firms' cash flows and/or discount rates. Accordingly, listed firms that have been contributing to China's unprecedented economic growth and have exceeded investor expectations should generate superior returns. We separately look at listed firms in the domestic A share market, and those listed overseas, mostly in HKSE and in the US (as ADRs). In a cross-country setting, we benchmark Chinese firms' returns by using both country-level information, such as GDP growth and income level, and firm-level information such as size, leverage, and cash flows. We also compare listed firms in the A share market with matched unlisted Chinese firms. Based on the tests we can conclude whether listed firms in the A share market and those listed overseas underperform the benchmark return indicated by country- and firm-level fundamentals. We then conduct tests to examine reasons for the possible underperformance of Chinese listed firms with the focus on their cash flows in the next section.

II.1. Data Source and Sample Construction

Our study requires country- and stock exchange-level information, as well as industries' and firms' financial and accounting data. Country-level data include macro-economic variables and those describing institutional environment, which may affect the performance of stocks listed in the exchange(s) of a country. We obtain most macro-economic variables from the World Bank, and adopt measures for country-level investor protection and legal institutions from the law and finance literature (e.g., La Porta, Lopez-De-Silanes, Shleifer and Vishny, LLSV 2002; Djankov, La Porta, Lopez-de-Silanes and Shleifer, DLLS 2008). Exchange-level data include variables that describe stock market characteristics, such as the turnover ratios of stocks; information is obtained from the World Federation of Exchanges.

We extract annual data on stock returns (adjusted for splits) and financial information for individual firms listed in stock exchanges worldwide from the Worldscope database, which is part of Datastream. For each listed firm, Datastream provides its listing date, listing stock exchange and country, and the country that the firm is headquartered in. To account for the effects of the time-varying exchange rates and inflation, we use stock prices that are denominated in local currencies and adjust stock returns by the year-end inflation to *real* returns. We also extract financial information to construct accounting variables for listed firms from Datastream, including firm size (total assets), returns-on-assets (ROA), return-on-equity (ROE), sales growth, investment (capital expenditure/lagged total assets), leverage (book debt/total assets), EBIT and EBIT growth, operating and net cash flows, and total accruals.

To ensure accuracy, we compare data sets on individual stock returns and firms' financial and accounting information from Datastream with those from other sources. In particular, we obtain data for listed firms in the US from Compustat and CRSP; and such information in China's A-share market from WIND and CSMAR; for stock prices and split-adjusted returns of Chinese listed firms we also use data compiled by the Chinese Capital Market Research Group (of China Academy of Financial Research).¹⁰ We cross check these datasets and find that they are mostly consistent of each other. If a firm has different values for the same variable from different databases, we turn to its annual reports to verify. We delete observations that have inconsistent records from different datasets and are difficult to verify. The final dataset includes 126,291 unique firms listed in 157 exchanges located in 101 countries over the period 1991-2014; 2,872 of these firms are currently or ever listed in the Chinese A share market (SHSE and SZSE).

Given our focus on China, we explore a number of additional sources to obtain

¹⁰ We thank Jiang Wang, Jun Pan and Grace Hu for sharing the data on Chinese stock prices and returns, and their comments on constructing return series for Chinese firms.

information on Chinese firms. First, the Chinese Industrial Enterprises Database (CIED), released by the National Bureau of Statistics (NBS), provides comprehensive coverage for firms with annual sales over RMB 5 million. We obtain accounting and financial information for unlisted firms in our comparison with listed firms from China. Second, we collect information related to corporate governance of listed firms from WIND and CSMAR, which extract such information from firms' annual reports. For example, for each listed firm, WIND provides information on the ultimate controller and percentage of shares held by the ultimate controller. CSMAR collects information about related-party transactions (RPT) conducted by Chinese listed firms in each year during the sample period, including the type of transactions and the amount of cash inflows and outflows in each transaction. In some of the analyses we use annual stock return volatilities, to construct which we obtain monthly stock returns for all listed firms from Bloomberg. As stated above, we focus on the period of 2000-2014 for firm-level tests.

Table 1, Panel A presents the number of firms listed in SHSE and SZSE and the number of Chinese firms listed in overseas markets in each year of the sample period. Column 1 shows that the number of firms increases steadily over the years, as IPOs bring new firms into the market.¹¹ Column 2 shows that the number of SOEs also increases during the same period but at a lower pace. As a result, while over 70% of all the listed firms are SOEs in 2000, this ratio dropped to below 40% in 2014. The average size of listed firms, in terms of book assets, increased from US\$250 million in 2000 to over \$1 billion in 2014. As indicated in Column 4, the number of Chinese firms listed overseas increased more than 10 times from 2000 to 2014. The proportion of SOEs in overseas-listed firms decreased from more than half (47/80) in 2002 to

¹¹ CSRC temporarily suspended new IPOs in a few years for the period November 3, 2012 to January, 2014. China's IPO market has been suspended for seven times before 2012. The suspension periods are (1) July 21, 1994 – December 7, 1994; (2) January 19, 1995 – June 9, 1995; (3) July 5, 1995 – January 3, 1996; (4) July 31, 2001 – November 2, 2001; (5) August 26, 2004 – January 23, 2005; (6) May 25, 2005 – June 2, 2006; (7) December 6, 2008 – June 29, 2009. The IPO market was suspended again from July 4, 2015 for four months. Packer and Spiegel (2016) find that suspension of IPOs didn't lower risk of the market.

around one quarter (172/661) in 2014. The mean of total assets of these firms is \$34 billion in 2014, larger than that of A-share firms.

Table 1, Panel B presents the distribution of listed firms in other large countries over the sample period. In our empirical tests below we compare listed firms in China's A share market with those listed overseas, and listed firms from the US and Japan—the two largest developed countries, as well as listed firms from India and Brazil—the two largest developing countries behind China.

II.2. The Link between Economic Growth and Stock Market Returns

We start our analyses by examining the correlation between the current stock returns in one country and its future GDP growth for the largest 20 economies based on the IMF rankings. In addition, we also examine the correlation for South Africa, a large emerging country and member of the BRICS. In Table 2, we take the 5-year rolling average stock returns (first observation starting in year t ending in year $t+4$, then starting in year $t+1$ ending in year $t+5$, ...) and 5-year GDP growth rates (first starting in year $t+1$ ending in year $t+5$, then starting in year $t+2$ ending in year $t+6$, ...) to calculate the correlations. We take the value-weight annual stock returns of firms listed in each country, with lagged-one-year market capitalization as the weight. We begin the exercise back from 2014 and end in 1991, or end in the year when a stock index is formed in a country. For South Korea and Saudi Arabia, we use stock index returns to calculate the correlation, because the index return data cover a longer period than individual stock return data that are available in our sample.

For most developed economies such as US, Japan, Germany and France, there is a strong and positive relation between stock returns and future GDP growth, suggesting that the stock market performance can predict economic growth. Such predictability also exists for large

emerging economies markets such as India, Brazil, Russia, and South Africa. The correlation is weaker for some emerging countries such as China and Mexico. The difference in correlation between China and other developed countries as a group, and the difference in correlation between China and other emerging countries as a group, are both significant at the 1% level. In particular, the correlation coefficients for both China is below 10% with large p-values indicating there is virtually no meaningful relationship between stock returns and future GDP growth over a period of twenty years.

One possible explanation for the disconnection between economic growth and stock market performance based on the results in Table 2 is that listed firms in China only account for a small fraction of the economy and they are *not* representative of the corporate sectors in the economy. With aggregate data from the *Statistical Yearbooks* published by the National Bureau of Statistics, we break down all the Chinese firms into those publicly listed and unlisted sectors, and differentiate SOEs from privately owned firms. Detailed accounting, financial and ownership information on the listed firms is from the WIND and CSMAR databases.

We report the level and growth of net income contributed by each sector in China in Table 3. As Panel A of Table 3 shows, the listed firms contributed only 19.32% of total net income among all firms in China in 2014. Unlisted firms contribute to the majority of profits and their importance among listed firms has been rising. Among the listed firms, SOEs take a lion's share (roughly 80%). Hence if listed firms as a group have not been performing well, then SOEs may have contributed a substantial part of such poor performance.

Next, we check the correlations between GDP growth and the grow rate of each sector. Not surprisingly, the corporate sector as a whole has a strong and positive correlation with GDP growth (from Panel B, correlation coefficient 0.687, significant at the 1% level). The strong

correlation is largely attributed to non-SOEs and the unlisted firms. In particular, the unlisted sector has the highest correlation with GDP growth (0.713, significant at 1% level). However, the net income growth of the listed firms shows no statistically significant correlation with GDP growth. In contrast, the correlation of net income growth and GDP growth for US listed firms from 1980 to 2014 is 0.413, statistically significant at the 1% level. These findings suggest that China's GDP growth has been mainly driven by the growth of unlisted and privately owned firms. Indeed, average growth rates of these two sectors are higher than those for listed and SOE sectors during the period of 2001-2014.

The aggregate growth rates shown in Table 3 tell us the 'extensive' margin: that is, these growth rates include the entry and exit of firms into various sectors, hence higher growth rates for unlisted sectors may be driven by the entry of new firms. We compare the 'intensive margin'—the profitability of every listed and unlisted firm, and report the value-weighted averaged ROA of the listed and unlisted sectors in Figure 6, with the contemporaneous total assets as the weight. Detailed financial, accounting and ownership information for unlisted firms, over the period of 1998-2007, is from the Chinese Industrial Enterprises Database (CIED), also released by the National Bureau of Statistics, which contains all SOEs and non-SOEs with annual sales over RMB 5 million (about US\$800K).¹ To account for changes and differences in firm size, we matched each listed firm in each year with one unlisted firm from the same industry that has closest book assets in the same year. To ensure the size of listed and unlisted firms is as close to each other as possible, we also require the ratio of the book asset of one listed firm to that of its matched unlisted firm within the range [80%, 120%]. Imposing this restriction, for the period 1998-2013, we have 2767 distinct listed firms matched with one unlisted firm each. As Figure 6 shows, the matched unlisted firms have higher ROA than listed firm in most of the

years. In an untabulated table, the average growth rate of both revenue and earnings measured by EBIT or net income is also higher for unlisted firms than that for listed firms in most of the years from 1998 to 2014. This result provides us with further evidence that the unlisted sector has contributed more to the profits of the corporate sector in China.

II.3 The Performance of the Chinese Market and Listed Firms

Figure 2 shows the performance of the Shanghai Stock Exchange Composite (SSE) index and the stock indices of other large countries from 1992 to 2014. We normalize all indices to one in the starting year 1992, and cumulate the index returns by year. We account for the inflation impact by adjusting the nominal returns with year-end CPI to obtain cumulative returns in real terms. By the end of 2013, the buy-and-hold return of the SSE index is slightly above one, meaning that an investor who put one dollar in a value-weighted portfolio of stocks listed in SSE in 1992 would realize a net real return of zero. The SSE index run up when approaching the end of 2014, however, the cumulative index return is still lower than other emerging countries like Brazil and India, and also lower than that of US. It only outperformed the Nikkei Index of Japan.

As shown in Figure 2, the SSE index saw negative real returns in most of the 1990s. Besides the fact the stock prices in nominal terms in this period have little growth, another reason could be that the inflation is high. Figure 3 shows that the inflation rate is indeed quite high in the first half of 1990s in China, with the CPI reaching 27% in mid-1994. Because of the high inflation rate as well as the anecdotal evidence showing that speculative activities were prevailing in China's market, we are more interested in the stock market performance in the period after 2000. In addition, the number of listed firms increased sharply from 13 in 1991 to 1,041 in 2000. Major securities laws and regulations were introduced in late 1990s, and the

intensity of adding new firms to the exchanges started to slow down after 2000. For all above reasons, we conduct our analysis in the period after 2000.¹²

Figure 4 shows the buy-and-hold returns over the period 2000-2014 in China, Brazil, India, US and Japan. The buy-and-hold returns (BHR) are calculated as cumulative annual stock returns, which are averaged across firms by year with the market capitalization in the previous year as the weight; inflation is adjusted by using the value of local currencies in 2000 as the base currency. We also include cash dividends in the calculation of BHR. If an investor invested one dollar in a value-weighted portfolio composed of Chinese listed stocks in 2000, she would have her portfolio value less than one dollar by the end of 2014, virtually generating zero net real return over the 14-year horizon.¹³ In contrast, one-dollar investment in a worldwide, diversified, value-weighted stock portfolio in 2000 generates \$1.38 by the end of 2014 if cash dividend is included. As shown in Figure 4, the value-weighted BHR of stocks listed in China is remarkably lower than that of other large emerging markets like India and Brazil, both of which see their stock prices increase by a factor of around three from 2000 to 2014. The BHR of China over the period 2000-2014 is even lower than that of Japan, which suffered from prolonged contraction in the economy and financial markets. The most comparable group to the A-share listed firms could be the Chinese firms listed in overseas stock exchanges, as they are both from China and thus share the same macro-economic environment in their headquarter country. Figure 4 shows that the value-weighted portfolio of Chinese firms listed overseas substantially outperform that of A-share stocks in the 2000-2014 period. The buy-and-hold return is as high as 2.8 by the end of

¹² Carpenter, Lu and Whitelaw (2016) examine the period of 1992-2012 and find that the Chinese market is efficient in the sense that prices impound information about the firm fundamentals and pricing related information quickly. They also find that the Chinese market has positive ‘alpha,’ derived from an international factor model (e.g., Fama and French, 2012).

¹³ Very few Chinese firms pay cash dividends. In 2011, based on Bloomberg data, the average dividend yield for the Shanghai Composite Index was 2.2% (relative to the earnings). CSRC has been urging listed companies to pay out cash dividends to their shareholders (e.g., *Financial Times*, January 8, 2013).

year 2014.

So far we have compared the stock performance in China and in other major countries. Next we compare the returns on investing in Chinese stocks versus other investment channels such as bank deposits. Since the large banks are all majority-owned by the government, the deposit rates are effectively risk-free rates. Although the nominal five-year deposit rates increased from 2.88 in 2000 to 4.84 in 2014,¹⁴ the real deposit rates did not; similar patterns are found for one-year deposit rates. The nominal demand deposit rates consistently declined, resulting in negative demand deposit rates in most of the years. We accumulate the deposit rates and plot the cumulative returns in Figure 5. Again we account for inflation by converting nominal returns to real returns. Apart from the year 2007 when the cumulative stock return exceeds the cumulative deposit rates, in the rest of the years, the cumulative stock returns significantly underperformed the cumulative five-year deposit rates. It is even lower than the cumulative one-year deposit rates in most of the years.

Given the extraordinary growth of China's economy, the poor performance of its stock market has been striking. To explore factors that may affect country-level stock performance, we estimate a prediction model using firm-level, exchange-level and country-level variables. The set of variables include: (1) country-level macro-economic conditions such as GDP growth, GDP per capita, the amount of credit from financial institutions to GDP ratio, etc; (2) stock market characteristics, especially liquidity and risk; (3) firm-level financial performance and characteristics; (4) investor protection measures developed by previous law and finance literature (La Porta, Lopez-De-Silanes, Shleifer and Vishny, 2002; Djankov, La Porta, Lopez-de-Silanes and Shleifer, 2008), including the anti-self-dealing index, prevalence of tax evasion ("tax

¹⁴ Peoples' Bank of China, the central bank of China, announced that it will no longer publish the base rate for 5-year deposits since November 22, 2014 (<http://www.pbc.gov.cn/zhengcehuobisi/125207/125213/125440/125838/125888/2943013/index.html>).

evasion”) and the effectiveness of judicial procedure (“time to collect on a bounced check”). All explanatory variables are lagged by one year when entering the regressions.

Table 4 presents the ordinary least squares (OLS) estimates of the prediction model of firm-level annual stock returns. We exclude countries that have fewer than 20 stocks in a given year. The prediction model is estimated for the 1991-2014 period and the 2000-2014 period. The independent variable of interest in Columns 1, 2, 5 and 6 is *Listed in A-Share*, a dummy taking one if the firm is listed in Shanghai or Shenzhen stock exchanges. In columns 1 and 5, we include country-level and exchange-level explanatory variables only. The negative coefficients of *Listed in A-share* indicator show that firms listed in mainland China have substantially lower stock returns, when exchange-level and country-level characteristics are being controlled for. On average, firms listed in China underperformed firms listed in other countries by 7.1% in annual returns for the period 1991-2014. The underperformance is even more severe for the period 2000-2014, which is shown by the significant and negative coefficient 10% in Column 5. The regression results suggest that the underperformance is not explained by country-level institutional features, nor is driven by any year or industry fixed effects.¹⁵ In columns 2 and 6, we allow firm-level explanatory variables to enter the specifications. The negative coefficients of the *Listed in A-Share* dummy become statistically insignificant, suggesting that the underperformance of the firms listed in A-share can be attributed to firm characteristics.

The independent variable of interest in models 3, 4, 7 and 8 is *Chinese Firms Listed Overseas*, a dummy taking one if the firm is headquartered in mainland China and listed in overseas markets such as US and Hong Kong. As the insignificant coefficients in Columns 3 and 7 show, the average annual stock returns of Chinese firms listed overseas are not distinguishable

¹⁵ We also run similar regressions (not reported) on (annual) Sharpe Ratio, and find that the Sharpe Ratios for firms listed in China are 0.66 lower annually in the period 2000-2014.

from firms listed other countries. The contrasting coefficients of *Listed in A-Share* and *Chinese Firms Listed Overseas* provide clear evidence that A-share firms not only underperform foreign firms listed in other countries, but they underperform their counterparts headquartered in China but listed overseas. This suggests that the underperformance of A-share firms is not simply because they are Chinese firms and share the same economic fundamentals in China, but possibly due to reasons that are related to the listing procedure in mainland China.

As shown by the estimation results in Table 4, firms with smaller size, lower leverage, higher profitability and higher EBIT growth see a larger annual stock returns on average. At country-level, higher GDP growth and larger credit extended by financial institutions scaled by GDP are associated with better stock performance. Other country-level variables do not have significant impact on stock returns in most of the times.

As discussed above, the A-share market in Mainland China is composed of stocks listed on the SSE and SZSE. In our sample, stocks listed in the Hong Kong Stock Exchange (HKSE) are *not* counted as Chinese stocks. But the majority of the stocks listed in Hong Kong are Chinese firms. We find that the stock index in Shanghai and Shenzhen exchanges (here we only consider the main board) tracked closely in most of the years during our sample period. Stocks from SSE, where most of the large SOEs are listed, started to underperform those from the SZSE and HKSE since the 2008 global financial crisis. By the end of 2014, SSE index shows the lowest BHR (0.87); SZSE has the BHR of 1.48; HKSE is ranked highest among the three, with a BHR around 3.2; which means investors earn positive real returns if they buy the HKSE portfolio in 2000 and hold it until 2014.

Besides the main boards of SSE and SZSE, the Chinese stock market also comprises of the SME (small-and-medium sized enterprises) Board and the GEM (growth enterprise market)

Board. We further compare the performance of Shanghai Composite Index, the CSI300, which covers the largest 300 stocks by market capitalization from Shanghai and Shenzhen exchanges, and the SME Composite, which covers stocks listed in SME Board. We start the comparison from 2005 because the CSI 300 Index was introduced then. From 2005 to 2014, the SME Composite shows the highest cumulative returns followed by CSI300, and the Shanghai Composite is at the bottom. The results show that SME has better stock performance than large firms in the main boards. The GEM Composite introduced on June 1, 2010 shows higher volatility than Shanghai Composite in 2010-2014.¹⁶

III. EXAMINING REASONS OF THE POOR PERFORMANCE OF CHINESE LISTED FIRMS

Having established the result of underperformance of listed firms in China's A share market in the previous section, we now examine reasons behind the poor performance, focusing on firms' cash flows. One reason is the IPO mechanism that may have worsened the adverse selection problem of firms entering and exiting the market. The other reason is investment efficiency, and whether low cash flows are related to deficiencies in corporate governance. We also examine other factors and provide a discussion of our results.

III.1 The IPO Process in China's A Share Market

We have shown in Figure 6 that unlisted firms have better operating performance than listed firms in most years during 1998-2013 in terms of ROA. We find similar pattern for ROE in an untabulated table. This is our first evidence showing that in China, listed firms may not be the

¹⁶ Although the SME board allows firms that have smaller size and fewer tradable shares to be listed, the regulator still established a set of requirements that the firms must satisfy to be listed on the SME board. For example, the book value of equity before listing should be no less than RMB 30 million, and no less than RMB 50 million after listing. Firms should have positive net income in the latest three consecutive years, and the cumulative net income should be no less than RMB 30 million.

best performing firms. The IPO process can be problematic in twofold. First, the IPO selection process may not be an effective one, in the sense that firms that performed relatively worse are selected to be listed while some really good firms are rejected. Second, the IPO process adversely affects firms' incentives, which may lead to firms' deteriorating performance after IPO. In this case, even if good firms are selected to be listed, the stock performance can become poor if their operating performance becomes worse after IPO.¹⁷

Table 5 shows the international comparison of changes in operating performance around IPO for the listed firms in China and in other markets. The dependent variables are the changes in ROA, ROE and ROS in years around IPO. Panel A demonstrates that compared with firms listed in other large countries (US, India, Brazil and Japan), firms listed in A-Share (China) see their ROA drop more by 0.04 in the IPO window [-1, +1], controlling for listing firm characteristic prior to IPO and listing country characteristics after the IPO. We observe similar drops in ROE and ROS in the same window and alternative window [-2, +2]. In all specifications we control for calendar year and the level-2 industry fixed effects based on Datastream industry classifications. Thus, the observed larger drops in the earnings of listed firms in China are not some phenomenon specific to certain year or industry. One concern is that the bigger drop in ROA and ROE could be because Chinese firms raise more capital in IPO. To address this concern, for each listing firm, we control for the change in cash holdings scaled by book assets during [-1, 0] to proxy for proceeds raised in the public offering. The negative coefficients of the A-share dummy remain significant.

¹⁷ Loughran and Ritter (1997), and Teoh, Hong, Welch and Wong (1998), among others, document the earnings drop after IPO and the deteriorating operating performance for IPO firms, while it is not clear whether the phenomenon is more severe for firms listed in China. Leuz, Nanda and Wysocki (2003) constructed earnings management scores for 31 countries while China is not included in the sample.

To detail the analysis, we separate the firms into different cohorts by their listing year. We classify firms into four groups: cohort 2000-2003 (firms which did IPO in 2000-2003), cohort 2004-2006, cohort 2007-2009 and cohort 2010-2014. We examine the operating performance of the four cohorts around their IPO year. Firms in all four cohorts show similar decline in ROA and ROE in the post-IPO years, suggesting that the deteriorating performance is not a phenomenon specific to firms that are publicly listed in certain years.¹⁸

Panel B of Table 5 shows the regression results of changes in the same operating performance measures for Chinese firms listed in A-share and Chinese firms listed in overseas stock markets. Similar with the results in Panel A, Chinese firms listed in A-share see greater drops in ROA, ROE and ROS than Chinese firms listed overseas in both windows [-1,+1] and [-2, +2] around IPO. The comparison of A-share firms and their counterparts listed overseas suggest has well controlled for the headquarter country effects. Therefore, the results suggest that the significant drop in operating performance of A-share firms is not due to characteristics of Chinese firms, instead, it could be related to problems of the listing process in the A-share market.

The substantial drop in operating performance of listed firms could be related to the firms' earnings management activities in the years before IPO, as firms have to meet a set of strict listing standard set by regulators in China.¹⁹ Another even more severe concern is that these strict

¹⁸ We also examine separate firms by whether they are state-owned. Based on the ultimate controller and ownership information provided by CSMAR, the listed firms can be classified into the following categories: (1) firms controlled by the central State-owned Assets Supervision and Administration Commission (SASAC); (2) firms controlled by the local SASAC; (3) firms controlled by the Ministry of Finance; (4) firms controlled by other government agent; (5) non-state-owned firms. We find that both state-owned and privately-owned firms see substantial decline in their operating performance.

¹⁹ According to the regulations on IPO issued by the CSRC on May 17, 2006, to be listed in the stock exchanges in China, the firms are required to have positive earnings in the three consecutive years prior to the IPO or have accumulated at least 30 million net income. In addition, the firms are required to have accumulated net cash flows over 50 billion or revenue over 300 million in the three years prior to IPO. http://www.gov.cn/flfg/2006-05/18/content_283660.htm; http://www.csrc.gov.cn/pub/zjhpublic/cyb/200911/t20091117_170416.htm

requirements on firm operations and earnings may have distorted these listed firms' incentives, making them pursue short-term profits at the cost of sacrificing long-term growth. Under the pressure from the regulators, the firms may have exhausted their resources in order to meet the earnings requirement prior to IPO, and thus see such great drops in earnings in the IPO year and afterwards. We explore the earnings management concerns further later.

The Delisting Process

An important feature of Chinese stock market is that firms are rarely delisted. Around 20 stocks (or 1%) are delisted from the stock market in China every year, and fewer than 10 of them are delisted due to negative earnings.²⁰ This percentage is far below the average of other markets, which is around 10%-20% per year. We examine whether the delisting mechanism is inefficient and whether the delisting mechanism has contributed to the poor performance of the Chinese stock market.

Ideally we should compare the operating performance of firms when approaching delisting in China and in other countries. But the small number of delisting cases in China makes the direct comparison hard to conduct. Alternatively, we compare firms that received special treatment ("ST") in China and firms delisted in US due to reasons that are similar for Chinese firms to receive ST, i.e., delisted due to liquidation or being dropped.²¹ This restriction leaves us with 295 distinct firms delisted from US stock exchanges. Among the more than 2000 listed firms in China, 527 firms ever received "ST", and 82 of them are permanent "ST".²² To make a sensible comparison, we compare only permanent "ST" in China with the delisted stocks due to liquidation or being dropped in the US. This leaves us with 295 distinct firms that are delisted

²⁰ Other and more common delisting reasons include M&A, privatization, etc.

²¹ According to CRSP, US firms can be delisted due to the following reasons: merger, exchange, liquidation, dropped, expire and become foreign listed.

²² There are "temporary ST" and "permanent ST" in China. The former refers to firms that receive special treatment and re-emerge from it later. The latter refers to firms that receive special treatment and never re-emerge from it.

from US stock market. We define the year when the firm is delisted, or receives “ST” as year 0. We require the firm financial information available from five years before the delisting (“ST”) until the delisting (“ST”) year.

Figure 7 shows that the ROA of “ST” stocks in China dropped significantly from two years before the “ST” year, and the delisted stocks due to liquidation or being dropping in US see their ROA become negative from four years before delisting. The two groups of firms see similar level of ROA from year -2 to the delisting year. Put differently, if listed in the US, the “ST” firms should have been delisted from the exchange. The comparison results suggest that the delisting process in China is likely to be inefficient, because some of the Chinese listed firms perform even worse than the delisted firms in other countries, but they keep existence as listed firms for long. These poor performing firms existed in Chinese market and have contributed to the poor stock performance.

Earnings Management of Listed Firms around IPO

We further examine what explains the substantial drop in operating performance for Chinese firms in the post-IPO era. One possibility is that to meet the listing criteria, Chinese firms may exploit all resources before IPO to generate high profits. As long as the firm becomes listed, all growth opportunities have been used up and performance starts to deteriorate. Following Aharony, Lee and Wong (2000), we construct variables to measure such “financial packaging” by firms.

To examine this hypothesis, we compare the earnings management measures around IPO of listed firms in China and US. We have shown that firms listed in China see greater drop in earnings than other large countries in the IPO year. We now investigate the source of the substantial drop in earnings. Because operating cash flow (OCF) is calculated as EBITDA –

Income Taxes – Total Accruals, we can understand the change in earnings as comprised of two components: change in total accruals and change in the OCF. Total accrual is calculated as change in net current assets: Δ Current Assets - Δ Current Liabilities, in which Δ Current Assets is the change in current assets for two consecutive years, and Δ Current Liabilities is constructed in a similar way. One major component of current assets is account receivables. Therefore, a decline in total accrual is likely to represent deteriorating credit sales, and a decline in OCF is likely to represent deteriorating cash sales.

We report the comparison results in Table 6. We conduct the comparison for the year window [-1, +3] around IPO. Total accruals, operating cash flows and change in account receivables are all scaled by contemporaneous sales (revenue) to account for size effect. Firms listed in China see significantly lower accruals than firms listed in US in the years after IPO. However, firms listed in China do not underperform firms listed in US in terms of operating cash flow. The finding suggests that the poor operating performance of firms listed in China after IPO is due to the declining accounting accrual. Furthermore, we find that firms listed in China see their account receivables declining more than firms listed in US after IPO, consistent with our expectation that Chinese firms are less able to extend credit sales after listing. Taken together, the results suggest that before going public, Chinese firms boost up their earnings by extending sales, however, the accelerated credit sales are temporary and have to cease after IPO as resources may have been exhausted before IPO. That is why we observe lower Δ AR/Sales for firms listed in China after IPO. The production distortion helps explain the poor stock performance in the long run.

Panel B of Table 6 presents similar comparison results for Chinese firms listed in A-share and Chinese firms listed overseas. The findings are similar. As both groups of firms are

headquartered in China, this set of comparison better controls firm characteristics and economic environment in the headquarter country prior to IPO. Before IPO, total accruals and the change in account receivables of A-share firms are larger than those of their counterparts listed in overseas market. However, in the post-IPO era, Chinese firms listed in A-share see their total accruals-to-sales ratio 0.058 lower than that of Chinese firms listed overseas on average for the year window $[0, +3]$ after IPO. The comparison results in Panel B suggest that earning management, or financial packaging of Chinese firms, are not explained by differences in firm feature that is driven by characteristics of the headquarter country. Instead, it is associated with the listing place and the listing process. The standards set up in the A-share market may have driven Chinese firms' earnings management related to financial packaging.

We further explore whether the earning management is specific to certain industry or pervasive among all sectors. We compare the earnings management measures we use in Table 6 by industry for China and US. We find that Chinese firms in most industries show more severe earnings management than US listed firms. In particular, firms in utilities, financial, and healthcare sector underperform their counterparts in US most in terms of total accruals and change in account receivables. If we exclude listed firms in the three industries from the sample, the buy-and-hold returns of firms listed in A-share would be significantly improved, especially for years after 2010, indicating that earnings management have contributed to the poor stock performance of A-share listed firms.

III.2 Investment and Tunneling

Although firms listed in A-share have lower operating performance than firms listed in other countries, the listed firms in China are still making positive earnings. The next question is why the positive earnings are not accumulated to generate higher valuation for firms. One

possible explanation is that firms listed in China make larger but less efficient investment, which consumes their earnings and leads to zero or negative cash flows. We compare investment size and net cash flows of firms listed in China and other large countries, and Chinese firms listed overseas by calendar year in Figure 8.

As Panel A1 shows, firms listed in A-share see a higher capital expenditure-to-total assets ratio (around 8%) than firms listed in other countries for most of the years (around 2-4%). Panel A2 shows that firms listed in A-share also invest consistently more than Chinese firms listed overseas. If the investment is an efficient one, then larger investment should generate more net cash flows (at least positive cash flows) in the long run.²³ Panel B of Figure 8 compares the value-weighted average net cash flows generated by A-share firms and firms listed in other countries from 2000 to 2014, with the year-end book assets as the weight. As Panel B1 shows, A-share firms generate lower net cash flows than listed firms in other emerging countries like India and Brazil in most of the years. The net cash flows of A-share firms start to drop from 2006 and bottomed in 2010. In 2010, China is the only one out of the 5 large countries that see negative net cash flows in their listed firms. After 2010, Chinese firms consistently see lowest net cash flow among the 5 countries.

We examine firm investment and cash flows in a multivariate setting in Table 7. Column 1 of Panel A confirms that firms listed in A-share invest more than firms listed in other large countries. Column 2 shows that firms listed in A-share do not underperform firms listed in other countries in terms of operating cash flow,²⁴ when firm characteristics such as asset size, leverage, earnings and growth in the prior quarter are being controlled for. However, the coefficient of the *Listed in A-Share* dummy is significantly negative in the net cash flow regression as shown in

²³ Net Cash Flow is calculated as EBITDA – Change in Working Capital – Income Taxes – Capital Expenditure.

²⁴ Operating Cash Flow is calculated as EBITDA – Change in Working Capital – Income Taxes.

column 3, which is consistent with our observation in the univariate analysis. As year and industry fixed effects have been controlled for, the underperformance is not specific to certain time period or industries, but a pervasive phenomenon for all industries and for the whole sample period.

Panel B presents the regression results of investment and cash flow for Chinese firms *only* listed in A-share and Chinese firms listed overseas. We are interested in two groups of Chinese firms that are listed overseas: one is those *only* listed in foreign markets (“foreign-listed”); the other is those listed in *both* A-share and overseas markets “cross-listed”. Foreign-listed firms have similar levels of investment and operating cash flow to those listed in A-share only. However, foreign-listed firms generate higher *net* cash flow. Column 1 shows that cross-listed firms make less investment than firms listed in A-share only, while they generate similar levels of operating cash flows and net cash flows. These findings may suggest a higher investment efficiency of foreign-listed firms and cross-listed firms. Our findings are consistent with Doidge, Karolyi, Lins, Miller and Stulz (2009) that cross-listed firms benefit from more constraints and enforcement actions that help improve corporate governance.

Figure 9 compares investment and net cash flows of firms listed in China, firms listed in US, and Chinese firms listed overseas around IPO. Panel A plots the capital expenditure scaled by lagged book assets around IPO. A-share firms immediately double their capital expenditure one year after IPO (from 0.03 to 0.07), and maintain it at the same level in the subsequent years. In contrast, US firms see a much smaller increase in investment (from 0.03 in year 0 to 0.045 in year +3) and keep it stable afterwards. Firms listed in A-share also invest more than Chinese firms listed overseas during the post-IPO period.

Panel B shows the consequence of the larger increase in investment by A-share firms: compared with US listed firms and Chinese firms listed overseas, A-share listed firms see both a lower level and greater drop in net cash flow after IPO. If the investment is efficient, we should observe a temporary drop in net cash flow which would recover in subsequent years. However, A-share firms show steadily lower net cash flow level than their counterparts listed overseas in the post-IPO years. The lower post-IPO net cash flow suggests that A-share firms make larger but inefficient investment after getting listed.

Apart from over-investment, related-party transactions (RPTs) may have also contributed to the lower net cash flows of A-share firms. A line of literature including Li, Lu, Qian and Zhu (2014) documents that controlling shareholders of listed firms divert assets by providing loan guarantees to their subsidiaries or related parties, or by paying for the debt and expenses. These tunneling-related activities may be associated with related-party transactions (RPTs). The most common related-party transactions involve the buy and sell of goods and labors to related parties such as large controlling shareholders, while other activities may also be relevant, such as leasing, mergers, asset spinoffs, etc. The related-party transactions can result in cash outflow or cash inflow. If cash outflow exceeds cash inflow, and the money spent in PRT activities is never paid back, then firms would see lower net cash flows associated with RPT activities.

We obtain the related-party transaction information from CSMAR. This database provides the type, amount, direction and date of all transactions of A-share listed firms. We calculate the net RPT outflow by subtracting the aggregated money inflow from the total amount outflow for each firm in each year. This net RPT outflow measure is scaled by book assets measured in the same year. Then we regress the firm's investment size and net cash flow on the lagged-one year RPT net outflow amount.

The estimation results in Panel A of Table 8 show that the lagged RPT net outflow is insignificantly associated with investment. Panel B shows that the lagged RPT net outflows are negatively associated with net cash flows in the next period, suggesting that related-party transactions indeed lead to permanent cash outflows and finally diminish firms' net cash flows in the long run. This finding suggests that the money spent in investing activities by Chinese firms may not be used in value-enhancing investment projects, but likely to be transported to their related parties like large shareholders. In the meanwhile, the associations are stronger for non-SOEs, indicating that RPT is a more important contributing factor to low net cash flows for non-SOEs. The coefficients of the interaction term of RPT Net Outflow and Cross-listed dummy are significant and negative in Columns 2 and 4, suggesting that the sensitivity of net cash flows to changes in money outflow in RPT activities is higher for cross-listed firms.

Which types of firms in China have contributed more to the poor performance Chinese stock market? We decompose the listed firms into SOEs and non-SOEs, and compare their stock performance, operating performance and cash flows with other listed firms in China. By reading the "ultimate controller" information provided by WIND, we classify all SOEs into those controlled by the central State-owned Assets Supervision and Administration Commission of the State Council (SASAC) or by the Ministry of Finance ("central SOE"), those controlled by the local SASAC ("local SASAC"), and those controlled by all other government sectors ("other SOE"). When conducting the regressions, we keep all listed non-SOEs in the sample, and allow all types of SOEs, the group of central SOEs, the group of local SOEs and the group of other types of SOEs to enter the sample one by one from columns 1 to 4. Therefore, the dummies representing different types of SOEs essentially capture the differences between non-SOEs as a group and a certain type of SOEs we are interested in.

Panel A of Table 9 shows that on average, SOEs show lower stock returns than non-SOEs by 2.1% per year. Central SOEs see most underperformance by 2.6% compared with non-SOEs. Panel B shows that SOEs generate lower earnings than non-SOEs by 0.009 (or 13.2% relative to the mean of non-SOEs). Panel C shows that SOEs generate lower net cash flows than non-SOEs by 0.023 (or 28.7% relative to the mean of non-SOE). Among all types of SOEs, those ultimately controlled by the central SASAC see most severe underperformance in terms of both earnings and net cash flows. These findings are consistent with Chen et al (2015), which argue that SOEs allocate more capital to units with worse investment opportunities, and minority shareholders suffer as a result. Our findings suggest the listed SOEs in China have more severe problems in their investment efficiency and issues related to corporate governance.²⁵

Which industries may have contributed most to the poor performance of Chinese stock market? We group all A-share listed firms into nine industries based on the CSRC industry classification and examine which industries have “too many” firms listed in A-share. Panel A of Table A2 lists the percentages of sales generated by firms in each industry out of sales generated by firms from all industries in each year for all industrial sectors in China, including both listed and unlisted firms. Panel B lists the percentages of sales calculated in the same way for only listed firms in A-share. Comparing the numbers in the two panels, we find that “Construction and Mining” and “Oil and Gas” may have been “over-listed” in A-share: although firms from “Construction and Mining” contribute 11% of sales out of all firms in the economy, they account for 16% in the listed-firm sample. Similarly, firms from “Oil and Gas” contribute merely 1% sales out of all firms in the economy, however, they account for more than one quarter in the

²⁵ Our findings are consistent with previous studies on China’s state sector. For example, Fan, Wong and Zhang (2007) find a negative relation between CEO political connection and the firm’s post IPO performance. Wang, Wong, and Xia (2008) document that state-owned firms tend to hire local auditors, which may result in weaker corporate governance of SOEs. Besides stock returns and earnings, we also provide evidence on cash flows of Chinese SOEs.

listed sample. By contrast, firms from “Consumer Goods” and “Wholesale” may have been under-listed in A-share.

III.3. Discussion

Risks

An alternative explanation for the long-run underperformance of the Chinese stock market is that Chinese listed firms have lower risks. We control for the cumulative stock return volatilities in the stock return regressions (Table 4), and find that the underperformance of the listed stocks in China still remains. To further account for risks, we calculate the volatilities of stock prices using the monthly stock returns extracted from Bloomberg. The volatility of Chinese stocks is lower before 2003, and gradually grew to be the highest among large countries: US, India, Brazil and Japan in 2006-2008. It declined after 2008 but still higher than some emerging markets like Brazil. Therefore, the risk hypothesis does not seem to explain the underperformance of Chinese stocks.

Interest Rates and Valuation

If interest rates rise, then market values would drop for given assets and cash flows. Thus, another explanation of the decreasing market values despite the inflow of cash is that the interest rates have been rising. In fact, the interest rates in China have fallen over years since 1990s. Table A1 shows that the real demand deposit rates adjusted for inflation decline from 0.73% in 2000 to -1.63% in 2014. The 1-year deposit rate in 2014 is 1.12%, lower than the level at 1.99% in 2000. The 5-year deposit rates also did not increase over the years. Figure A2 compares the real interest rates of the 5-year government bond for China and other large countries. The real interest rates for China are higher than Japan but in line with those of US and India. Overall, we don't find evidence that China has higher level or growth rate of real interest rates than other

larger countries over the sample period.

Figure 10 plots the valuations of listed firms over the sample period. We construct the value-weighted average market-to-book ratio by country-year. We aggregate the market capitalization across stocks within a country and divide it by the aggregated book equity of their issuing firms. Since the market capitalization is at the stock level, for firms listed in more than one stock exchange, we multiplied the firm-level book equity by the ratio of market capitalization of a stock listed in one exchange relative to the total market capitalization of its issuing firm to obtain the stock-level book equity in that listing exchange. In this way we ensure the consistency of the measurement of the denominator and the numerator. As can be seen from plot, the market-to-book ratio of Chinese stocks declined in early years of 2000s. It reversed the trend in 2005 and spiked in 2007, which is perceived to be a bubble of Chinese stock market, because the split-share reform is almost completed then and the anticipation of stock investors is high, which may explain the higher valuation in 2007.²⁶ It dropped later after 2009. Overall, the average market-to-book of Chinese stocks is not the lowest among the 5 large countries, suggesting that poor stock performance of A-share firms is not due to lowered valuation of firms by investors.

IV. CONCLUSION

The starting point of our paper is the disconnection between China's economic growth and the performance of its domestic stock market, established in 1990. The Chinese economy, the largest in the world in PPP terms, has been the fastest growing globally for the past three decades. The size of the equity market, including stocks listed and traded in Shanghai and Shenzhen, is the second largest in the world, and listed firms that contribute to the exceptional growth and have exceeded expectations should deliver superior long-run returns to investors.

²⁶ See Cheung, Jiang, Li and Wang (2011) for details about the split-share reform in China.

During 2000-2014, the period of focus for our paper, the Chinese market is one of the worst performing markets in the world in terms of buy-and-hold returns. Investors earned no real returns, which are worse than returns from (five-year) bank deposits and government bonds.

Our goal is to understand the poor performance of China's stock market and its divergence from economic growth. We focus on two related aspects of the market. First, we examine the IPO and delisting mechanisms, which determine the pool of listed firms. Each IPO must be approved by the CSRC, and it sets high financial hurdles for entry into the market. Moreover, one of the stated purposes of establishing the stock market back in 1990 was to promote the privatization of SOEs by helping them raise funds through markets. Hence, SOEs and firms with connections to the regulators and relevant government branches are more likely to be listed, whereas privately owned firms without current profitability face much higher hurdles.

We find both ROA and ROE of IPO firms in China, US, Japan, Brazil and India all drop from the highest levels in the IPO year (or the year before the IPO), but listed firms in China have by far the largest post-IPO drop. We also find that Chinese firms also use earnings management before IPO, and the degree of manipulation is greater than their US counterparts. Once listed, firms are rarely delisted in China and the 'shell' of a listed firm is valuable given the difficult listing process. Hence, problematic IPO and delisting processes exacerbate the adverse selection of firms entering and exiting the market.

Second, we examine listed firms' investment efficiency by looking at their investment levels and cash flows. With much higher levels of investment compared to listed firms from the US, Japan, India and Brazil, Chinese firms generate lower net cash flows, implying low investment efficiency. Lower cash flows are associated with more related-party transactions for Chinese firms, indicating deficiencies in corporate governance.

Our most important policy implication is that the CSRC should substantially lower the financial hurdle for IPO, and encourage more privately owned firms, especially those from growth industries to enter the market. CSRC has realized this and is undergoing an important reform: shifting the IPO process from an administrative procedure controlled by the CSRC to one that is controlled by the stock exchanges and monitored by the market. Our results indicate that this reform should be implemented immediately. This would improve the quality of the mix of firms listed in the market. Our results also suggest that the CSRC should tighten the rules of delisting poor-performing firms. Finally, continuing efforts in improving corporate governance is also needed in order to enhance investment efficiency.

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Appendix
Data Sources and Variable Definitions

Variable	Definition
<i>CAFR-Chinese Stock Market Research Project</i>	
Stock Returns of Firms Listed in A-Share	Annual stock returns of firms listed in Shanghai or Shenzhen stock exchanges (A-Share), adjusted for stock split and inflation (measured by year-end CPI)
<i>Datastream</i>	
<i>Stock-level Variables</i>	
Stock Returns of Firms Listed in Other Countries	Annual stock returns of firms listed in countries other than China, adjusted for stock split and inflation (measured by year-end CPI)
<i>Firm-level Variables</i>	
ROA	EBIT in year t/total assets in year t
ROE	Net Income in year t/total book equity in year t
ROS	EBIT in year t/total sales in year t
Operating Cash Flow (OCF)	EBITDA – changes in working capital – income taxes
Net Cash Flow	Operating cash flow – capital expenditure
Leverage	Total debt in year t/total assets in year t
Earnings Growth	(EBIT in year t - EBIT in year t-1)/EBIT in year t-1
Sales Growth	(Gross sales in year t - gross sales in year t-1)/gross sales in year t
Total Accrual	Δ current assets - Δ current liabilities
<i>Country-level Variables</i>	
Value-Weighted Buy-and-Hold Returns	Cumulative annual stock returns with the market capitalization in the prior year as the weight. For each year, we calculate the real value-weighted stock returns for all firms listed in each country. Stock returns are adjusted for inflation measured by the year-end CPI. For firms issuing stocks listed in more than one exchange, the weight is market capitalization of the stock in each exchange. Then we cumulate the value-weighted stock returns over years to obtain the buy-and-hold returns. The BHR is set to be one in the starting year
P/E	The aggregated market capitalization of all stocks listed in a country over the aggregated net income of the listing firms in this country. We aggregate stock-level net income as the denominator. For firms listed in more than one exchange, the firm-level net income is split to stock-level net income by the weight of its market capitalization in one exchange out of total market capitalization in all exchanges it is listed in. We multiply the firm-level net income by the weight to obtain the stock-level net income.
M/B	The aggregated market capitalization of all stocks listed in a country over the aggregated book equity of the issuing firm. We aggregate stock-level book equity as the denominator. For firms listed in more than one exchange, the firm-level book equity is split to stock-level book equity by the weight of its market capitalization in one exchange out of total market capitalization in all exchanges it is listed in. We multiply the firm-level book equity by the weight to obtain the stock-level book equity.
EBIT of Listed Firms/GDP	The total EBIT of listed firms in a country over its GDP in the same year
<i>WIND</i>	
SOE	Firms that are ultimately controlled by the central State-owned Assets Supervision and Administration Commission of the State Council (SASAC), local SASAC, Ministry of Finance, or other government agents. Other types of ultimate controller include: other non-enterprise organizations, universities, group companies, natural person, etc.

Appendix – Cont’d
Data Sources and Variable Definitions

Variable	Definition
<u>CSMAR</u>	
RPT Net Outflow	The amount of money outflow minus the amount of money inflow in related-party transactions of each Chinese listed firms in a given year
<u>Compustat</u>	
	We extract all financial data for US listed firms, cross-check them with data from Datastream, and construct variables including earnings, cash flows and capital expenditure
<u>National Bureau Statistics (NBS) Statistical Yearbook</u>	
Net Income	The aggregated net income of all industrial firms (both listed and non-listed) in China
<u>National Bureau Statistics (NBS) China Industrial Enterprise Database</u>	
	ROA, ROE and other financial variables for <i>unlisted</i> firms in China for 1998-2013. The variable definitions are the same as those for listed firms.
<u>World Bank</u>	
GDP Growth	The real GDP growth rate adjusted for inflation in local currency
GDP Per Capita	The ratio of total GDP to total population in million US dollar
Consumption	The standard deviation of aggregate annual consumption in one country in trillion US dollar
Volatility	Domestic credit provided by the financial sector includes all credits to various sectors on a gross basis, with the exception of credit to the central government, which is net. The financial sector includes monetary authorities and deposit money banks, as well as other financial corporations where data are available.
Credit from Financial Institutions/GDP	The ratio of the sum of money and quasi money (M2) to GDP. M2 comprises the sum of currency outside banks, demand deposits other than those of the central government, and the time, savings, and foreign currency deposits of resident sectors other than the central government
M2/GDP	
<u>Bloomberg</u>	
Return Volatility	The standard deviation of monthly stock returns multiplied by the square root of 12.
<u>World Federation of Exchanges</u>	
Stock Turnover Ratio	The ratio between the Electronic Order Book (EOB) turnover of domestic shares and their market capitalization. The value is annualized by multiplying the monthly average by 12
<u>Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008)</u>	
Anti-self-dealing index	Average of ex-ante and ex-post private control of self-dealing, ranging from zero to one
Time to collect on a bounced check	Logarithm of the length (in calendar days) of the judicial procedure to collect on a bounced check. Source: Djankov et al. (2003a)
Tax evasion	Assessment of the prevalence of tax evasion. Higher scores indicate higher tax evasion. The data is for 2002. Ranges from 0.94 to 8.54. Source: World Economic Forum (2003)

Figure 1. Normalized Real GDP in Large Countries by Year

This figure plots the normalized real GDP of China and other larger countries: United States, India, Brazil, and Japan. The GDP data are in local currency and extracted from the World Bank database. The GDP values have been adjusted for local inflation. The number is normalized to 1 in the starting year. Panel A and B plot the normalized GDP of China and other larger countries for 1991-2014 and 2000-2014, respectively.

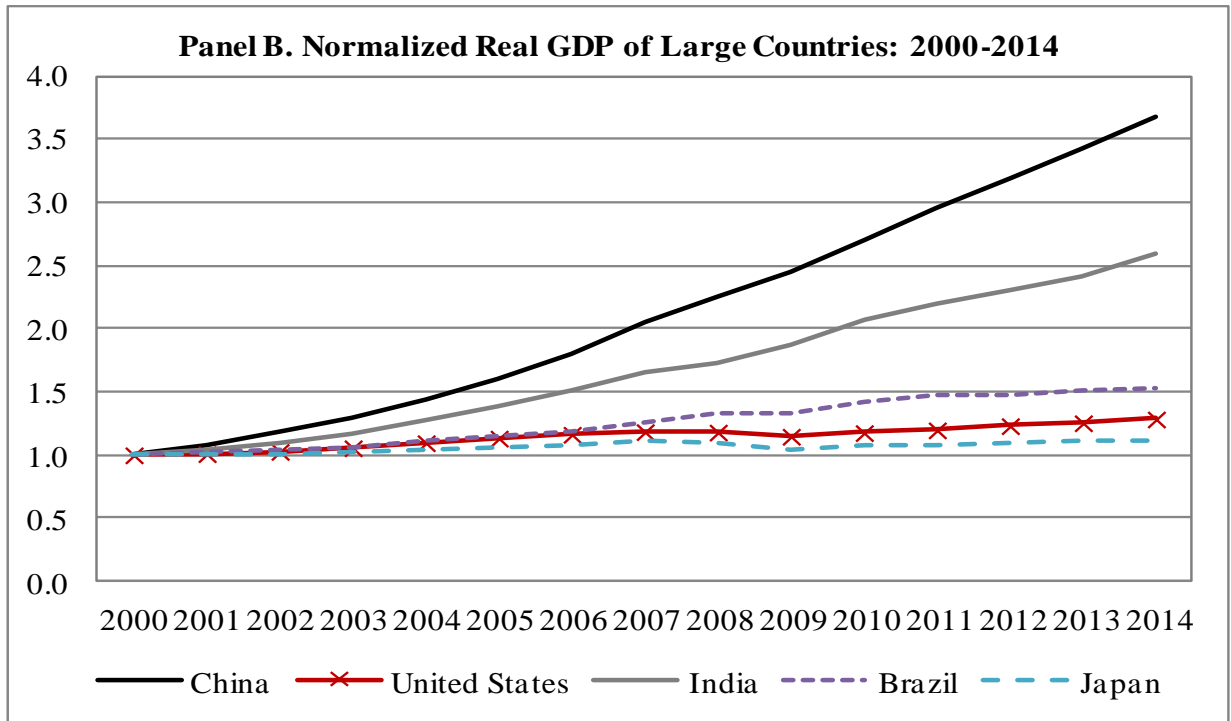
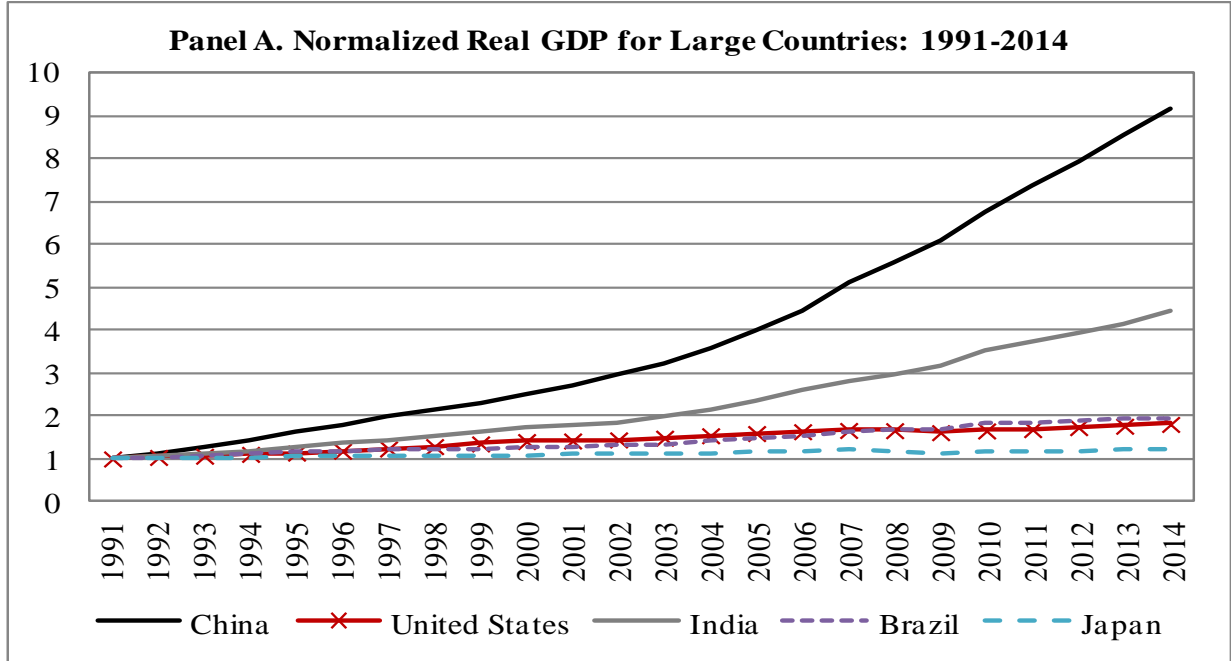


Figure 2. Cumulative Annual Returns of Stock Indices in Large Countries

The figure plots the cumulative returns of the stock indices in large countries from 1992 to 2014. The indices are: SSE Composite Index (China), S&P 500 (US), BSE Sensex (India), IBOV (Brazil) and Nikkei 225 (Japan). Annual index return data are collected from Bloomberg. The nominal returns are in local currency and adjusted for local inflation, measured by the year-end CPI. SSE and S&P 500 are value-weighted indices with total market capitalization as the weight; SENSEX and IBOV are value-weighted indices with tradable shares' market capitalization as the weight. Nikkei is an equal-weighted index. SSE composite include all stocks listed in Shanghai Stock Exchange. S&P 500, SENSEX, IBOV, and Nikkei include 500, 30, 50 and 225 stocks, respectively.

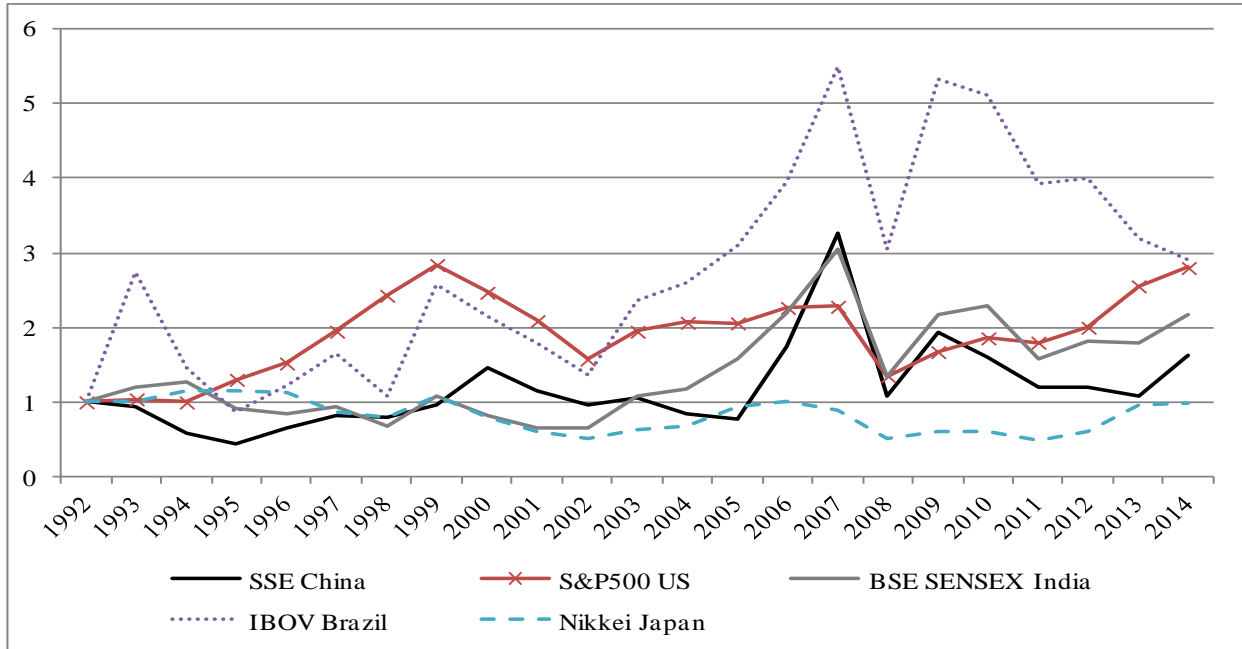


Figure 3. Consumer Price Index (CPI) of China for 1992-2014

This figure plots the monthly CPI of China from January 1992 to March 2014. Monthly CPI data is collected from National Bureau of Statistics (NBS) of China.

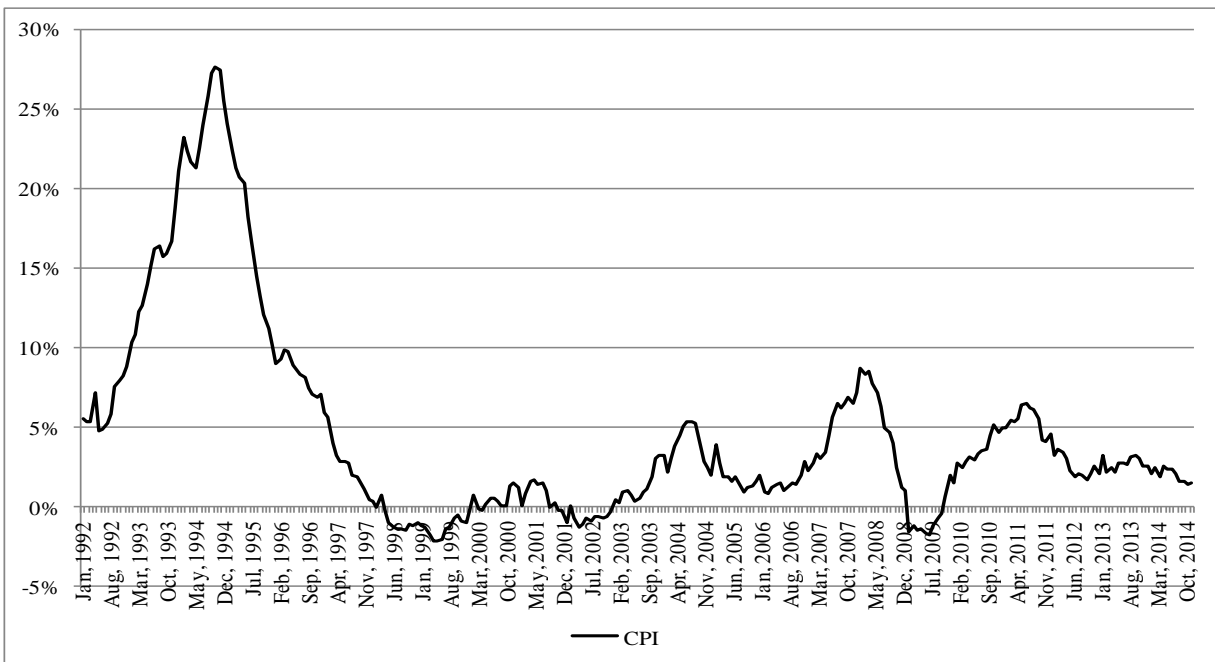


Figure 4. Value-Weighted Buy-and-Hold Returns of Stocks Listed in Large Countries

This figure plots the value-weighted buy-and-hold returns (BHR) of the stocks listed in China (A-Share), US, India, Brazil and Japan. The BHRs are calculated by accumulating value-weighted annual returns of all stocks listed in the country with the lagged-one-year market capitalization as the weight. The returns are adjusted for stock split and include cash dividends. Nominal returns are adjusted for inflation to be converted to real returns. Inflation is measured by the year-end CPI rate of the listing country. We set the BHR to be 1 in year 2000. We appreciate the CAFR-Chinese stock market research project for sharing with us the stock return data of A-share listed firms. Stock returns of US listed firms are from CRSP. Stock return data for firms listed in other large countries are extracted from Datastream. Annual stock returns are denominated in local currency. The number of unique firms to make the plot for China, US, Brazil, India, Japan and Chinese firms listed overseas is 2872, 9369, 867, 3436, 6510 and 758, respectively.

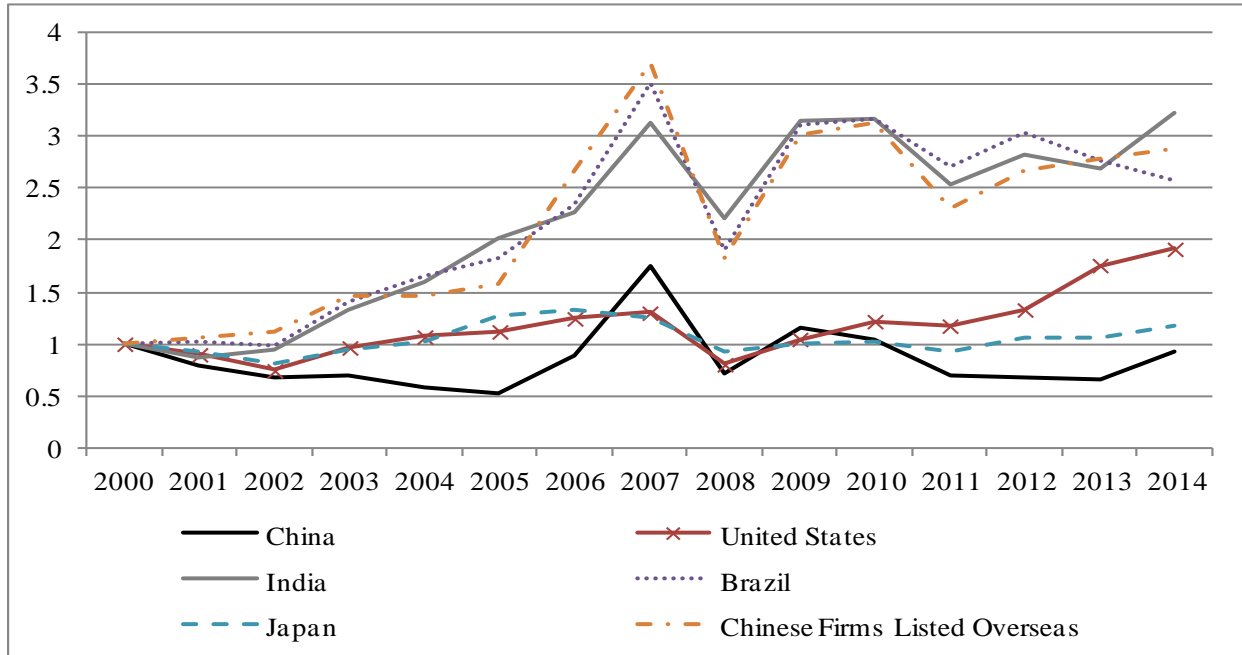


Figure 5. Comparison of Returns on Bank Deposits, Government Bond and Stocks Listed in A-Share

This figure plots the buy-and-hold returns on bank deposits, government bonds and stocks listed in China (A-Share). The line represents the value-weighted buy-and-hold returns of stocks listed in Shanghai or Shenzhen stock exchange, with the lagged-one-year market capitalization as the weight. The stock returns have been adjusted for stock split and include cash dividends. The bars represent cumulative returns on 1-year and 5-year bank deposits, and 3-year and 5-year government bonds in China. Nominal returns on bank deposits, government bonds and stocks are adjusted for inflation (measured by the year-end inflation rate) to be converted to real returns. The deposit interest rate and government bond yield data are extracted from the website of Peoples' Bank of China (PBOC). If the government bond is issued for multiple times in one year, we calculate the average yield of these issues and then cumulate the mean return.

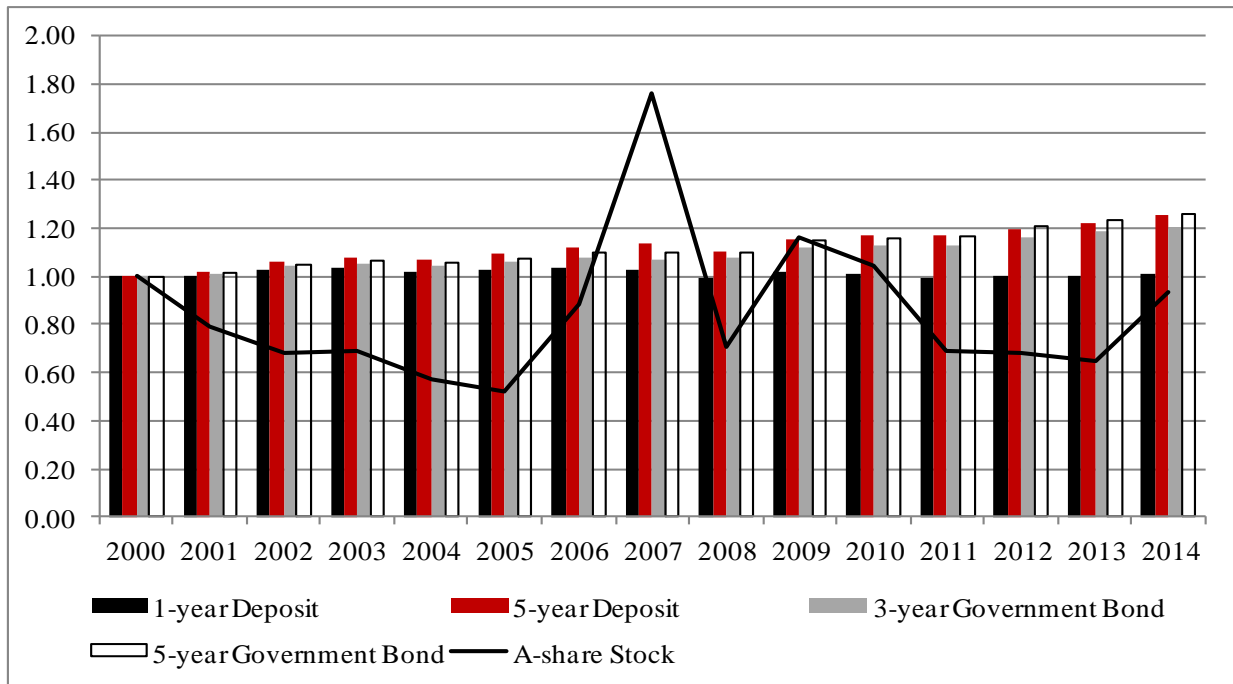


Figure 6. Operating Performance of Listed Firms and Matched Unlisted Firms in China

This figure plots the value-weighted average ROA of listed firms and their one-to-one matched unlisted (private) firms in China (A-Share), with year-end book assets as the weight. For each listed firm, we select from the sample of unlisted firms the one with the closest book assets measured in the same year as the matching firm. Industry is defined by the level-2 industry classification in Datastream. We require the book assets of the matching firm to be within the [80%, 120%] range of the book assets of the listed firm. We exclude newly listed firms in each year. For the period 1998-2013, 2767 distinct listed firms are matched with one unlisted firm each.

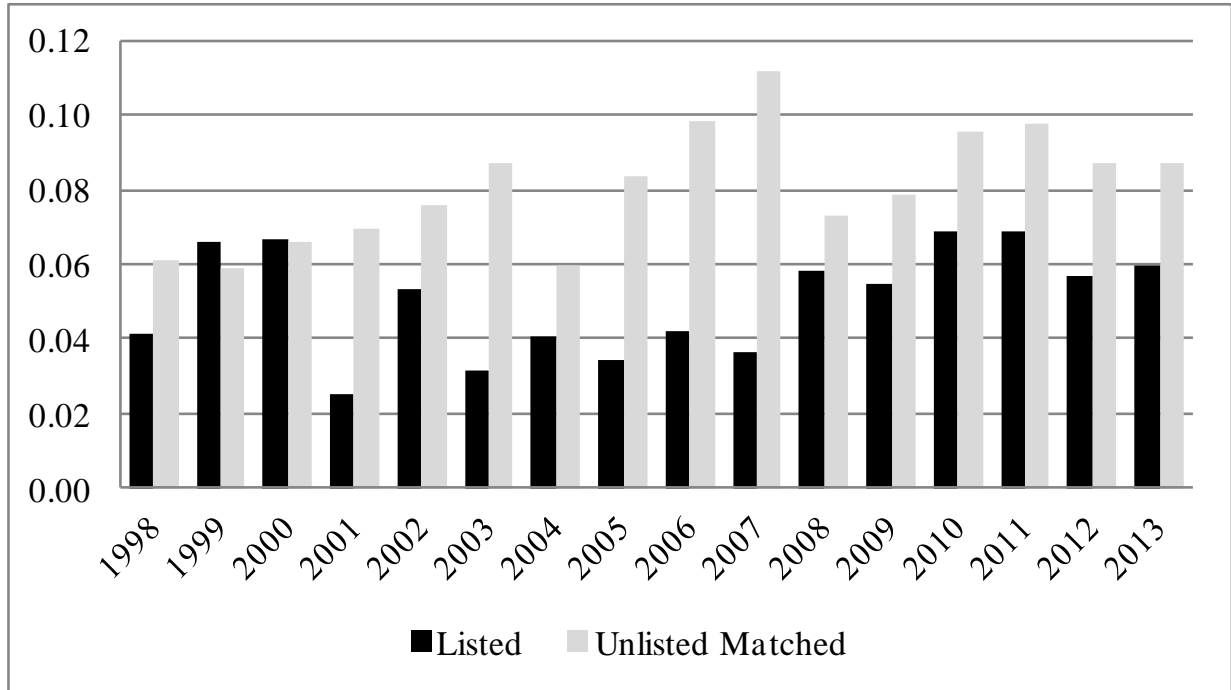


Figure 7. Comparison of Operating Performance of Listed Firms before Special Treatment (“ST”) in China and Listed Firms before Delisting US

This figure plots the operating performance of firms listed in China (A-Share) in the [-5,0] year window before receiving a “special treatment” (“ST”) and that of US listed firms before being delisted. Operating performance is measured by ROA averaged across firms in the same window. Window 0 denotes the year when a firm becomes special treated or delisted. “ST” firms in China include temporary ST and permanent ST. The former refers to firms that ever received special treatment but later got their ST removed; the latter refers to firms that received special treatment and never re-emerged from the special treatment later during the sample period. In total, there are 527 distinct “ST” firms in our sample, 82 of which are permanent “ST” firms. To make a sensible comparison, we allow only permanent “ST” firms to enter the plot. For Chinese “ST” firms, window 0 refers to the year when the firm becomes “ST”. For US delisted firm, window 0 refers to the delisting year, i.e., the year of last stock price available or the year when the firm’s stock trading becomes inactive, depending on which date appeared later. We extract delisting information for US listed firms from CRSP. CRSP document 6 major reasons for delisting: merger, exchange, liquidation, being dropped, expire, and become foreign listed. We keep firms that are delisted for the reason “liquidation” or “being dropped”. This leaves us 295 distinct firms that are delisted from US stock exchanges.

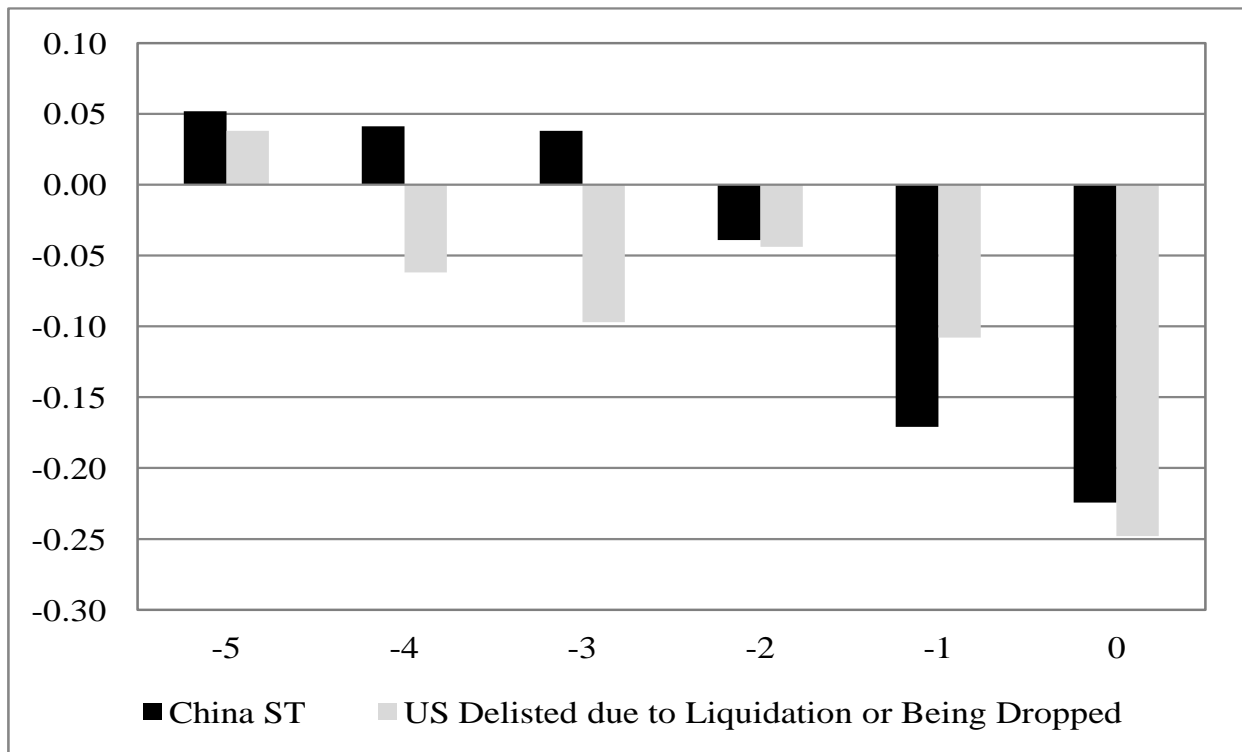
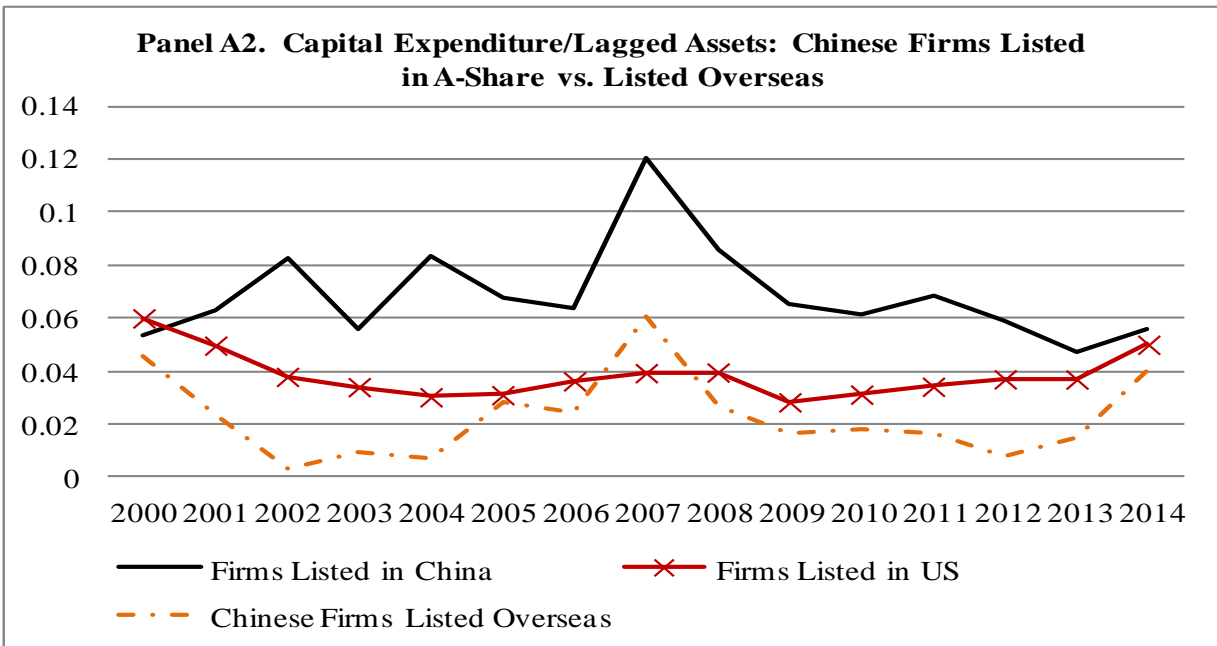
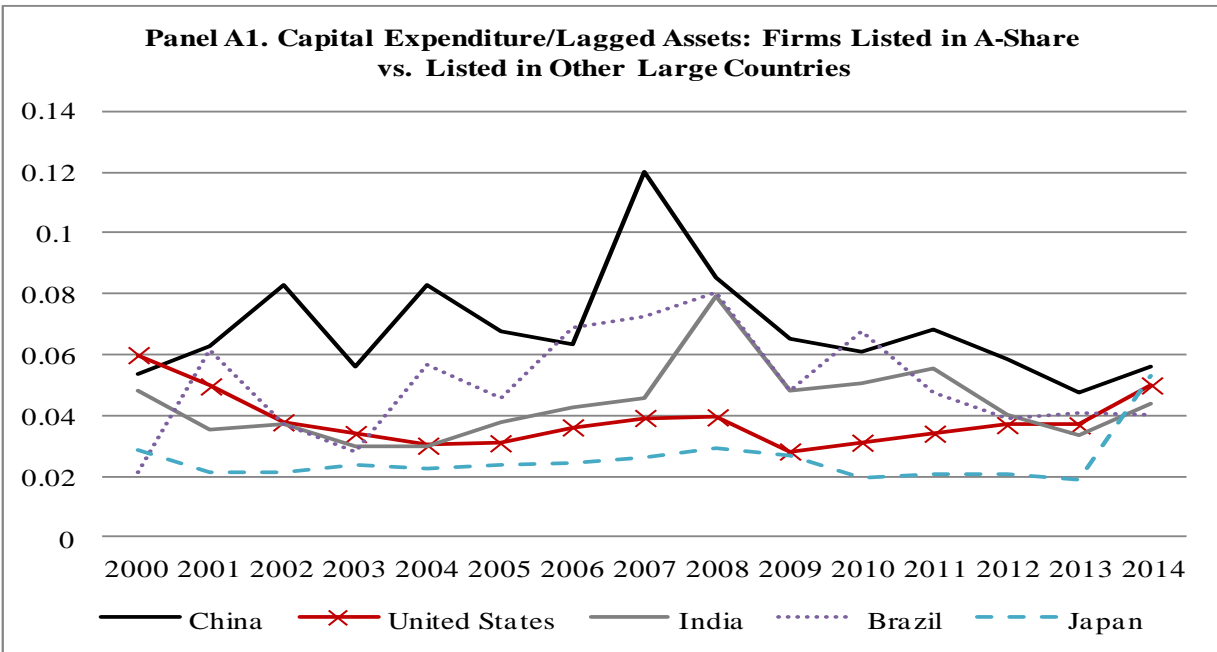
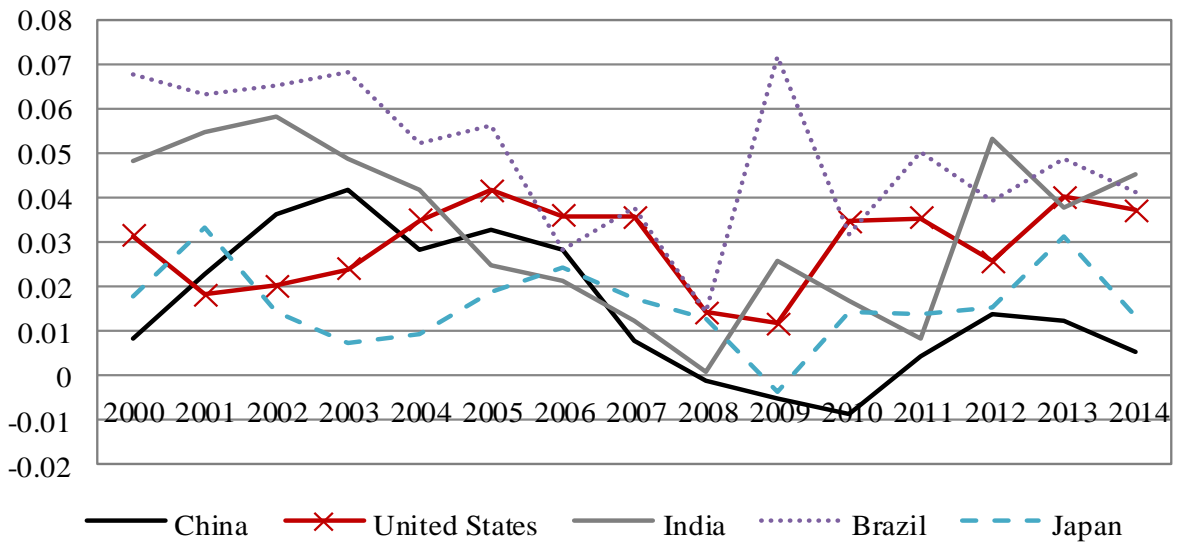


Figure 8. Investment and Net Cash Flows of Listed Firms in China and Other Large Countries

This figure plots the value-weighted average investment and net cash flows of listed firms in China (A-Share) and other large countries by year. Panel A1 and A2 plot the average investment of listed firms. Investment is measured by capital expenditure in year t scaled by the book assets in year $t-1$. Panel B1 and B2 plot the average net cash flows of listed firms. Net cash flows are scaled by book assets. Net Cash Flow is calculated as EBITDA – Change in Working Capital – Income Taxes – Capital Expenditure. Both the investment and cash flow measures are averaged across firms with the year-end book assets as the weight. The sample is restricted to firms that have non-missing data on EBITDA, capital expenditure, working capital, income taxes and book assets. In Panel A1 and B1, the number of unique firms that enter the plot for China, US, India, Brazil and Japan is 2573, 7453, 3368, 799 and 6430, respectively. In Panels A2 and B2, the number of unique Chinese firms listed overseas that enter the plot is 702.



Panel B1. Net Cash Flow/Total Assets: Firms Listed in A-Share vs. Listed in Other Large Countries



Panel B2. Net Cash Flow/Total Assets: Chinese Firms Listed in A-Share vs. Listed Overseas

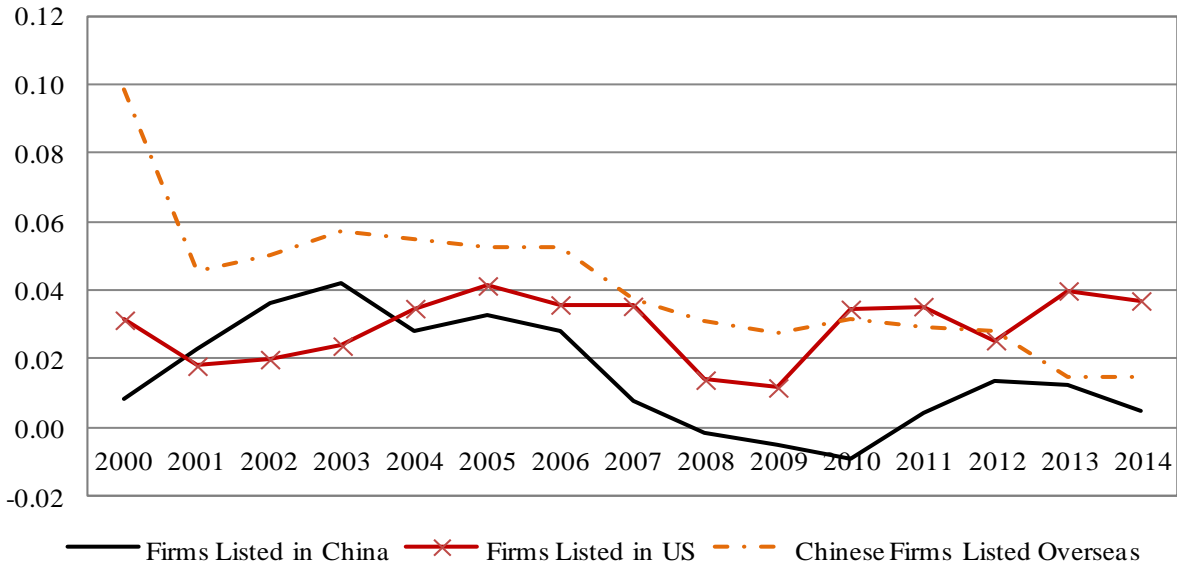


Figure 9. Investment and Net Cash Flows around IPO for Chinese vs. US Listed Firms

This figure plots the average investment and net cash flow of Chinese firms listed in mainland China (A-Share) and Chinese firms listed overseas, and firms listed in the US around IPO. We require firms have non-missing capital expenditure, net cash flows and total assets in the year prior to IPO. Investment is measured as capital expenditure scaled by the lagged-one-year total assets. Net Cash Flow is calculated as EBITDA – Change in Working Capital - Income Taxes – Capital Expenditure. Both the measures for investment and cash flows are averaged across firms with year-end total assets as the weight. The number of firms listed in China, US and Chinese firms listed overseas that enter the plot is 1599, 2749 and 483, respectively.

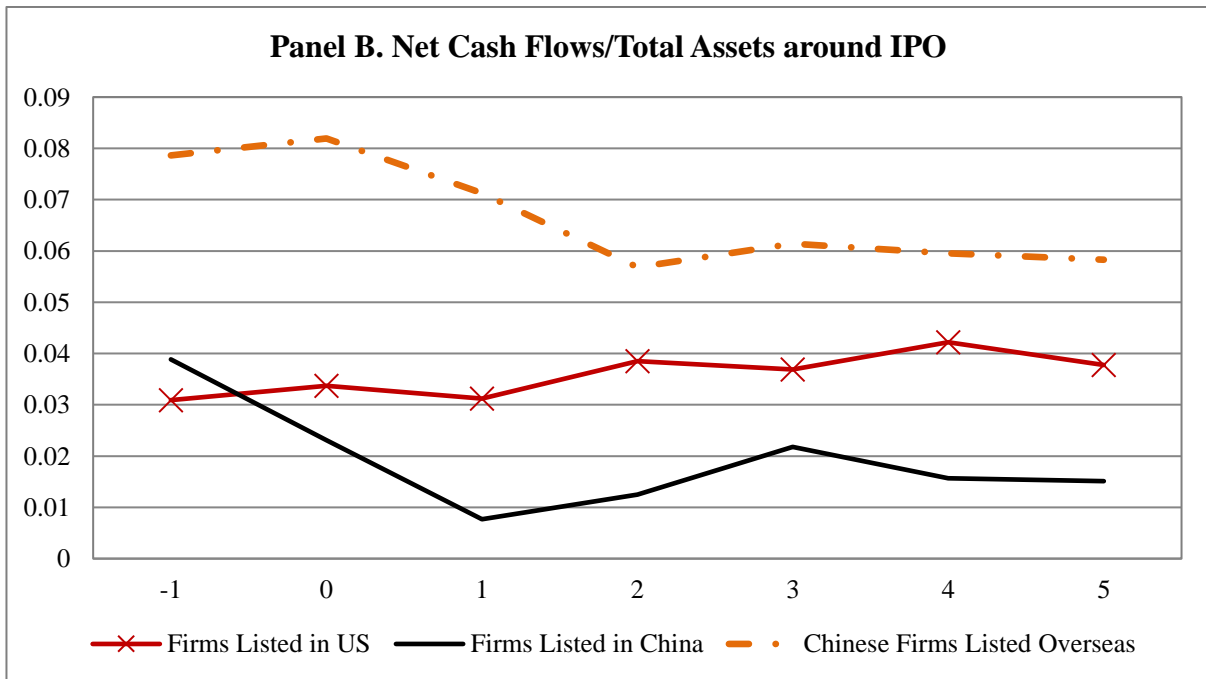
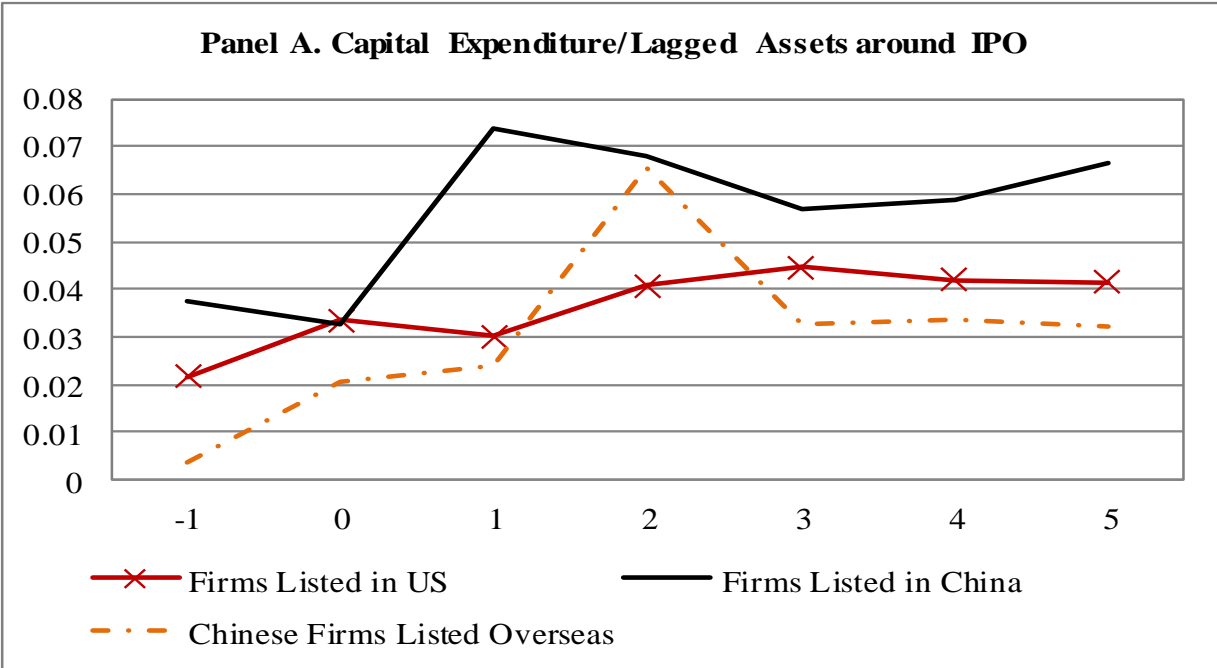


Figure 10. Valuation of Firms Listed in China and Other Large Countries

This figure plots the aggregate market-to-book ratio of the firms listed in mainland China (A-Share) and firms listed in other large countries. For each country, the aggregate market-to-book is calculated as the sum of market capitalization of all stocks listed in this country divided by the sum of book equity of the same firms. To ensure consistency of calculation of the numerator and denominator, we use stock-level book equity as the denominator for firms that are listed in more than one market. Stock-level book equity as calculated as firm-level book equity multiplied by the ratio of market capitalization of the stock listed in one country out of the total market capitalization of the firm in all countries that the firm is listed in. In Panel A, the number of unique firms for China, US, India, Brazil and Japan is 2662, 8467, 3333, 726 and 6432, respectively. In Panel B, the number of unique Chinese firms listed overseas that enter the plot is 758.

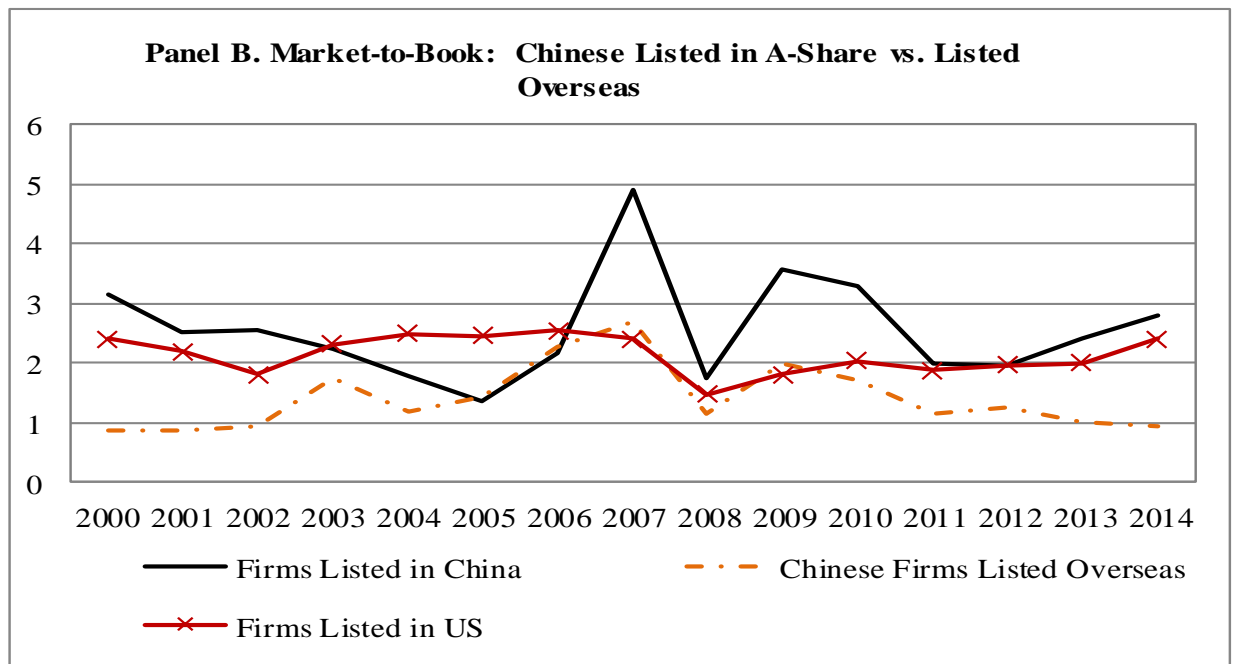
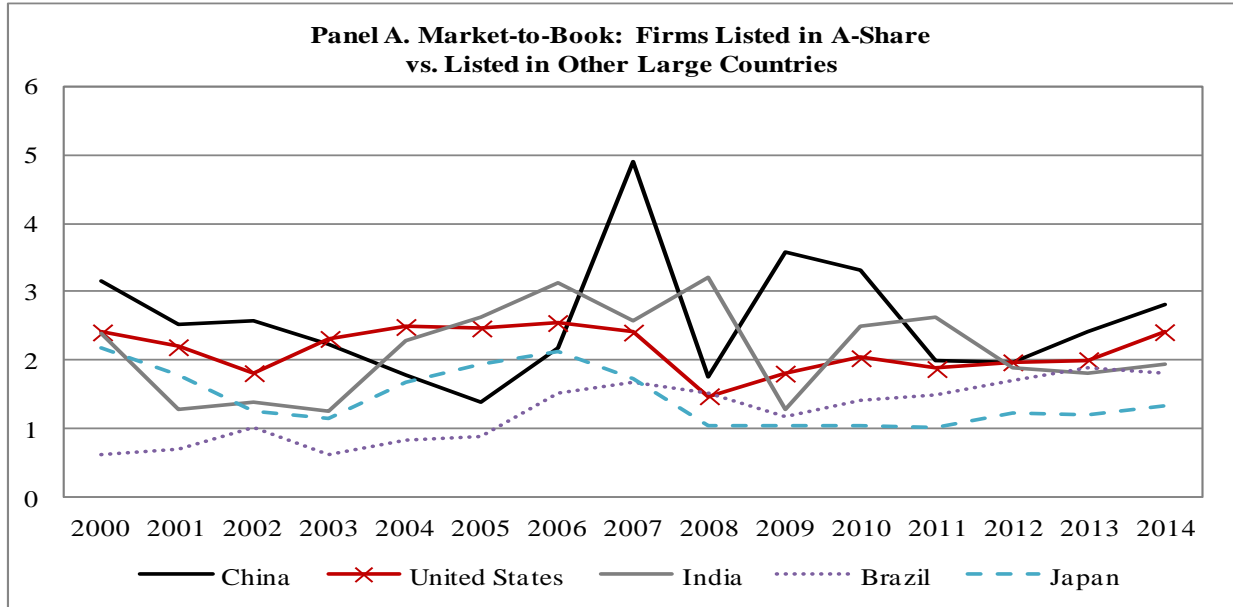


Table 1
Distribution of Firms Listed in China and Other Countries by Year

This table presents the summary statistics of firms listed in China and firms listed in other countries by year. Panel A shows the distribution of Chinese listed firms in our sample by year. Columns 1 to 3 present the distribution for Chinese firms listed in Shanghai or Shenzhen stock exchanges (“A-Share”). Columns 4 to 6 present the distribution of firms headquartered in China and listed in overseas markets. Columns 2 and 5 report the number of state-owned firms (SOE) listed in A-share and Chinese SOEs listed overseas. The state ownership information is extracted from WIND under the data item “ultimate controller”. We define firms ultimately controlled by central SASAC (State-owned Assets Supervision and Administration Commission of the State Council), local SASAC, Ministry of Finance, and other government agency as state-owned firms. Columns 3 and 6 report the average book assets (\$ billion) of Chinese firms listed in A-Share and the average book assets of Chinese firms listed overseas, respectively. Panel B presents the number of firms listed in other large countries by year, including US, India, Brazil and Japan.

Panel A. # of Chinese Stocks Listed in A-Share and in Overseas Markets						
Year	Firms Listed in A-Share			Chinese Firms Listed Overseas		
	# Listed Firms	# of Listed SOEs	Average Assets (\$ Billion)	# Listed Firms	# of Listed SOEs	Average Assets (\$ Billion)
	(1)	(2)	(3)	(4)	(5)	(6)
2000	1041	779	0.25	51	46	1.32
2001	1123	844	0.31	65	47	2.68
2002	1192	900	0.37	80	47	2.42
2003	1255	796	0.43	97	53	2.63
2004	1343	820	0.46	128	62	3.02
2005	1340	813	0.51	167	70	3.32
2006	1418	823	0.69	203	80	8.48
2007	1522	841	0.98	268	102	17.03
2008	1577	858	1.07	337	111	17.47
2009	1723	873	1.20	384	123	19.04
2010	2071	910	1.25	431	131	21.28
2011	2300	902	1.31	490	133	27.40
2012	2464	943	1.35	534	141	31.40
2013	2465	1157	1.47	549	140	30.79
2014	2321	919	1.76	661	172	34.43

Panel B. # of Stocks Listed in Other Large Countries				
Year	United States	India	Brazil	Japan
2000	6614	606	417	2909
2001	6369	688	379	3065
2002	6179	724	370	3103
2003	6109	877	390	3183
2004	5958	1109	432	3239
2005	5847	1303	431	3284
2006	5613	2517	432	3263
2007	5358	2644	436	3234
2008	5268	2725	424	3175
2009	5232	2758	413	3117
2010	5183	2730	408	3040
2011	5077	2715	386	2970
2012	4852	2652	351	2896
2013	4665	2999	535	2711
2014	4717	2876	506	2696
Total	9369	3436	867	6510

Table 2
Correlation between 5-Year Stock Returns and Future GDP Growth

This table reports the Pearson correlation between 5-year stock returns and the future GDP growth in that country for the top 20 countries according to the IMF GDP ranking in 2014. We include South Africa in addition to the top 20 countries. We calculate the correlation for 1991-2014, or for a period starting from the year when the stock return data become available in our dataset and ending at 2014, if the first stock return data are available after 1991. The correlation is estimated using cumulative stock returns of a 5-year interval and the cumulative GDP growth in the next 5-year interval (so we get stock returns for year t, t+5, ...and GDP growth for year t+1, t+6, ...), back from 2014 on a rolling basis. Country-level stock returns are calculated as value-weighted stock returns of individual stocks listed in a country, with the lagged one year market capitalization as the weight. The last row tests the difference in the correlation coefficients of China and developed countries as a group, and the difference of China and other emerging countries as a group. We use the OECD Classification to define developed and emerging countries. Emerging countries include China, Brazil, Russian Federation, India, Mexico, Indonesia, Turkey and Saudi Arabia. We do not have individual stock return data for South Korea so we calculate the correlation using the stock market index (KOSPI Korea). For Saudi Arabia, the stock market index data are available for a longer period than individual stock return data in our sample, so we report the correlation calculated from the stock market index (the DFMGI Index). ***, ** and * denote the statistical significance at 1%, 5% and 10% levels.

IMF GDP Ranking	Country	Individual Stock or Index Returns	Sample Period	Correlation	p-value
1	United States	Stock Return	1991-2014	0.565***	0.004
2	China	Stock Return	1991-2014	0.012	0.958
3	Japan	Stock Return	1991-2014	0.418**	0.046
4	Germany	Stock Return	1991-2014	0.697***	<0.001
5	United Kingdom	Stock Return	1991-2014	0.322	0.133
6	France	Stock Return	1991-2014	0.602***	0.003
7	Brazil	Stock Return	1995-2014	0.560**	0.012
8	Italy	Stock Return	1991-2014	0.286	0.195
9	India	Stock Return	1991-2014	0.573***	0.006
10	Russian Federation	Stock Return	1996-2014	0.547**	0.032
11	Canada	Stock Return	1991-2014	0.524**	0.014
12	Australia	Stock Return	1991-2014	0.469**	0.023
13	South Korea	Index Return	1991-2014	-0.156	0.793
14	Spain	Stock Return	1991-2014	0.593***	0.002
15	Mexico	Stock Return	1991-2014	0.322	0.143
16	Indonesia	Stock Return	1991-2014	0.349	0.121
17	Netherlands	Stock Return	1991-2014	0.735***	<0.001
18	Turkey	Stock Return	1991-2014	0.414*	0.054
19	Saudi Arabia	Index Return	1995-2014	0.196	0.524
20	Switzerland	Stock Return	1991-2014	0.288	0.182
1	South Africa	Stock Return	1991-2014	0.619***	0.002
	Chinese Stocks Listed Overseas	Stock Return	1991-2014	0.414*	0.069
				Difference (Other Countries-China)	p-Value
Difference	Group	Mean of Correlation	China		
	Developed	0.568	0.012	0.556***	<0.001
	Emerging	0.567	0.012	0.555***	<0.001

Table 3**Level and Growth of Net Income of Chinese Firms by Sector**

This table reports the level and growth of net income generated by industrial sector in China. We group all industrial firms into state-owned enterprises (SOEs) and non-state-owned enterprises (non-SOEs). Within the SOE group and the non-SOE group, we further distinguish firms to *Listed SOE*, *Unlisted SOE*, *Listed Non-SOE* and *Unlisted Non-SOE*. Panel A reports the proportions of the *aggregate* net income of each group out of the aggregated net income of all industrial firms, listed or unlisted industrial firms in China. Panel B reports the *aggregate* net income growth rate of each group. We calculate aggregate net income growth for each group as the increase in net income aggregated across firms of this group from year t-1 to year t, scaled by the total net income generated by the same group of firms in year t-1. The bottom row of Panel B reports the Pearson correlations between the net income growth rate of each group of firms and the contemporaneous GDP growth rate in China. We extract net income data for all industrial firms and those for SOEs from the statistical yearbook of National Bureau of Statistics (NBS). ***, ** and * denote statistical significance at 1%, 5% and 10% level, respectively.

Panel A. Net Income Percentage of Chinese Firms Listed in A-Share				
Year	SOE/All	Listed/All	Listed SOE/Listed All	Unlisted Non-SOE/Unlisted All
	(1)	(2)	(3)	(4)
2000	53.74%	35.10%	89.94%	65.84%
2001	49.03%	24.96%	94.50%	66.09%
2002	44.10%	24.23%	90.71%	70.81%
2003	43.66%	25.42%	88.31%	71.55%
2004	41.41%	25.85%	89.85%	75.47%
2005	39.58%	23.72%	92.46%	76.87%
2006	39.92%	22.15%	90.26%	74.40%
2007	36.63%	21.20%	86.68%	76.84%
2008	27.98%	17.45%	85.02%	84.07%
2009	26.02%	15.73%	80.97%	84.24%
2010	27.34%	15.14%	79.88%	82.04%
2011	25.65%	14.42%	77.43%	83.08%
2012	23.48%	13.70%	78.17%	85.20%
2013	21.25%	17.62%	79.20%	91.14%
2014	20.01%	19.32%	75.55%	82.31%

Panel B. Net Income Growth of Chinese Firms by Sector						
Year	All	Listed	Unlisted	Listed SOE	Listed Non-SOE	Unlisted Non-SOE
	(1)	(2)	(3)	(4)	(5)	(6)
2001	0.060	-0.246	0.225	-0.208	-0.588	0.23
2002	0.217	0.182	0.229	0.134	0.998	0.317
2003	0.474	0.546	0.451	0.505	0.944	0.466
2004	0.424	0.448	0.415	0.473	0.257	0.493
2005	0.243	0.141	0.279	0.174	-0.152	0.302
2006	0.336	0.247	0.363	0.217	0.611	0.319
2007	0.408	0.349	0.426	0.295	0.843	0.472
2008	0.128	-0.071	0.182	-0.089	0.044	0.294
2009	0.145	0.031	0.168	-0.018	0.311	0.171
2010	0.552	0.494	0.563	0.474	0.579	0.522
2011	0.15	0.095	0.159	0.061	0.229	0.174
2012	0.005	-0.045	0.014	-0.036	-0.077	0.04
2013	0.104	0.42	0.054	0.439	0.353	0.128
2014	0.019	0.064	-0.063	-0.01	0.22	0.034
Average	0.233	0.188	0.247	0.172	0.327	0.283
Correlation Coefficient	0.687***	0.390	0.713***	0.361	0.411	0.627**
P-Value	0.007	0.168	0.004	0.204	0.144	0.022

Table 4
Cross-Country Comparison of Stock Returns

This table examines the stock performance of listed firms in China relative to listed firms in other countries. The dependent variable is annual stock returns adjusted for stock split and inflation. Columns 1 to 4 report regression results of stock returns for the period 1991-2014. Columns 5 and 8 report regression results of stock returns for the period 2000-2014. In columns 1, 2, 5 and 6, the independent variable of interest is *Listed in A-Share*, a dummy taking one if the stock is listed in Shanghai or Shenzhen stock exchange, and zero otherwise. In columns 3, 4, 7 and 8, the independent variable is *Chinese Firms Listed Overseas*, a dummy taking one if the listing firm is headquartered in mainland China and the stock is listed in overseas markets, including Hong Kong, US, UK, Australia, Canada, Singapore and Taiwan. In all specifications, we include firm characteristics and country characteristics as controls. The coefficients of *Consumption Volatility* and *EBIT of Listed Firms/GDP* are multiplied by 1000. *GDP growth*, *GDP per capita*, *Credit from Financial Institutions/GDP*, *M2/GDP*, *Population* and *Consumption* information are at country-year level and extracted from World Bank database. *Stock Turnover Ratio* is extracted from World Federation of Exchanges. *EBIT of Listed Firms* refers to the aggregate EBIT generated by all listed firms in a given country in a given year. All Control variables are lagged one year when entering the regressions. *Anti-Self-Dealing Index*, *Tax Evasion and Time to Collect on a Bounced Check* are country-level variables constructed by Djankov et al. (2008). *Log (Total Assets)*, *ROA*, *ROE*, *EBIT Growth*, *Leverage* and *Sales Growth* are firm-level variables measured at year-end. *Return Volatility* is the annualized standard deviations of monthly stock returns. We exclude firms listed in exchanges that have fewer than 20 stocks in any given year from the sample. In all specifications we control for year and the level-2 industry fixed effects based on the Datastream industry classification. T-values calculated using the standard errors clustered by listing country are reported in the parentheses. ***, ** and * denote the statistical significance at 1%, 5% and 10% level. See detailed variable definitions in the Appendix.

Variable	1991-2014				2000-2014			
	Model1	Model2	Model3	Model4	Model5	Model6	Model7	Model8
Listed in A-Share	-0.071** (-2.046)	-0.078 (-1.298)			-0.100** (-2.193)	-0.111* (-1.644)		
Chinese Firms Listed Overseas			-0.002 (-0.161)	0.004 (0.182)			-0.002 (-0.125)	0.009 (0.376)
GDP Growth	1.401*** (2.645)	1.640** (2.179)	0.882*** (3.032)	1.336*** (2.930)	1.904*** (2.884)	2.280** (2.419)	1.131*** (3.121)	1.766*** (3.352)
GDP Per Capita (\$ Million)	0.008 (0.016)	0.752 (1.258)	-0.192 (-0.391)	0.993 (1.556)	0.375 (0.621)	1.146 (1.515)	0.162 (0.270)	1.444* (1.845)
Stock Turnover Ratio	0.009 (0.737)	0.015 (0.793)	0.012 (0.943)	0.005 (0.534)	0.009 (0.716)	0.016 (0.817)	0.009 (0.730)	0.002 (0.256)
Credit from Financial Institutions/GDP	0.029*** (2.731)	0.033** (2.219)	0.020* (1.881)	0.027* (1.949)	0.038*** (3.576)	0.043*** (2.798)	0.028** (2.406)	0.034** (2.262)
EBIT of Listed Firms/GDP	0.618 (0.681)	0.958 (1.180)	0.321 (0.963)	0.912 (0.969)	0.536 (0.685)	0.937 (1.089)	0 (1.324)	0.93 (0.828)
M2/GDP	-0.011 (-1.099)	-0.009 (-0.695)	-0.012 (-1.279)	-0.015 (-1.133)	-0.009 (-0.892)	-0.009 (-0.670)	-0.01 (-1.018)	-0.018 (-1.069)
Consumption Volatility	0.051 (-0.649)	0.046 (-0.196)	0.011 (-0.558)	0.045 (0.300)	0.053 (-0.832)	0.062 (-0.195)	0.012 (-0.634)	0.047 (0.433)
Anti-Self-Dealing Index	0.002 (0.084)	0.011 (0.294)	0.01 (0.384)	0.007 (0.180)	-0.006 (-0.192)	-0.003 (-0.064)	0.011 (0.412)	-0.005 (-0.115)
Tax Evasion	0.002 (0.410)	0.002 (0.444)	0.003 (0.715)	0.004 (0.624)	-0.001 (-0.112)	0.002 (0.218)	0.001 (0.043)	0.003 (0.373)
Time to Collect on a Bounced Check	-0.001 (-0.120)	0.01 (0.740)	-0.005 (-0.678)	0.002 (0.210)	0.001 (0.085)	0.012 (0.813)	-0.005 (-0.730)	-0.001 (-0.094)
Log (Total Assets)		-0.002*** (-2.818)		-0.002*** (-3.979)		-0.002** (-2.396)		-0.003*** (-3.462)
Leverage		-0.050*** (-4.702)		-0.044*** (-4.198)		-0.038*** (-3.382)		-0.029*** (-3.025)
EBIT Growth		0.006*** (5.357)		0.007*** (5.274)		0.006*** (4.768)		0.006*** (4.616)
Sales Growth		-0.002* (-1.712)		-0.002* (-1.696)		-0.001 (-1.345)		-0.001 (-1.306)
ROA		0.232*** (4.068)		0.235*** (4.115)		0.225*** (3.969)		0.228*** (4.003)
ROE		0.056*** (5.047)		0.056*** (4.982)		0.055*** (4.545)		0.055*** (4.469)
Stock Return Volatility		0.117 (0.914)		0.118 (0.913)		0.076 (0.852)		0.078 (0.850)
Intercept	0.038 (0.618)	0.03 (0.357)	0.053 (1.061)	0.091** (1.985)	-0.101 (-1.167)	-0.216* (-1.684)	-0.025 (-0.471)	-0.135** (-2.204)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared (%)	9.39	14.85	9.15	14.74	10.27	16.21	10.15	15.98
Observations	919711	543425	919711	543425	810453	482867	810453	482867

Table 5
Operating Performance around IPO: China vs. Other Countries

This table presents the multivariate regression results for changes in ROA, ROE and ROS around IPO for listed firms. Panel A reports the regression results of the sample of firms listed in Shanghai or Shenzhen stock exchanges in mainland China (A-share) and firms listed in stock exchanges in other countries. We calculated the absolute changes in ROA, ROE and ROS from year t-1 to year t+1, and from year t-2 to year t+2. Year t represents the IPO year. The regressions are conducted on a panel of firm-year from five large countries over the period 2000 to 2014: China, United States, India, Brazil and Japan. Panel B reports the regressions results of the sample of all Chinese firms listed in A-share and Chinese firms listed in overseas exchanges. The independent variable of interest is the *Listed in A-Share* dummy, which takes one if the firm is listed in Shanghai or Shenzhen stock exchanges in China. Other explanatory variables are constructed by firm-year and extracted at the end of year t-1 or t-2. We control for the change in cash holdings from year t-1 to the IPO year as the proxy for IPO proceeds, scaled by the book assets. We control for GDP growth and GDP per capita in the current year (t+1 or t+2). We also control for year and industry fixed effects based on the level-2 industry classification in Datastream in all specifications. T-values calculated using the standard errors clustered by year and listing country are reported in the parentheses. ***, ** and * denote the statistical significance at 1%, 5% and 10% level. See detailed variable definitions in the Appendix.

Panel A. Operating Performance around IPO: China vs. Other Large Countries						
Variable	ROA		ROE		ROS	
	$\Delta [-1,+1]$	$\Delta [-2,+2]$	$\Delta [-1,+1]$	$\Delta [-2,+2]$	$\Delta [-1,+1]$	$\Delta [-2,+2]$
	(1)	(2)	(3)	(4)	(5)	(6)
China	-0.039*** (-4.532)	-0.023* (-1.838)	-0.026 (-1.380)	-0.029 (-1.083)	-0.073*** (-3.498)	-0.031 (-0.790)
ROA	-0.382*** (-21.051)	-0.475*** (-13.123)				
ROE			-0.884*** (-38.415)	-1.003*** (-23.508)		
ROS					-0.093*** (-8.426)	-0.124*** (-9.075)
Log (Total Assets)	0.009*** (6.301)	0.011*** (6.952)	0.030*** (7.621)	0.029*** (5.600)	0.020*** (3.245)	0.007 (0.752)
Leverage	0.051*** (3.153)	0.043*** (2.740)	0.042 (0.939)	0.135*** (3.904)	0.025 (0.518)	0.046 (0.819)
Sales Growth	0.001 (-1.592)	0.001 (-0.579)	-0.001** (-2.519)	0.001 (-0.896)	0.001 (0.304)	0.001 (0.477)
EBIT Growth	-0.002** (-2.259)	-0.001 (-1.314)	-0.001 (-0.461)	-0.001 (-0.554)	-0.001 (-0.240)	0.001 (0.615)
Change in Cash Holdings	0.116 (0.221)	0.716*** (2.706)	-0.728 (-1.223)	0.158 (0.286)	-0.431 (-0.751)	1.535* (1.734)
GDP Growth	0.003 (0.020)	-0.051 (-0.310)	0.098 (0.242)	0.428 (0.808)	0.623* (1.777)	0.241 (0.457)
Log (GDP Per Capita)	-0.009*** (-3.428)	-0.010*** (-3.475)	-0.041*** (-5.689)	-0.043*** (-4.370)	-0.007 (-1.037)	-0.008 (-1.035)
Intercept	-0.061* (-1.785)	-0.057 (-1.303)	-0.076 (-0.748)	0.039 (0.311)	-0.383*** (-3.011)	-0.14 (-0.827)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared (%)	35.02	42.46	46.23	54.07	15.71	17.89
Observations	6015	5085	6015	5085	6015	5085

Panel B. Operating Performance around IPO: Chinese Firms Listed in China vs. Overseas						
Variable	ROA		ROE		ROS	
	$\Delta [-1,+1]$	$\Delta [-2,+2]$	$\Delta [-1,+1]$	$\Delta [-2,+2]$	$\Delta [-1,+1]$	$\Delta [-2,+2]$
	(1)	(2)	(3)	(4)	(5)	(6)
Listed in A-Share	-0.043*** (-2.589)	-0.079*** (-3.066)	-0.039* (-1.629)	-0.060* (-1.886)	-0.028* (-1.745)	-0.132*** (-4.024)
ROA	-0.663*** (-9.394)	-0.731*** (-8.302)				
ROE			-0.863*** (-29.309)	-0.924*** (-23.294)		
ROS					-0.158*** (-9.877)	-0.216*** (-8.074)
Log (Total Assets)	0.004*** (6.667)	0.007*** (3.630)	0.007*** (3.670)	0.010*** (2.848)	0.003 (0.547)	0.012** (2.371)
Leverage	0.026 (1.250)	0.010 (0.295)	0.044* (1.681)	0.010 (0.241)	0.079*** (3.719)	0.066 (1.528)
Sales Growth	-0.004*** (-3.620)	-0.005*** (-4.858)	-0.005 (-1.483)	-0.008*** (-3.598)	0.002 (1.158)	-0.003 (-1.030)
EBIT Growth	-0.001 (-0.750)	-0.001 (-0.401)	-0.001 (-0.425)	0.001 (0.925)	-0.006*** (-5.451)	-0.005*** (-2.550)
Change in Cash Holdings	-0.007 (-0.807)	0.006 (1.046)	-0.013 (-0.833)	0.000 (-0.006)	-0.002 (-0.237)	0.011 (1.087)
GDP Growth	-0.002*** (-2.857)	0.000 (-0.389)	0.002* (1.770)	0.003*** (2.608)	-0.002*** (-3.917)	-0.001 (-0.910)
Log (GDP Per Capita)	-0.014 (-0.811)	0.233 (1.035)	0.027 (0.797)	-0.006 (-0.322)	0.086 (1.097)	-0.156 (-1.005)
Intercept	0.064*** (4.660)	0.004 (0.069)	-0.007 (-0.206)	-0.023 (-0.409)	0.099** (2.514)	0.049 (0.586)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared (%)	48.11	62.98	73.67	68.38	15.21	17.58
Observations	1308	1237	1265	1260	1126	1112

Table 6**Earnings Management around IPO: China vs. Other Countries**

This table compares the earnings management measures for year window [-1, +3] around IPO for firms listed in China and firms listed in other countries. Year 0 denotes the IPO year. Panel A compares firms listed in Shanghai or Shenzhen stock exchanges in mainland China (A-share) and firms listed in US. Panel B compares Chinese firms listed in A-share and Chinese firms listed in overseas market. The last rows of each sub-panel present the average of variables for window [0, +3]. We construct the earnings management measure *Total Accruals* as Δ Current Assets – Δ Current Liabilities. Δ Current Assets refers to current assets in year t minus current assets in year t-1. *Operating Cash Flow (OCF)* is calculated as EBITDA – Income Taxes - Total Accruals. Δ AR is the change in Accounts Receivables in year t from year t-1. All the three measures, Total Accruals, OCF, and Δ AR are scaled by net sales (*Sales*) measured at the end of the same year. Data for firms listed in mainland China and US are extracted from WIND and Compustat, respectively. Data for Chinese firms listed overseas are extracted from Datastream. ***, ** and * denote the statistical significance at 1%, 5% and 10% level. See detailed variable definitions in the Appendix.

Panel A. Earnings Management: China vs. US					
Window	China	N	US	N	Difference
Total Accruals/Sales					
-1	-0.001	1831	0.001	4423	0.000
0	0.010	2029	0.014	6161	-0.004***
1	-0.101	2166	0.003	6174	-0.105***
2	-0.066	2317	0.002	6373	-0.068***
3	-0.044	2400	0.003	5982	-0.047***
Average [0,3]	-0.041	6883	0.011	18529	-0.053***
OCF/Sales					
-1	0.212	1831	0.039	4423	0.173***
0	0.127	2029	-0.013	6161	0.140***
1	0.274	2166	0.061	6174	0.213***
2	0.224	2317	0.058	6373	0.166***
3	0.202	2400	0.063	5982	0.139***
Average [0,3]	0.206	6883	0.042	18529	0.164***
Δ AR/Sales					
-1	-0.022	1831	-0.021	4423	-0.001
0	-0.155	2029	0.023	6161	-0.178***
1	0.028	2166	-0.012	6174	0.041***
2	-0.034	2317	0.001	6373	-0.036***
3	-0.025	2400	0.01	5982	-0.035***
Average [0,3]	-0.024	6883	0.008	18529	-0.032***

Panel B. Earnings Management: Chinese Firms Listed in China vs. Overseas					
Window	China	N	Overseas	N	Difference
Total Accruals/Sales					
-1	-0.001	1831	-0.239	352	0.239***
0	0.010	2029	0.214	475	-0.114***
1	-0.101	2166	-0.099	485	-0.002
2	-0.066	2317	-0.088	450	-0.022***
3	-0.044	2400	-0.036	397	-0.008
Average [0,3]	-0.041	6883	0.017	1807	-0.058***
OCF/Sales					
-1	0.212	1831	0.233	313	-0.021*
0	0.127	2029	0.226	420	-0.099
1	0.274	2166	0.195	421	0.079***
2	0.224	2317	0.162	386	0.062***
3	0.202	2400	0.148	340	0.054***
Average [0,3]	0.206	6883	0.182	1567	0.024***
Δ AR/Sales					
-1	-0.022	1831	-0.216	362	0.194**
0	-0.155	2029	-0.177	487	0.022
1	0.028	2166	-0.058	497	0.086***
2	-0.034	2317	-0.007	463	-0.027***
3	-0.025	2400	0.006	409	-0.031***
Average [0,3]	-0.046	6883	-0.059	1856	0.013

Table 7

Investment and Cash Flows: China vs. Other Countries

This table reports the OLS estimates of regressions that examine investment, operating cash flows and net cash flows of listed firms in China. Panel A employs the sample of all firms listed in China and firms listed in other large countries (US, India, Brazil and Japan). Panel B employs the sample of all Chinese firms listed in A-Share and Chinese firms listed in overseas stock market. Investment is measured as capital expenditure scaled by total assets in the prior year. Operating Cash Flow is calculated as EBITDA – Change in Working Capital – Income Taxes. Net Cash Flow is calculated as Operating Cash Flow – Capital Expenditure. In Panel A, the independent variable of interest is *Listed in A-Share*, a dummy taking one if the firm is listed in Shanghai or Shenzhen stock exchanges in mainland China, and zero otherwise. In Panel B, the independent variables are (1) *Foreign-Listed*, a dummy taking one if the Chinese firm is listed in foreign stock market; (2) *Cross-Listed*, a dummy taking one if the Chinese firm is cross listed in both A-share and overseas stock market. We control for both year and the industry fixed effects based on Datastream level-2 industry classification. t-values calculated using the standard errors clustered by listing country are reported in the parentheses. ***, ** and * denote the statistical significance at 1%, 5% and 10% level. See detailed variable definitions in the Appendix.

Panel A. Firms Listed in China vs. Other Large Countries						
Variable	Capital Expenditure/Total Assets (t-1)		Operating Cash Flow/Total Assets		Net Cash Flow/Total Assets	
	(1)	(2)	(3)	(4)	(5)	(6)
Listed in A-Share	0.016*** (4.123)		0.009* (1.803)		-0.006** (-1.964)	
Log (Total Assets)	-0.002*** (-3.311)		0.001 (1.304)		0.005*** (8.362)	
ROA	0.080** (2.491)		0.611*** (10.938)		0.609*** (6.637)	
EBIT Growth	0.000** (2.238)		-0.002*** (-7.623)		-0.003*** (-7.743)	
Leverage	0.050** (2.502)		0.048*** (3.759)		-0.006 (-0.173)	
Sales Growth	0.001*** (2.688)		-0.007*** (-6.574)		-0.008*** (-5.415)	
Intercept	0.060*** (4.685)		-0.005 (-0.253)		-0.047*** (-2.994)	
Year Fixed Effects	Yes		Yes		Yes	
Industry Fixed Effects	Yes		Yes		Yes	
R-squared (%)	19.53		25.07		23.18	
Observations	173139		173139		173139	
Panel B. Chinese Firms Listed Overseas and Cross-Listed						
Variable	Capital Expenditure/Total Assets (t-1)		Operating Cash Flow/Total Assets		Net Cash Flow/Total Assets	
	(1)	(2)	(3)	(4)	(5)	(6)
Foreign-Listed	-0.007 (-1.118)		-0.004 (-0.494)		0.052*** (9.079)	
Cross-Listed		-0.020*** (-8.263)		-0.009 (-1.287)		0.001 (0.177)
Intercept	0.060*** (4.882)	-0.035*** (-2.556)	-0.005 (-0.256)	0.426*** (6.187)	-0.047*** (-2.843)	0.410*** (5.928)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared (%)	18.26	15.55	25.01	7.17	23.69	6.42
Observations	31549	31549	31549	31549	31549	31549

Table 8**Related-Party Transactions, Investment and Net Cash Flows of Listed Firms in China**

This table reports the effects of related party transactions (RPTs) on investment and net cash flows of listed firms in China. Panel A reports the regression results of firm investment on the amount of RPTs. The independent variable of interest is the *lagged-one-year* net amount of outflow in RPTs (*Lagged RPT Net Outflow/Total Assets*), and the interaction of *Lagged RPT Net Outflow* and *Cross-Listed*, a dummy taking one if the firm is cross listed in both A-share and overseas stock market. For each firm in each year, RPT net outflow is calculated as the aggregated amount of money outflow from related-party transactions that the firm is involved in that year minus the total amount of money inflow from such transactions in the same year. We scale the net outflow by the year-end book assets. In columns 3 to 6, we conduct the regressions for state-owned firms (SOEs) and non-state-owned firms (non-SOEs) separately. SOE refers to firms that are ultimately controlled by government agencies. Non-SOE refers to firms with non-government agencies as the ultimate controller. The ownership information is from WIND. We control for other firm characteristics in the prior year. We also control for year and industry fixed effects in all specifications. Panel B reports the regressions results of firm net cash flows on the lagged net outflow from RPTs. Net cash flow is calculated as EBITDA – Change in Working Capital – Income Taxes – Capital Expenditure. The independent variables of interest are the same as in Panel A. T-values calculated using the standard errors clustered by industry are reported in the parentheses. ***, ** and * denote the statistical significance at 1%, 5% and 10% level. See detailed variable definitions in the Appendix.

Panel A. Capital Expenditure/Total Assets						
Variable	All A-Share Firms		SOE		Non-SOE	
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged RPT Net Outflow/Total Assets	-0.014 (-0.631)	-0.018 (-0.778)	0.025 (0.950)	0.017 (0.609)	0.010 (0.253)	0.016 (0.396)
Lagged RPT Net Outflow*Cross-Listed		0.055 (0.606)		0.083 (0.979)		-0.505*** (-3.316)
Cross-Listed		-0.021*** (-4.790)		-0.023*** (-4.523)		-0.023*** (-3.641)
Log (Total Assets)	0.007*** (10.162)	0.008*** (11.311)	0.008*** (8.411)	0.010*** (10.005)	0.007*** (6.737)	0.008*** (6.957)
ROA	0.082*** (9.046)	0.081*** (9.050)	0.103*** (7.128)	0.100*** (7.019)	0.067*** (6.045)	0.066*** (5.984)
Leverage	-0.029*** (-10.980)	-0.030*** (-11.257)	-0.012** (-2.497)	-0.013*** (-2.881)	-0.035*** (-10.867)	-0.035*** (-10.926)
Sales Growth	0.018*** (17.428)	0.018*** (17.409)	0.019*** (12.020)	0.019*** (12.004)	0.017*** (12.628)	0.017*** (12.616)
EBIT Growth	0.002*** (7.160)	0.002*** (6.961)	0.003*** (5.753)	0.002*** (5.460)	0.002*** (4.084)	0.002*** (4.081)
Intercept	-0.025 (-0.803)	-0.038 (-1.277)	-0.028 (-0.524)	-0.055 (-1.075)	-0.043* (-1.793)	-0.045* (-1.893)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Clustered by Industry	Yes	Yes	Yes	Yes	Yes	Yes
R-squared (%)	15.73	15.94	19.43	19.81	14.41	14.53
Observations	34484	34484	15095	15095	19389	19389

Panel B. Net Cash Flows/Total Assets						
Variable	All A-Share Firms		SOE		Non-SOE	
	(1)	(2)	(3)	(4)	(5)	(6)
Lagged RPT Net Outflow/Total Assets	-0.339** (-2.871)	-0.320** (-2.678)	-0.060 (-0.381)	-0.013 (-0.088)	-0.591*** (-3.681)	-0.583*** (-3.622)
Lagged RPT Net Outflow*Cross-Listed		-0.094* (-2.110)		-0.209** (-2.805)		0.008 (0.178)
Cross-Listed		0.007 (1.059)		0.001 (0.016)		0.011 (1.747)
Log (Total Assets)	0.007*** (8.953)	0.007*** (6.922)	0.006*** (4.477)	0.006*** (3.928)	0.008*** (7.181)	0.007*** (5.980)
ROA	0.241*** (4.363)	0.240*** (4.442)	0.138*** (4.406)	0.138*** (4.443)	0.279*** (4.158)	0.277*** (4.268)
Leverage	-0.011 (-1.445)	-0.01 (-1.215)	0.009 (0.755)	0.009 (0.822)	-0.019 (-1.489)	-0.018 (-1.355)
Sales Growth	0.001 (0.056)	0.001 (0.055)	0.001 (0.197)	0.001 (0.173)	0.001 (0.030)	0.001 (0.076)
EBIT Growth	-0.001* (-1.856)	-0.001* (-1.816)	-0.001 (-0.784)	-0.001 (-0.813)	-0.001 (-1.003)	0.001 (-0.967)
Intercept	0.026*** (4.418)	0.025*** (3.904)	0.001 (0.045)	0.001 (-0.017)	0.020** (2.632)	0.017* (2.074)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Clustered by Industry	Yes	Yes	Yes	Yes	Yes	Yes
R-squared (%)	5.53	3.48	6.46	5.55	3.51	6.51
Observations	27922	9233	18689	27922	9233	18689

Table 9

Stock Returns, Operating Performance, and Net Cash Flows of Listed SOE in China

This table compares stock returns, operating performance and cash flows of listed state-owned (SOEs) and listed non-state-owned firms (Non-SOEs) in China. The dependent variables in Panel A, B and C are annual stock returns, return-on-assets and net cash flow/total assets, respectively. Stock returns are in real terms adjusted for inflation, measured by the year-end CPI. SOEs are defined as firms that are ultimately controlled by government agencies, based on the ownership information provided by WIND. The dummy *SOE* takes one if the firm is classified as any types of SOEs. *Central SOE* takes one if the firm is ultimately controlled by central SASAC or Ministry of Finance. *Local SOE* takes on if the firm is ultimately controlled by local SASAC. *Other SOE* takes one if the firm is ultimately controlled by government agencies other than central SASAC, Ministry of Finance and local SASAC. Column 1 uses the sample of all listed SOEs and all listed non-SOEs. Column 2 uses the sample of listed central SOEs and all listed non-SOEs. Column 3 uses the sample of listed local SOEs and all listed non-SOEs. Column 4 uses the sample of listed SOEs of other types and all listed non-SOEs. T-values calculated using the standard errors clustered by industry are reported in the parentheses. We use the level-2 industry classification in Datastream. ***, ** and * denote the statistical significance at 1%, 5% and 10% level. See detailed variable definitions in the Appendix.

Panel A. Annual Stock Returns				
Variable	(1)	(2)	(3)	(4)
SOE	-0.021*** (-2.727)			
Central SOE		-0.026*** (-3.322)		
Local SOE			-0.019* (-1.848)	
Other SOE				-0.005 (-0.252)
Log (Total Assets)	-0.003 (-0.543)	-0.004 (-0.801)	-0.003 (-0.613)	0.004 (0.630)
EBIT Growth	0.002 (0.813)	0.002 (0.989)	0.001 (-0.114)	0.002 (1.268)
ROA	0.325*** (4.582)	0.226*** (3.130)	0.296*** (3.014)	0.283*** (4.488)
Leverage	0.033** (2.066)	0.026 (1.283)	0.043** (2.337)	0.040** (2.403)
Sales Growth	-0.016*** (-2.891)	-0.009 (-1.231)	-0.021*** (-3.617)	-0.01 (-1.371)
Intercept	0.006 (0.072)	0.024 (0.331)	0.012 (0.172)	-0.045 (-0.561)
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
R-squared (%)	54.79	47.57	51.81	44.62
Observations	24043	14397	18758	14654

Panel B. ROA				
Variable	(1)	(2)	(3)	(4)
SOE	-0.009*** (-5.614)			
Central SOE		-0.017*** (-6.470)		
Local SOE			-0.009*** (-4.967)	
Other SOE				0.001 (0.304)
Log (Total Assets)	0.008*** (11.265)	0.008*** (8.478)	0.009*** (10.604)	0.009*** (9.461)
Leverage	-0.042*** (-8.402)	-0.035*** (-5.550)	-0.039*** (-6.997)	-0.033*** (-5.400)
Intercept	-0.008 (-0.528)	-0.004 (-0.256)	-0.023 (-1.435)	-0.018 (-1.134)
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
R-squared (%)	6.07	6.62	6.66	6.78
Observations	24043	14397	18758	14654

Panel C. Net Cash Flow/Total Assets				
Variable	(1)	(2)	(3)	(4)
SOE	-0.023*** (-5.065)			
Central SOE		-0.036*** (-5.457)		
Local SOE			-0.021*** (-4.204)	
Other SOE				-0.030*** (-3.412)
Log (Total Assets)	0.031*** (11.415)	0.035*** (9.257)	0.035*** (10.264)	0.044*** (9.983)
Leverage	-0.131*** (-10.139)	-0.135*** (-7.644)	-0.119*** (-8.179)	-0.147*** (-7.859)
Intercept	-0.052 (-1.061)	-0.074 (-1.072)	-0.018 (-0.284)	-0.125* (-1.833)
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
R-squared (%)	6.59	6.83	6.65	7.56
Observations	24043	14397	18758	14654

Additional Results to “Dissecting the Long-term Performance of the Chinese Stock Market”

Figure A1. Buy-and-Hold Returns of Chinese Firms Listed Overseas

This figure plots the value-weighted buy-and-hold returns (BHR) of the stocks listed in China (A-Share) and Chinese firms listed overseas. We also plot the BHR of Chinese firms listed in Hong Kong and US separately. We calculate the BHR in both local currency (of the listing country) and in Chinese Yuan, using the year-end exchange rate to do the conversion. The BHRs are calculated by accumulating value-weighted annual returns of all stocks listed in the country with the lagged-one-year market capitalization as the weight. The returns are adjusted for stock split and include cash dividends. Nominal returns are adjusted for inflation to be converted to real returns. Inflation is measured by the year-end CPI rate of the listing country. We set the BHR to be 1 in year 2000. We appreciate the CAFR-Chinese stock market research project for sharing with us the stock return data of A-share listed firms. Stock returns of US listed firms are from CRSP. Stock return data for firms listed Hong Kong are extracted from Datastream. Annual stock returns are denominated in local currency. The number of unique Chinese firms listed in A-Share, Hong Kong and US are 2872, 427 and 137, respectively. The number of unique Chinese firms listed overseas which enter the plot is 758.

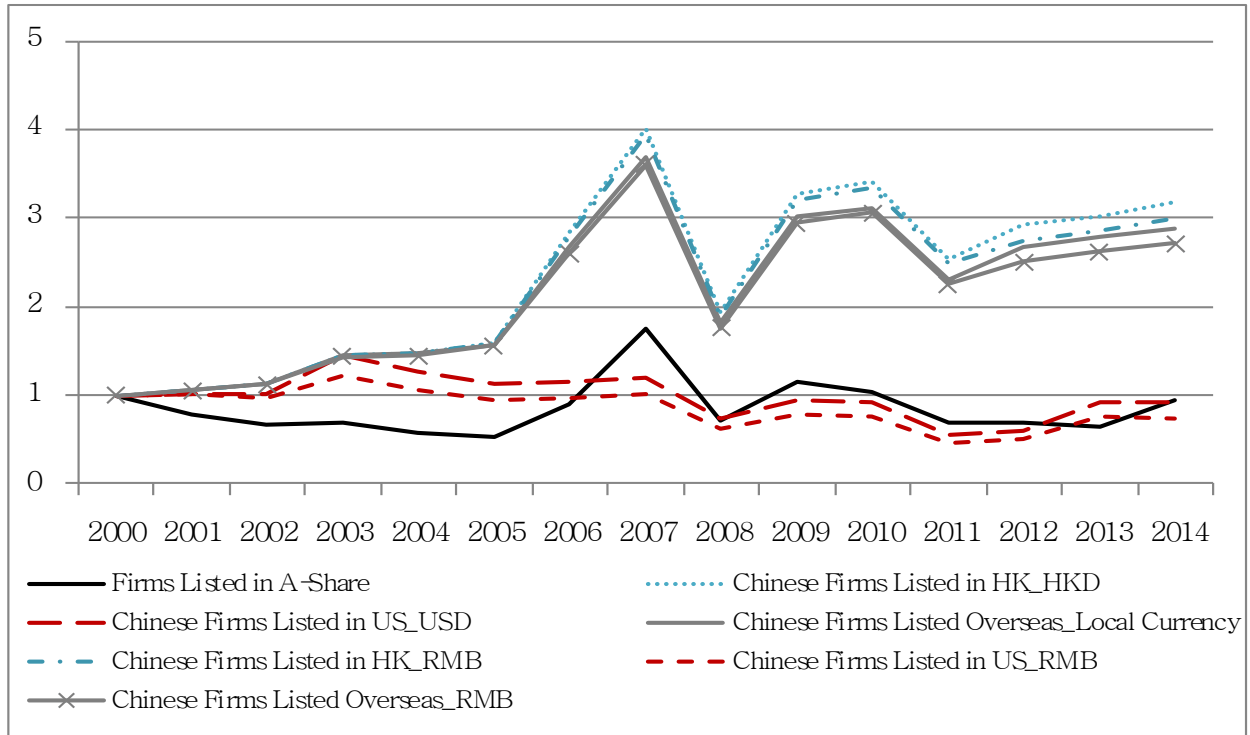


Figure A2. Comparison of Government Bond Yield for China and Other Large Countries

This figure plots the real interest rates of the 5-year government bond for China, United States, India, Brazil and Japan. Bond yields are adjusted for the year-end CPI to be converted to real terms. The government bond yield data for China are extracted from the website of Peoples' Bank of China (PBOC). Data for other countries are extracted from Bloomberg. If the government made more than one bond issuance during a year, we calculate the average yield of these issues in that year.

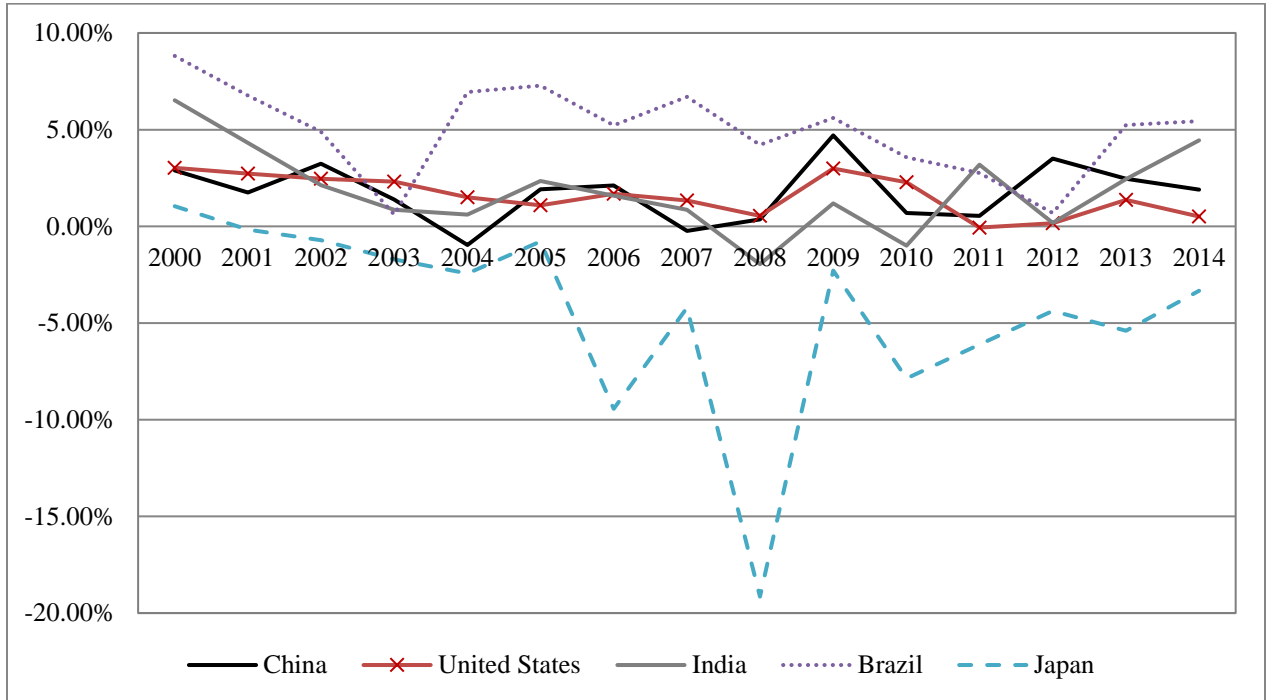


Table A1. Nominal and Real Interest Rates in China

This table lists the nominal and real interest rates in China by year. We present the annual returns on demand deposit, 1-year deposit, 5-year deposit, 3-year government bond, and 5-year government bond in China. We adjust the nominal rates by the year-end CPI to obtain real interest rates.

Year	Nominal Rate					Real Rate				
	Bank Deposit			Government Bond		Bank Deposit			Government Bond	
	Demand Deposit (%)	1-year Deposit (%)	5-year Deposit (%)	3-year Government Bond	5-year Government Bond	Demand Deposit (%)	1-year Deposit (%)	5-year Deposit (%)	3-year Government Bond	5-year Government Bond
2000	0.99	2.25	2.88	2.89	3.14	0.73	1.99	2.62	2.63	2.88
2001	0.99	2.25	2.88	2.08	2.47	0.27	1.53	2.16	1.36	1.75
2002	0.72	1.98	2.79	2.24	2.47	1.49	2.75	3.56	3.01	3.24
2003	0.72	1.98	2.79	2.24	2.54	-0.44	0.82	1.63	1.08	1.38
2004	0.72	2.25	3.60	2.59	2.92	-3.16	-1.63	-0.28	-1.30	-0.97
2005	0.72	2.25	3.60	3.34	3.73	-1.10	0.43	1.78	1.52	1.91
2006	0.72	2.52	4.14	3.24	3.57	-0.74	1.06	2.68	1.78	2.11
2007	0.72	4.14	5.85	3.98	4.52	-4.03	-0.61	1.10	-0.77	-0.23
2008	0.36	2.25	3.60	6.61	6.22	-5.50	-3.61	-2.26	0.75	0.36
2009	0.36	2.25	3.60	3.73	4.00	1.06	2.95	4.30	4.43	4.70
2010	0.36	2.75	4.55	3.73	4.00	-2.95	-0.56	1.24	0.42	0.69
2011	0.50	3.50	5.50	5.39	5.96	-4.91	-1.91	0.09	-0.02	0.55
2012	0.35	3.00	4.75	5.59	6.15	-2.30	0.35	2.10	2.94	3.50
2013	0.35	3.00	4.75	4.58	5.10	-2.28	0.37	2.12	1.95	2.47
2014	0.36	3.11	4.84	3.75	3.89	-1.63	1.12	2.85	1.76	1.90

Table A2. Distribution of Firms by Industry: All Firms in China vs. Firms Listed in A-Share

This table presents the percentages of sales generated by firms in one industry out of sales generated by firms from all industries, excluding financial and real estate sector. Panel A examines all firms operating in mainland China. Panel B examines all firms listed in A-share. We obtain sales information for all firms (both listed and unlisted) from the National Bureau of Statistics (NBS). Data on sales of A-share listed firms are from WIND. We group all firms into 9 industries based on the CSRC industry classification.

Panel A. All Firms									
	Chemical	Computer	Construction &Mining	Consumer Goods	Machinery	Oil&Gas	Retail	Utility	Wholesale
2000	22.12%	6.69%	9.17%	17.73%	11.89%	2.37%	6.00%	4.33%	19.70%
2001	21.77%	7.27%	9.29%	18.04%	12.35%	1.97%	6.13%	4.60%	18.59%
2002	21.33%	7.65%	9.21%	17.97%	12.96%	1.68%	6.12%	4.87%	18.21%
2003	21.32%	8.77%	9.24%	17.40%	13.84%	1.69%	5.98%	4.86%	16.90%
2004	21.27%	8.38%	8.13%	15.48%	12.64%	1.52%	5.52%	5.06%	22.00%
2005	22.79%	8.39%	8.73%	15.77%	12.77%	1.74%	5.61%	5.00%	19.19%
2006	23.27%	8.25%	10.10%	15.34%	13.28%	1.76%	5.37%	5.07%	17.55%
2007	24.29%	7.76%	9.94%	15.43%	14.00%	1.53%	5.05%	4.87%	17.14%
2008	23.15%	6.51%	9.89%	14.83%	13.59%	1.50%	4.44%	5.15%	20.95%
2009	22.50%	6.27%	11.08%	15.83%	14.87%	1.01%	4.67%	5.53%	18.23%
2010	22.53%	6.02%	10.98%	15.09%	14.98%	1.04%	4.33%	5.64%	19.38%
2011	22.65%	5.65%	11.30%	14.69%	14.30%	1.03%	4.10%	5.72%	20.55%
2012	22.83%	5.43%	11.74%	15.38%	13.27%	0.82%	4.05%	5.88%	20.59%
2013	22.20%	5.31%	11.45%	15.34%	13.15%	0.71%	3.79%	6.06%	21.99%
2014	21.49%	5.30%	12.36%	15.23%	13.25%	0.64%	3.61%	6.25%	21.86%
Total	22.45%	6.15%	11.01%	15.39%	13.65%	1.06%	4.35%	5.65%	20.30%

Panel B. Listed Firms									
	Chemical	Computer	Construction &Mining	Consumer Goods	Machinery	Oil&Gas	Retail	Utility	Wholesale
2000	32.67%	10.79%	5.63%	12.57%	16.92%	.	8.49%	5.43%	7.50%
2001	23.18%	7.65%	4.44%	10.06%	12.84%	24.21%	5.96%	5.12%	6.54%
2002	23.36%	7.99%	4.34%	10.69%	13.49%	21.85%	5.95%	5.18%	7.14%
2003	23.90%	9.14%	4.27%	10.06%	13.35%	21.01%	5.54%	4.96%	7.77%
2004	26.78%	7.75%	4.59%	9.11%	12.52%	21.73%	4.98%	5.24%	7.29%
2005	27.69%	7.04%	4.37%	8.48%	11.49%	23.98%	4.82%	5.32%	6.82%
2006	28.56%	6.29%	4.53%	7.94%	11.69%	24.86%	4.46%	5.30%	6.37%
2007	25.35%	4.27%	11.28%	6.06%	11.42%	29.80%	3.45%	3.93%	4.43%
2008	24.66%	3.56%	12.49%	5.58%	11.84%	30.33%	3.42%	3.86%	4.25%
2009	19.24%	3.72%	20.01%	5.74%	13.66%	25.56%	3.90%	4.10%	4.07%
2010	19.64%	4.02%	18.77%	5.39%	14.75%	25.49%	3.80%	3.84%	4.30%
2011	19.47%	3.74%	17.70%	5.67%	14.42%	26.52%	4.20%	3.59%	4.70%
2012	18.04%	3.77%	18.26%	5.98%	13.90%	27.05%	4.36%	3.75%	4.88%
2013	18.21%	3.86%	18.62%	6.09%	14.19%	25.83%	4.35%	3.65%	5.21%
2014	17.81%	4.28%	18.82%	6.11%	15.46%	24.76%	4.22%	3.73%	4.81%
Total	20.34%	4.36%	16.09%	6.27%	13.90%	25.91%	4.22%	3.94%	4.97%

