Explaining the Disconnection between China's Economic Growth and Stock Market Performance*

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Abstract

The size of the Chinese stock market is the second largest in the world. The poor performance of this market over the period 2000-2013, relative to developed and large emerging markets as well as unlisted firms in China, has been striking. This is despite the fact that the Chinese economy, also the second largest in the world, has been the fastest growing economy globally for the past three decades. We examine reasons for the disconnection between economic growth and stock market performance. Problematic IPO and delisting processes exacerbate the adverse selection of firms into 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 also 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 years. At the end of 2014, according to IMF, China has overtaken the U.S. and become the largest economy in the world as measured in Purchasing Power Parity terms (PPP). This is quite remarkable given that in 1980 its GDP was less than 10% of that of the US. 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 Shanghai Stock Exchange (SSE hereafter) and Shenzhen Stock Exchange (SZSE). The market has been growing fast since its inception with a large number of firms being added over the years. Each firm listed at SHSE and SZSE (the "A share" market) must be approved by the Chinese Securities Regulation Commission (CSRC, equivalent to the SEC in the US). In addition, now over 60% of the total market capitalization of the Hong Kong Stock Exchange (HKSE), which follows rules and regulations similar to those in the UK and US and is open to global investors, comprises of companies from (mainland) China ("H share" market). Combining the firms listed and traded in all three exchanges, the Chinese stock market is the second largest in the world, only trailing the US equity markets.

However, the performance of the Chinese equity market has been disappointing, especially compared to the growth of GDP. We start from December 31, 1991 as on December 31, 1990 hardly any stocks were listed. Figure 1, Panel A shows that the real GDP performance of China eclipses that of a number of other large developed and emerging economies. By contrast, the Shanghai composite has been one of the worst performing indexes in the world. In fact, as shown in Figure 2, the real value of the index at the end of 2013 is almost the same as

then; only the Nikkei in Japan and the RTS in Russia have performed nearly as badly. A simple measure to gauge the link between economic growth and stock market performance is the correlations between the two. In this regard, stock market returns in both developed economies, such as the US, UK, Japan, Korea and Taiwan, and large emerging economies, such as South Africa and Brazil, are strong predictors of GDP growth in the following year (Table III). The correlation between market returns and future GDP growth for China, however, is much lower and statistically insignificant.[1]

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 (Figure 1, Panel A) since 1991, and the world's second largest stock market? There is very little rigorous academic research that addresses this question, which is the main purpose of this paper. We compare the performance of the Chinese market and listed firms with those of the other large developing economies—Brazil, Russia, India and South Africa, and use the US and Japan as the benchmark of developed markets. We examine country-, industry and firm-level determinants with a large panel data set that includes over 75,000 firms across 138 exchanges in 89 countries.

The answers to our key question should help policy makers and regulators (e.g., the CSRC) to come up with viable solutions 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 financing firms and economic growth (e.g., Allen, Qian and Qian, 2005; AQQ hereafter) since its inception two decades ago. However, the importance of the equity market is growing, and without a stock market that is a viable investment alternative too many resources go into other

[1] Even with the bull market run started in November 2014, the Chinese market still trails that of US, India and Brazil by a large margin (as of December 31, 2014). In sharp contrast to the rise of the stock market, China's GDP growth is 7.4% in 2014, the lowest in 24 years, and the Chinese economy is expected to grow at even lower rates in the next few years. Another large emerging economy, India, also has low and insignificant correlation between market returns and future GDP growth.

saving vehicles such as real estate and this leads to many costly distortions in the economy. Further development of the stock market represents one of the main tasks for China's financial system.

We draw on three lines of work in developing our tests. First, there is an extensive strand of literature that examines cross-country determinants of financial system development including the stock market. These include a country's strength of laws and institutions, disclosure and accounting standards. The variables identified in prior studies are included in our tests as country-level controls. Second, we draw on the well-established theories and results on measuring the risk and returns of stocks and governance and performance of listed firms. Third, we also utilize research on the Chinese economy, related institutional background and data on unlisted firms in China, to help us identify factors that may be unique to the Chinese equity market and corporate sectors.

Although the Shanghai Composite rose initially after the exchange's establishment in 1990 it subsequently fell dramatically in real terms. This was to a large extent due to the fact that inflation in China was very high in the early 1990s as shown in Figure 3. Moreover, many of the securities laws and regulations were introduced during the late 1990s, and the pace of adding new firms to the exchanges slowed down after 2000. For all of these reasons we focus on the period from December 31, 2000 in the rest of the paper. Figure 1, Panel B shows the GDP growth of the same set of countries as Panel A. The Chinese economy grew by a factor of 3.2 (in real terms) over this period, much faster than all the other countries.

Figure 4, Panel A presents the 'buy and hold' returns based on our calculations aggregated from firm-level returns, from 2000 until March 31, 2014, excluding dividends. Moreover, dividends and share repurchases make little difference; as shown in Figure 4, Panel B,

returns including payouts show very similar patterns with the performance of the Chinese market the worst of the group. So, overall investors in the stock market have had no return in real terms in the long run. In fact, as shown in Figure 5, the cumulative return of the stock market is less than that of standard bank demand deposits (in real terms) with very low nominal interest rates over the same period, and much lower than that of 5-year deposits.

Using both P/E and M/B metrics, we find that listed firms in all the large countries (BRICS and US) all had a substantial run up in valuation leading up to the 2007-2009 global financial crisis and valuation levels peaked in 2007. But Chinese listed firms had much higher valuation levels than firms from other countries. Following the crisis, valuation in all countries fell sharply and then rebounded. They did not rebound by as much in China but the valuation levels of Chinese firms are not lower than those of other emerging economies and developed economies.

Our focus in this paper is to explore the determinants of the poor performance related to "firm fundamentals," including operating performance as measured by ROA (return on assets), ROE (return on equity) and cash flows. Interestingly, despite China's phenomenal GDP growth rates, the average operating performance of Chinese listed firms is unimpressive relative to firms from developed and other large emerging economies, as well as (matched) unlisted firms in China. In terms of industrial output and revenues, unlisted firms, and in particular, privately owned (unlisted) firms have provided the majority of output and growth of China's economy (Table IV).

The first hypothesis to explain the gap between stock market performance and economic growth is that problematic listing and delisting processes worsen the adverse selection of listed firms. Arguably the three most well-known Chinese companies globally are the privately owned

internet giants *BAT—Baidu, Alibaba and Tencent*; they are all publically listed and traded but none of the three is listed in the Chinese A-share market. As mentioned earlier, each IPO firm must be approved by the CSRC and in earlier years this took on the form of explicit quota in a given year allocated to a specific region. Firms must also show profits in consecutive years to satisfy explicit listing standards set by the CSRC. Moreover, one of the stated purposes of establishing the stock market in the first place was to assist the privatization of SOEs through fundraising—i.e., selling shares to the market. Hence, state-owned enterprises (SOEs) and firms with connections to the regulators and related government branches are more likely to be listed, whereas privately-owned firms without high *current* profitability (but with growth potential) face a much higher hurdle. Once listed, firms are rarely delisted in China and the 'shell' of a listed firm is valuable given the difficult listing process.

We find evidence supporting the notion that the IPO and delisting procedure is a major contributor to the gap between the stock market and overall economic growth. It is well documented 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 is the strongest. Prior studies indicate that the operating performance would drop following the IPO year. This phenomenon not only occurs in the US but also in emerging economies as both ROA and ROE of IPO firms drop from the high levels in the IPO year (or the year before the IPO, depending on the IPO process). But listed firms in China 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. This result is robust to controlling for firm and industry characteristics including IPO proceeds. By contrast, unlisted firms matched by industries, size and ROA show no drop in ROA during the same period surrounding listed firms' IPO.

Prior studies show that IPO firms in the US use earnings management to boost their performance before IPO. We show that Chinese firms also use earnings management before IPO, and the degree of manipulation is greater than their US counterparts. Prior research and investor lawsuits also suggest outright frauds of making up revenue and profit figures in order to meet the listing hurdles set by CSRC. Further, our results are consistent with the hypothesis that the listing process also distorts firms' operations in that some firms exhaust their resources and capital and sacrifice their future operations and growth in order to meet the listing standards.

Consistent with the fact that very few firms are delisted in China, we find that firms with similar levels of poor performance are more likely to disappear from the database (due to delisting) in the US and in other emerging economies. After two consecutive years of losses, listed firms in China are labeled "ST" (special treatment) but remain listed and traded in the exchange. Compared to *delisted* firms from developed and developing countries, ST firms in China experience greater drop in performance (ROA and ROE) during the five-year period before ST than other firms prior to delisting. These results suggest that poor-performing firms are not dropped from the stock exchanges, which also negatively affect the overall returns of the market.

The second hypothesis to explain the gap between stock market performance and economic growth is low investment returns. The most important component of China's GDP growth comes from investment, and this is also the case for listed firms. Listed firms in China have much higher levels of investment (CAPEX, relative to assets) than their counterparts in the US, Japan, India and Brazil (Figure 10). However, net cash flows (EBITDA – Changes in Working Capital – Capex) of Chinese listed firms are 0.6% lower than that of firms from the other four countries (Table VIII). Given that the average net cash flows of Chinese firms is

around 2% of assets, the low returns to investment are significant. Over the period of 2007-2013, total net cash flows of Chinese firms are the lowest among the five countries (Figure 11), even lower than that of Japan, which experienced prolonged contractions in the economy. These findings clearly indicate low investment efficiency of listed firms in China.[2] We also explore whether low levels of cash flows can be explained by the fact that listed firms' assets are 'tunneled' by insiders (e.g., large shareholders). Lower net cash flows are associated with more related-party transactions (Table IX), a proxy used in the literature for tunneling by large shareholders. Therefore, poor investment returns can be attributed to deficiencies in corporate governance. Finally, we find listed SOEs have worse fundamentals (ROA, ROE and cash flows) and holding period returns than listed non-SOEs. The association between related party transaction and lower cash flows is also stronger for SOEs, suggesting worse problems in corporate governance.

The rest of the paper is organized as follows. Section II of the paper documents the poor performance of the Chinese stock markets. This is with regard to absolute real returns and relative to risk free rates. Given the growth in GDP, it is particularly poor. Section III investigates the reasons for the poor performance of the Chinese stock market and why real returns have been negative in the long term. We examine three factors: listing process, delisting process and investment. Concluding remarks are contained in Section IV.

II. THE PERFORMANCE OF THE CHINESE STOCK MARKET FROM 2000 TO 2013

A. The Link between Economic Growth and Stock Market Performance

[2] This may reflect a problem for the entire economy—many large scale government-led investment projects have not generated positive returns and have led to misallocation of resources.

Is high economic growth of a country necessarily associated with better stock market performance in this country? We examine the correlation between the current stock returns in one country and the country's GDP growth in the next year for the main economies. As Table III shows, the largest economies, including US, UK and Japan, and major emerging markets, including India, Brazil and South Africa, among others, all see a positive link between the stock returns in the current year and its GDP growth in the next year. In other words, the current stock performance has strong predictability for the future economic growth. Such predictability also exists for smaller emerging markets such as Korea and Taiwan. However, China and India are the two exceptions. The correlation between the country-level stock returns and GDP growth is insignificant for China and India, for both the period 1992-2013, and 2000-2013.

One possible explanation for the disconnection between economic growth and stock market performance is that listed firms in China are not doing well but they only account for a small fraction, so they are not representative of the whole economy. We examine this hypothesis by breaking down all firms into those publicly listed and unlisted sectors, and looking into the correlation between GDP growth and the growth rate of different sectors. We extract the aggregate revenue and net income data from the Statistical Yearbook prepared by the National Bureau of Statistics of the PRC.

As Panel A1 of Table IV shows, the listed firms contributed only 21.8% percentage in terms of total revenue in 2012. Among the listed firms, the state-owned firms (SOE) take a large portion. In 2007, the percentage of revenue made by SOE is as high as 86.81% out of all listed firms. This ratio has been declining after the privatization process in mid-2000s, but it is still as high as 79.77% by 2012. If the listed firms have not been performing well as a whole, then SOEs may have contributed a substantial part of such poor performance.

Table IV shows that the stock market has becoming increasingly important for the Chinese economy, as the percentage of revenue made by listed firms has been steadily increasing over years. Although most of the listed firms are SOEs, non-SOEs comprise the majority of unlisted firms, and the fraction has been growing in the past decades.

A more precise measure of the added value generated by firms is net income. Panel A3 shows that unlisted non-SOEs are more important in terms of generating profits. In 2011, more than 80% of the net income generated by the unlisted corporate sector is from unlisted non-SOEs, compared to the 74% measured by total revenue. It suggests unlisted non-SOEs have higher profitability per unit of sales. In contrast, the share of net income generated by listed SOEs is smaller than its share of revenue in the sector of listed firms, indicating that listed SOEs have lower profitability than listed non-SOEs.

Which corporate sector has contributed more to the whole economic growth? We check the correlation between GDP growth and the grow rate of each sector in Panel B2. Unsurprisingly, the corporate sector as a whole has a strong and positive correlation with the GPD growth (correlation coefficient 0.597, significant at 1% level). The strong correlation is largely attributed to the non-SOE and unlisted firms. Especially the unlisted sector has the highest correlation with GDP growth (0.61, significant at 5% level). However, the net income growth of the sector of SOEs and listed firms shows no correlation with GDP growth. These findings suggest that GDP growth is mainly driven by the growth of unlisted firms.

B. Comparison of Performance of Chinese Stock Market versus Other Major Markets

Next we examine the Chinese stock market performance in the context of all stock markets in the world. We collect most firm-level stock price and accounting information from

Worldscope. We also use WIND and CSMAR to compete the financial and ownership data for Chinese listed firms. Table I shows the distribution of our sample firms listed in China by year. The number of listed firms in China grew steadily from 1,389 to 2,779.

Panel A of Figure 2 shows the performance of the Shanghai Stock Exchange Composite (SSE) index and the stock indices of other major countries from 1992 to 2013. 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. The SSE Index shows almost no growth at all during 2000-2005. It rocketed in 2006 and peaked in 2007. Then it clipped off in 2008, back to the level of 2005, and recovered in 2009. By the end of 2013, the buy-and-hold return of the SSE index is around one, which means that the investor who invested one dollar in a value-weighted portfolio of stocks listed in Shanghai stock exchange in 1992 will get exactly one dollar back in 2013, realizing a net return of zero. The performance of stocks listed in China measured by the cumulative index return is poorer than other emerging countries like Brazil and India, and also poorer than that of US. It only slightly outperformed Japan.

As shown in figure 2, the SSE index sees negative returns in the beginning years of 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 as we plot the real returns. Figure 3 shows that the inflation rate is indeed high in the first half of 1990s in China. The CPI was as high as 27% in the mid-1994. Because of the high inflation rate as well as the anecdotal evidence showing that speculative activities were prevailing in China's stock market in 1990s, 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 1176 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.[3]

Figure 4 shows that China has even more severely underperformed other BRIC countries in terms of value-weighted buy-and-hold stock returns, in the period 2000-2013. The buy-and-hold returns 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. Panel A and B plot the value-weighted BHR with and without cash dividends, respectively. The BHR is adjusted for inflation to be in 2000 local currency. If an investor invested one dollar investment in a value-weighted portfolio composed of Chinese listed stocks in 2000, she will obtain 61 cents by the end of 2013. The gain is 62 cents if cash dividends are included. In other words, investors would have lost around 40% of the value if they invest in Chinese A-shares in 2000 and hold it until 2013.

Is the low BHR due to cash being distributed to investors through dividend payment? Taking 2011 as an example, based on Bloomberg data, the average dividend yield for the Shanghai Composite index was 2.2 percent relative to the earnings generated by listed firms in the same year. As a result, the securities regulator, China Securities Regulatory Commission (CSRC), have been urging listed companies to pay out cash dividends to their shareholders.[4] Panel B of Figure 4 shows the value-weighted buy-and-hold returns including cash dividends. The BHR by the end of 2013 for China merely increases from 0.61 to 0.62.

In contrast, one dollar investment in a worldwide diversified, value-weighted stock portfolio in 2000 generates $1.20 by the end of 2013. The gross return increases to 1.71 if cash

[3] Carpenter, Lu and Whitelaw (2014) 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).

[4] "Shanghai exchange urges dividend reform", *Financial Times*, January 8, 2013.

dividend is also included. As shown by 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 two from 2000 to 2013. The BHR of China in 2013 is even lower than developed economies like US and Japan, whose economic growth has slowed down in the sample period.

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. Table II shows the nominal returns compared to deposit rates in China. Since the banks are majority owned by the government China, the deposit rates are effectively risk free rates. The table shows that the stock market underperformed the five-year risk free rate. Although the nominal five-year deposit rates increased from 2.88 in 2000 to 4.75 in 2012, the real deposit rates didn't increase. The similar patterns are found for the 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 return underperformed the cumulative one-year and five-year deposit rates. It is even lower than the cumulative demand deposit rates since 2011.

C. A Cross-Country Prediction Model of Stock Performance

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 and country-level variables. The set of variables include: (1) firm financial performance and characteristics; (2) stock market characteristics, especially liquidity and risk; (3) country-level macro-economic conditions such as GDP growth, the amount of bank financing to GDP ratio, etc; (4) investor protection measures developed by previous law and finance literature (La Porta, Lopez-De-Silanes, Shleifer and Vishny, 2002, Djankov, Porta, Lopez-de-Silanes and Shleifer, 2008). In specifications in even columns, we also include earnings management score which measures the general severity of firm managers to manipulate accounting information, following Leuz, Nanda and Wysocki (2003), and Leuz (2010)[5] All explanatory variables are lagged by one year when entering the regressions.

Table V presents the ordinary least squares (OLS) estimates of the prediction model of buy-and-hold returns and annual Sharpe Ratio. We exclude countries that have fewer than 20 stocks in a given year. We exclude firms listed in China when estimating the prediction model. The prediction model is estimated for the 1991-2013 period and the 2000-2013 period. As shown by the models 1 to 4, firms with larger size, lower leverage, higher sales growth, and greater risks measured by return volatilities see a larger buy-and-hold return on average. At country-level, higher GDP growth, deeper stock market (measured by number of listed firms per capita), and higher bank credits to GDP ratio are associated with better stock performance. Firms listed in a country with lower incentive for tax evasion see higher BHR. Other country-level variables don't have significant impact on BHR and Sharpe Ratio in most of the times. In the Sharpe Ratio regressions, a lower stock market turnover ratio is associated with higher Sharpe Ratios. Firm managers' earnings management activities have a negative impact on stock performance.

[5] Leuz, Nanda and Wysocki (2003) calculate the earnings management score for XX countries, not including China. We follow their approach to calculate the earnings management score for China. By construction, a higher earnings management score represents stronger incentive of firm managements to conceal firm earnings to get private benefit.

We include Chinese listed firms in models 5 and 6. The negative coefficients of the China dummy show that firms listed in China have substantial lower buy-and-hold returns, when firm- and country-level characteristics are controlled for. On average, firms listed in China underperformed firms listed in other countries by 2.8 in BHR and by 0.52 in annual Sharpe Ratio in the period 2000-2013. The regression results suggest that the underperformance is not explained by country-level institutional features, nor driven any year or industry fixed effects. The Sharpe Ratio results further corroborate the view that the poor performance of Chinese stocks is not explained by risk. Actually, Chinese stock market has higher volatility than US market when we use monthly or daily stock index to estimate the standard deviation.

The stock market in mainland China is composed of Shanghai and Shenzhen stock exchanges. In our sample, stocks listed in Hong Kong market is *not* counted as Chinese stocks. But the majority of the stocks listed in Hong Kong are Chinese firms. We further compare the stock performance in Shanghai, Shenzhen and Hong Kong exchanges. Sample firms listed in Shanghai and Shenzhen exchanges are restricted to those on the main board. We find that the stock performance in Shanghai and Shenzhen tracked each other closely in most of the years during our sample period. Shanghai started to underperform Shenzhen and Hong Kong since the 2008 credit crisis. By the end of 2013, Shanghai shows the lowest BHR which is below 0.6. Shenzhen is ranked second, with a BHR around 0.8. Hon g Kong market has the BHR of 1.8, which means that investors can make positive returns if they buy the market portfolio in 2000 and hold it until 2013.

Besides the main board, Chinese stock market also comprises SME (the small-and-medium sized enterprises) board and the GEM (the growth enterprise market, similar to Nasdaq). As their names suggest, the SME board comprises firms of smaller size (the number of tradable

shares is smaller than 100 million).[6] We further compare the performance of Shanghai Composite Index, the CSI 300, and the SME Composite. CSI covers the largest 300 stocks by market capitalization from Shanghai and Shenzhen exchange. The SSE SME Composite covers A-shares listed in the small-and-medium sized enterprise (SME) board of the Shenzhen exchange, excluding ST stocks. We start the comparison from 2005 because the CSI 300 Index was introduced then. From 2005 to 2013, the SME Composite shows the highest cumulative returns followed by CSI 300, and Shanghai Composite is at the bottom. The results show that SME has better stock performance than big listed firms in the main board. The growth enterprise market index (GEM) introduced on June 1, 2010 shows lower returns than Shanghai Composite in 2010-2012 but picked up in 2013.

III. POSSIBLE REASONS FOR CHINA'S STOCK MARKETS TO PERFORM POORLY

To explore the reason for the poor performance of Chinese stock market, we start our analysis by comparing the operating performance of listed firms and non-listed firms in China by calendar year. Because listed firms are usually of greater size, we only compare listed firms with their size-matched non-listed firms from the same industry. We also require that the matching firm has its assets within the [80%, 120%] range relative to the listed firm. Figure 6 plots the average ROA and ROE of the two groups firms. In most of the years, non-listed firms have better operating performance than listed firms, in terms of both ROA and ROE. This is our first evidence showing that in China, listed firms may not be the best performing firms. Our next task is to understand why the Chinese stock market is composed of relatively poor-performing firms.

[6] 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.

A. The IPO Process in China

We start by investigating whether the poor performance of Chinese stock market is due to the flawed IPO process. The IPO process can be problematic in twofold. First, the IPO selection process is not 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.

We examine the IPO process by comparing the performance of listed firms and their matched non-listed firms around the IPO year. We keep only listed firms with non-missing financial information from three years before its IPO to three years after its IPO. We then pair each listed firm with one matching firm by selecting from non-listed firms in the same level-2 industry with the nearest book assets at the end of the third year prior to IPO. Financial information for non-listed firms is obtained from the Annual Survey of Industrial Firms (ASIF) database provided by National Bureau Statistics (NBS). Among the 1,693 Chinese listed firms with non-missing financial data, 594 are ultimately matched with one non-listed firm. We also require that the matching firms have non-missing financial data from three years before the IPO to three years after the IPO. 184 matching firms meet the criteria.

Figure 7 shows the operating performance of listed firms and their matching firms around the IPO year. As Panel A shows, the two groups of firms have similar operating performance in terms of ROA in year -3 before IPO. The listed firms see significant drop in their ROA in the IPO year (from 0.12 to 0.07), while IPO of the matched non-listed firms does not change much over the years. The plot of ROE in Panel B shows a similar pattern. The listed firms have

substantially higher ROE than private firms prior to the IPO, but the ROE decreased nearly half in the IPO year. It remains lower than private firms after IPO.

The substantial drop in operating performance of listed firms could be because these firms conduct earnings management in the years before IPO, because firms have to meet a set of strict listing standard set by regulators.[7] Another even more severe concern is that these strict 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 see such great drops in earnings in the IPO year and afterwards. Results of regressions that control for the pre-IPO firm financial condition show consistent patterns.

Table VI shows the international comparison of changes in operating performance around IPO for the listed firms in China and in other countries. Compared with other countries, firms listed in China see their ROA drop more than the average of listed firms in other countries by 0.03 in the IPO window [-1, +1], controlling for firm and country characteristics prior to IPO. The drop in ROA, ROE and ROS in alternative window [-2, +2] is similar. In all specifications we control for year and industry fixed effects. Thus, the observed larger drops in the earnings of listed firms in China are not driven by certain year or industry effects. One concern is that the bigger drop in ROA and ROE may be because Chinese firms raise more capital in IPO. To address this concern, we control for the average IPO proceeds, as well as the difference in the

[7] 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

expected shares to be sold and the actual shares sold (average allotment). The negative coefficients of the China dummy remain significant.

To detail the analysis, we separate the firms into different cohorts by their listing year. We broadly classify firms into three groups: cohort 2000-2003 (firms listed in 2000-2003), cohort 2004-2006 and cohort 2007-2009. We examine the operating performance of the three cohorts around their IPO year. As figure 8 shows, firms in all three cohorts show similar decline in ROA and ROE in the post-IPO years, suggesting that the deteriorating performance is not a specific phenomenon that occurs in certain years during the sample period.[8]

B. The Delisting Process in China

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.[9] This percentage is far below the average of other markets, which is around 10%-20%. The inefficient delisting mechanism may have also contributed to the poor performance of the Chinese stock market.

Ideally we need compare the operating performance of firms before 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 delisted firms in other countries. We define the year when the firm is delisted, or received "ST" for the first time as year 0. Some firms received ST only once, while others received ST for multiple times. Among the more than 2000 listed firms in China, 527

[8] 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.

[9] Other delisting reason include M&A, privatization, etc.

firms ever received “ST”, and 82 of them are permanent “ST”. To make a sensible comparison, we compare only those which become ST and never emerged from it (the permanent ST) with the delisted stocks in other countries. We require the firms have financial information available from five years before the delisting (ST) until the delisting (ST) year. Figure 10 shows that ST stocks in China dropped significantly from two years before the ST year, while the delisted stocks in other countries do not see their ROA become significantly worse before delisting. Compared with other major emerging countries (including India, Brazil, Russia and South Africa), the decline in ROA for Chinese ST stocks is even striking because the delisted stocks in these reference countries don’t have negative ROA even when they are delisted. The contrast is similar when we use ROE to measure firms’ performance in Panel B of Figure 9.

These findings suggest that the delisting process in China is likely to be efficient, because some of the Chinese listed firms perform even worse than the delisted firms in other countries. These poorly-performing firms existed in Chinese market for long and have contributed to the poor stock performance.

We further examine what explains the substantial drop in operating performance for Chinese firms post-IPO. 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 got listed, all grow 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. We compare China and US. As Table VII shows, in the IPO year, there is sharp decline in total accruals and accounts receivables for Chinese listed firms. This would happen if the firm extends large amount of credit sales before IPO. As the credit sales start to be paid but new sales have not been generated, total accruals and accounts receivables will decline. Panel B, C and D describe

the situation in the subsequent years after IPO. Compared with firms listed in US, Chinese firms continue to see drops in receivables and increase in their inventories, indicating that their sales growth slows down after IPO and inventories are piling up. This is a clear evidence for the hypothesis that Chinese firms may attempt to carve out temporarily profitable business in order to meet the listing criteria at the expense of sacrificing their long-term growth.

C. Investment and Tunneling

C.1 Cash Flows of Listed Firms

Although Chinese stocks perform worse than other countries, the listed firms in China are still making positive earnings. A natural question is why the positive earnings are not accumulated to generate higher valuations for firms. One possible reason is that firms listed in China make larger but less efficient investment. We plot the investment size of China and other main countries in Figure 10. We measure investment size by capital expenditure, scaled by the book assets in the previous year. As demonstrated by Figure 10, listed firms in China make largest investment than listed firm in US, India, Brazil and Japan. The average capital expenditure to lagged assets ratio if 0.08, and this ratio is only around 3.5% for US firms.

We further examine the cash flows of listed firms. We examine the value-weighted operating cash flow and net cash flow for China and other main countries in Figure 11, with book assets as the weight. The operating cash flow is calculated as EBITDA – change in working capital – income taxes. As shown by Panel A of Figure 11, the average operating cash flow for listed firms in China is in the middle of the pack – it was higher than India, US and Japan but lower than Brazil before 2007. It started to drop in 2008 and was below US from 2010.

Although the operating cash flow looks fine for Chinese firms, their net cash flow has been disappointing. The net cash flow is Total cash flow is calculated as EBITDA – change in working capital – capital expenditure – income taxes. The listed firms in China have the lowest net cash flow since 2007, and have negative cash flow for three consecutive years 2008-2010. Even before 2007, the average net cash flow of Chinese firms is lower than Brazil, India and US for most of the years. It was only better than Japan. This plot conveys consistent message with Figure 10 and further corroborates the view that Chinese firms make more but less efficient investment. These findings may well explain why the Chinese stock market has been performing poorly in the past decades.

To account for firm characteristics, we conduct weighted-least-squares (WLS) regressions of the cash flow measures on lagged firm characteristics, including book assets, leverage, growth opportunities, and report the estimation results in Table VIII. Panel A shows that the China dummy has insignificant coefficient in the operating cash flow regressions, but significantly negative coefficient (-0.006) in the net cash flow regressions, which suggests that the net cash flow of listed firms in China is 0.006 below the average of listed firms in other countries.

Which industries in China have been performing worst? Based on the level-2 industry classification in Datastream, we can classify listed firms in major countries into 10 industries: basic materials, consumer goods, consumer services, financials, healthcare, industrial, oil and gas, technology, telecommunication, and utilities. We conduct the same regressions by industries. The results are broadly consistent with the univariate analysis. Panel C shows that, when firm characteristics are accounted for, firms in the financials and industrials in China still have significantly lower net cashflow than those in the same industries from other main

countries. The China dummy has positive loadings in the regressions for 3 industries: basic materials, oil&gas and telecommunications. These are industries in which large firms which have great monopoly power are concentrated in, and these firms may have better accounting performance.

C.2 Related-Party Transactions, Cash Flows and Investment

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 subsidiaries or related parties, or by paying for the debt and expenses. These tunneling related activities may be associated with related-party transactions. The most common related party transactions involve the buy and sell of goods and labors, while other activities may also be relevant, such as leasing, mergers, assets spinoffs, etc. The related party transactions can result in cash outflow or cash inflow. We obtain the related-party transaction information from CSMAR. It provides the type, amount, direction and date of all transactions that involve listed firms.

To find out whether the firms' cash flow and investment are a result of the related-party transactions, we aggregate the transactions for each firm to obtain the total amount outflow by year. We also calculate the net RPT outflow by subtracting the aggregated money inflow from the total amount outflow. Then we regress the firm's net cash flow and investment size on the two measures of RPT amount. The estimation results in Table IX show that the net RPT outflow are negatively associated with net cash flow, and positively associated with capital expenditure, suggesting that related party transactions indeed relate to corporate investment activities and diminish firms' net cash flow. In the meanwhile, the associations are stronger for SOEs, indicating that SOEs are more likely to be involved in tunneling of assets by large shareholders.

Which types of firms in China have contributed more the underperformace of earnings and cashflows? We decompose the listed firms into state-owned firms (SOE) and non-state-owned firms (non-SOE), and compare their operating performance with other listed firms in China. Panel A of Table X shows that on average, SOEs have lower buy-and-hold returns on their listed stocks than non-SOE. The underperformance is especially more severe for those controlled by central or local State-owned Assets Supervision and Administration Commission of the State Council (SASAC). Panel B and C show that SOEs generate lower earnings than non-SOEs by 0.014 (or 20.6% relative to the mean of non-SOEs) and lower operating cash flow by 0.004 (or 5% relative to the mean of non-SOE). The average net cash flow of SOE is merely 0.009, one third of that of non-SOE. These findings suggest the listed SOEs in China have the most severe problems in their investment efficiency and issues related to corporate governance.

D. Performance of Chinese ADRs

So far we have shown evidence for the low profitability, low investment efficiency, and tunneling problem of Chinese firms (firms that are headquartered in China) and their deteriorating performance after listing. To further understand whether the problematic listing process is the dominating reason responsible for the poor performance of Chinese stock market, we compare the stock performance of Chinese firms that are listed in local market and listed in overseas market like US. We distinguish Chinese firms using firm headquarter information provided in Datastream. In an untabulated figure, we show that firms that are headquartered in China but listed in overseas market like Hong Kong, Singapore, UK and US see much higher buy-and-hold returns during our sample period. The average value-weighted buy-and-hold returns by the end of 2013 is over 3, which is significantly higher than the buy-and-hold returns of the corresponding major stock indices in that market. This finding provides part of the answer

to the question "there is a disconnection between Chinese stock market performance and its economic growth": some of the good firms, which may have contributed to the rapid economic growth in China, chose to be listed in overseas market, while those of poor quality are listed in local market and lead to the poor performance of Chinese stock market.

E. Alternative Explanations

E.1 Risk

An alternative explanation for the poor performance of the Chinese stock market is that the risk is changing. We control for the cumulative stock return volatilities in the BHR regressions, and find that the underperformance of the listed stocks in China still remains. To further account for risk, we construct annual Sharpe Ratio of stocks using the monthly stock returns extracted from Bloomberg. Figure 12 shows the plots of the average of annual Sharpe Ratio of stocks listed in China and the reference countries. The Sharpe Ratio for China is lower than other countries before 2006. It is the highest in the 2007 bubble period and the 2008-09 crisis period. When controlling for firm and countries characteristics in Table III, the Sharpe Ratio for Chinese listed stocks is still lower. Panel B of figure 12 shows there is no big change in stock return volatilities over the years, indicating that risks do not explain the poor performance of Chinese stock market.

E.2 Interest Rates and Valuation

If interest rates rise, then market values will drop for given assets and cash flows. So one explanation of the decreasing market values despite the inflow of cash is that interest rates have risen. However, the figures in Table II show that this is not the case. In fact if anything interest rates have fallen. The real demand deposit rates decline from -0.51% in 2000 to -2.15% 2012. The 1-year deposit rate in 2012 is 0.5%, slightly lower than that in 2000. The 5-year deposit rates

also didn't increase significantly over the years. Therefore, we don't find any evidence that the lower stock returns are due to increasing interest rates.

Figure 13 plots the valuations of listed firms over the sample period. We construct the price-to-earnings ratio and the market-to-book ratio at country-level. We aggregate the market capitalization across stocks within a country and divide it by the aggregated net income of their issuing firms. Since the market capitalization is at the security-level, we multiplied the net income by the ratio of market capitalization of a security to the market capitalization of its issuing firm to obtain the security-level net income. In this way we ensure the consistency of the measurement of the denominator and the numeration. Market-to-book ratio is calculated in the same way. As can be seen from Figure 13, the P/E ratio is high in early 2000, but it declines over the years, except for year 2007 and 2009. The spike in 2007 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. To survive in the crisis, firms may fire sell their assets to obtain liquidity, leading to high valuation in 2009. The decreasing valuation of firms may suggest that Chinese listed firms lack growth opportunities in the past decade.

IV. CONCLUSION

The size of the Chinese stock market, including stocks listed and traded in Shanghai, Shenzhen and Hong Kong exchanges, is the second largest in the world. The underperformance of this market, especially since the recent global financial crisis, relative to both developed (US and Japan) and large emerging economies (Brazil, India and South Africa) has been striking. This is despite the fact that the Chinese economy, also the second largest in the world, has been

the fastest growing globally for the past three decades. With firm-level data from over 80 countries for the period 2000-2013, we examine the determinants of the underperformance of the overall Chinese market as well as stocks in each major industry. The poor performance is not due to undervaluation of Chinese companies; instead, factors such as the IPO and delisting processes, corporate governance related to investment efficiency, self-dealing and information disclosure are main contributors.

The answers to our key question would help policy makers and regulators (e.g., the CSRC) to come up with viable solutions 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 financing firms and economic growth for most of the past two decades. However, the importance of the equity market is growing, and its further development represents one of the main tasks for China's financial system.

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Appendix
Data Sources and Variable Definitions

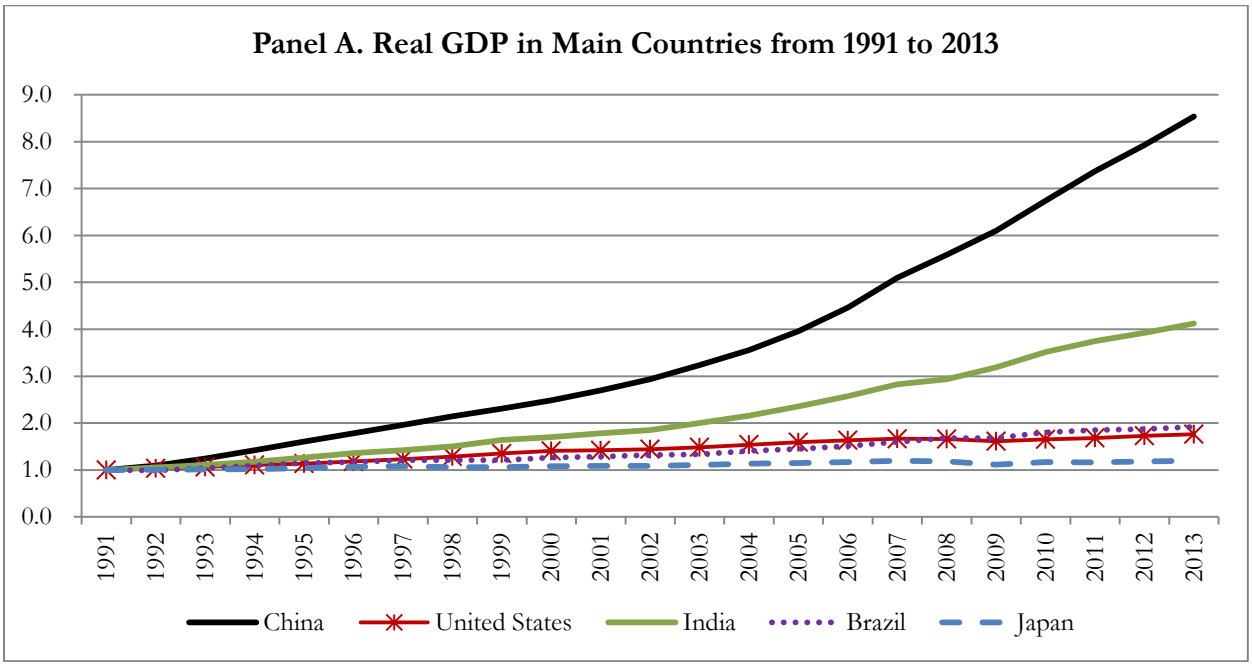
Variable	Definition
Worldscope (Datastream)	
Security-level Variables	
Buy-and-Hold Return	The real cumulative annual stock return in USD, adjusted for inflation (measured by CPI) and set to be one in the starting year
P/E	The market capitalization of security j over the net income of the issuing firm. For firms listed in more than one exchange, the firm-level net income is split by the weight of market capitalization of stocks issued by the firm in all exchanges. We multiply the firm-level net income by the weight to obtain the security-level net income, and use the security-level net income as the denominator in the P/E ratio
M/B	The market capitalization of security j over the book equity of the issuing firm. For firms listed in more than one exchange, the book equity is split by the weight of market capitalization of the stocks issued by the same firm in all exchanges. We multiply the firm-level book equity by the weight to obtain the security-level book equity, and use the security-level book equity as the denominator in the M/B ratio
Firm-level Variables	
Operating Cashflow	EBITDA – changes in working capital – income taxes
Net Cashflow	Operating cashflow – capital expenditure
Cash Holdings	Total cash in year t/Total assets in year t
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-1
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
Investment Size	Capital expenditure over book assets in the prior year
Country-level Variables	
P/E	The aggregated market capitalization of all stocks listed in a country over the aggregated net income of the same firms. For firms listed in more than one exchange, the firm-level net income is split by the weight of market capitalization of stocks issued by the firm in all exchanges
M/B	The aggregated market capitalization of all stocks listed in a country over the aggregated book equity of the same firms. For firms listed in more than one exchange, the book assets are split by the relative weight of market capitalization of stocks issued by the same firm in all exchanges
ROA	The aggregated EBIT in year t for country i/The aggregated total assets in year t for country i
ROE	The aggregated net income in year t for country i/The aggregated book equity in year t for country i
ROS	The aggregated EBIT in year t for country i/The aggregated sales in year t for country i
Value-Weighted Buy-and-Hold	The cumulative annual stock returns since 2000. The annual stock returns are calculated as the value-weighted stock returns across all firms listed in this country, with the market

Return	capitalization of the firm as the weight. For firms issuing stocks listed in more than one exchange, the weight is market capitalization of the stock in each exchange
Number of Listed Firms/GDP	The total number of listed firms in a country over its GDP in the current year
Bloomberg	
Sharpe Ratio	Annual excess return over annualized standard deviation of monthly returns. Annual excess return is calculated as the monthly stock return multiplied by 12 less risk free rate. Annual stock return volatility is calculated as the monthly stock return volatility multiplied by 12
Compustat	
Investment (for US firms)	Capital expenditure/Lagged total assets
National Bureau Statistics (NBS) Statistical Yearbook	
Aggregate Output	The aggregated output of all industrial firms (both listed and non-listed) in China
Aggregate Revenue	The aggregated revenue of all industrial firms (both listed and non-listed) in China
National Bureau Statistics (NBS) ASIF	
	ASIF is used to construct ROA, ROE, ROS, leverage, sales growth, earnings growth and other variables for non-listed firms in China. The variable definitions are the same as those for listed firms. ASIF data covers the period 1998-2007
WIND	
Investment (for Chinese firms)	Capital expenditure/Lagged Total Assets. In WIND, capital expenditure is reported as "cash flow on fixed assets"
CSMAR	
Ultimate Controller	The entity that ultimately controls the firm. The ultimate controlled can be the central SASAC, local SASAC, Ministry of Finance, other government agent, other non-enterprise organizations, universities, group companies, natural person, among others
Ownership of Ultimate Controller	The percentage of shares held by the ultimate controller
World Bank	
GDP Growth	The real GDP growth rate adjusted for inflation in local currency, extracted from World Bank database
Domestic Credit from Financial Sector to GDP Ratio	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 (including corporations that do not accept transferable deposits but do incur such liabilities as time and savings deposits). Examples of other financial corporations are finance and leasing companies, money lenders, insurance corporations, pension funds, and foreign exchange companies
World Federation of Exchanges	
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
Djankov et al. (2008)	
Anti-self-dealing index	Average of ex-ante and ex-post private control of self-dealing, ranging from zero to one
Ln GDP/POP	Logarithmic of per capita Gross Domestic Product (in US dollars) in 2003. Source: World Development Indicators at http://devdata.worldbank.org/dataonline/
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)
Newspaper circulation	Logarithmic of newspapers and periodicals circulation per thousand inhabitants in 2000 (or closest available). Source: United Nations Statistical Database (http://unstats.un.org)

English	A dummy variable taking the value of one if the country has an English legal origin; and zero it the country has other legal origin (French, German or Scandinavian)
Leuz et al. (2003)	
Earnings Management	This measure for countries other than China is extracted from Table II of Leuz et al. (2003). We follow Table II of Leuz et al. (2003) to construct this measure for China. By construction, a larger number represents more earnings management going on in the firms listed in this country.

Figure 1. Real GDP in Main Countries from 1991 to 2013

This figure plots the real GDP of China and other major countries. Real GDP data are extracted from WDI under the item "GDP (constant LCU)" in the World Bank database. The GDP value is normalized to 1 in the starting year. Panel A plots the real GDP of China and other major countries from 1991 to 2013. Panel B plots the real GDP of China and other major countries from 2000 to 2013. The GDP value is in constant local currency, adjusted for the CPI at the end of the year.



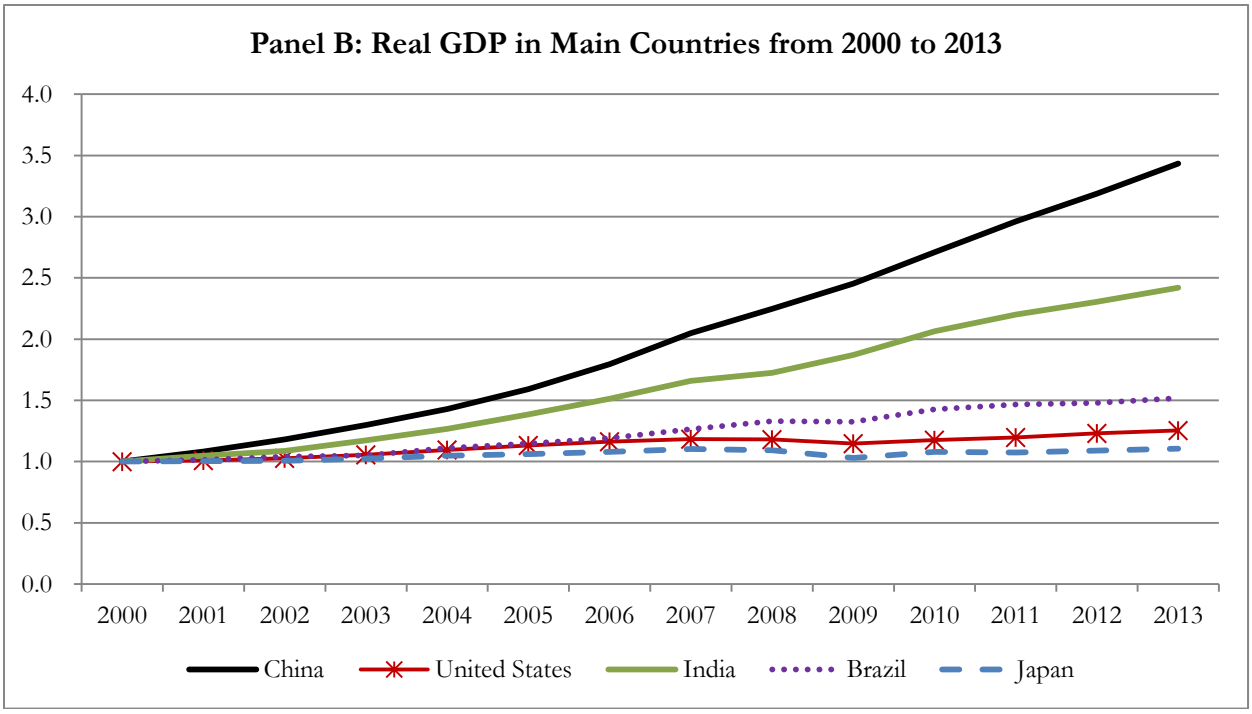


Figure 2. Cumulative Returns on Major Indices from 1993 to 2013

The figure plots the real cumulative returns of major stock indices from 1992 to 2014Q1. We cumulated the annual returns from 1992 to 2013, and the quarterly return of 2014Q1. The indices are: SSE Composite Index (China), S&P 500 (US), BSE Sensex (India), IBOV (Brazil) and Nikkei 225 (Japan). Stock return data are collected from Bloomberg. The nominal returns are adjusted for inflation, measured by the year-end CPI, to be converted to real returns.

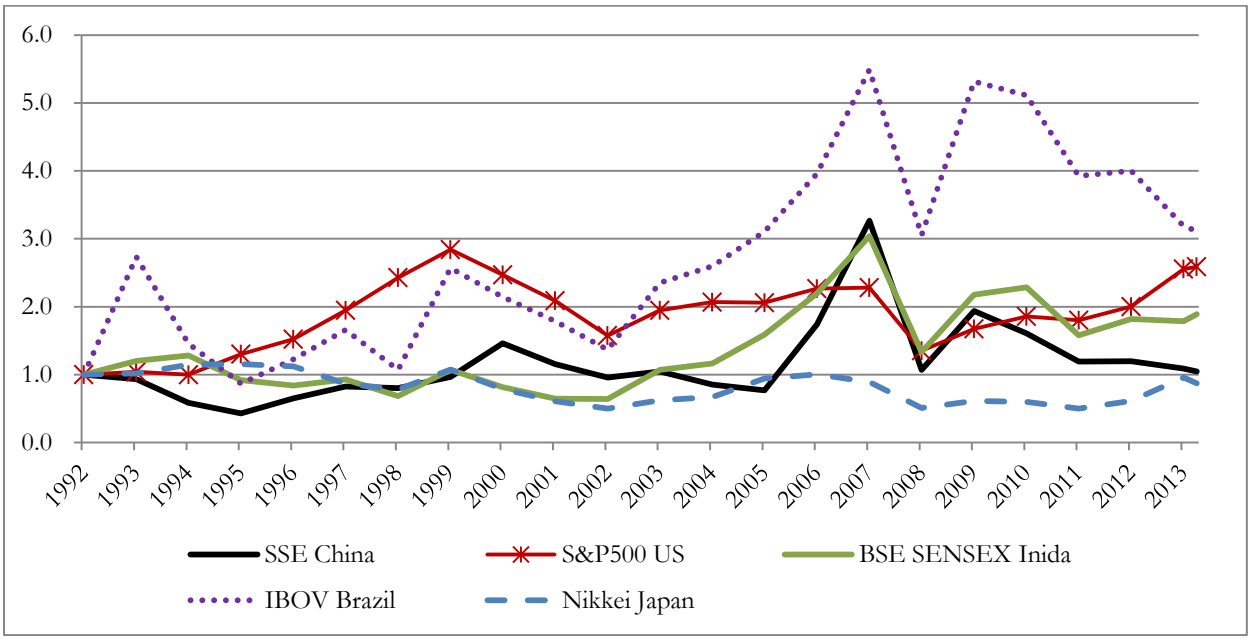
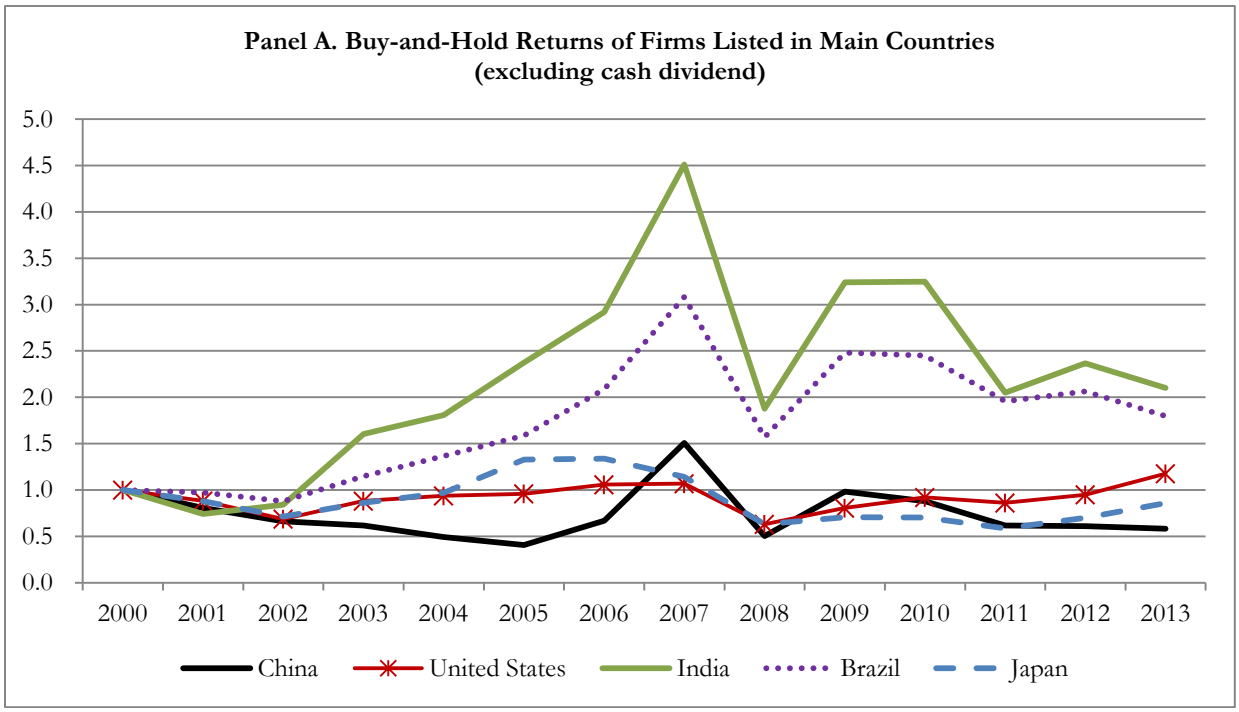


Figure 3. Monthly Inflation Rate in China

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

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

This figure plots the value-weight buy-and-hold returns (BHR) of the stocks listed in China and other major countries. Panel A plots the BHR excluding cash dividends. Panel B plots the BHR including the cash dividends. For each country, the BHR are calculated by accumulating value-weighted annual real returns of all stocks listed in the country with the lagged-one-year market capitalization as the weight. Nominal returns are adjusted for inflation to be converted to real returns. Inflation is measured by CPI rate of the listing country in the same year. We set the BHR to be 1 in year 2000. Annual stock returns are in local currency and extracted from Datastream.



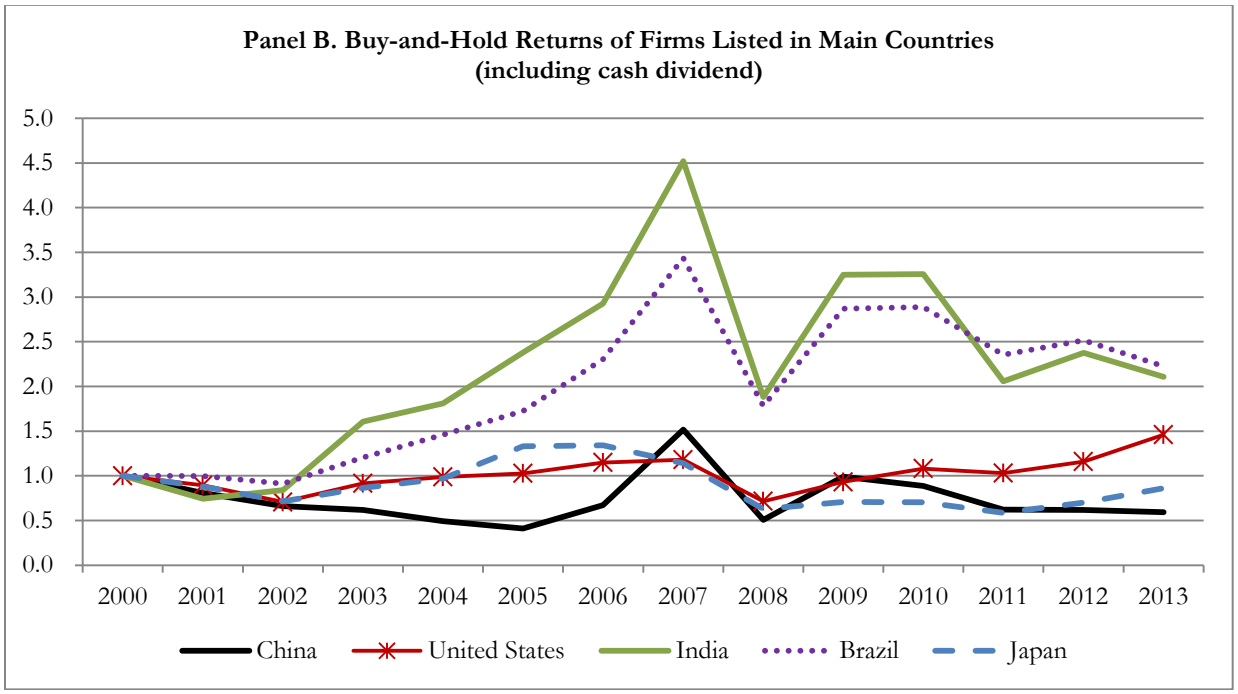


Figure 5. Comparison of Cumulative Returns on Deposits and Stocks Listed in China

This figure plots the real buy-and-hold returns on deposits and stocks listed in China. The line represents the value-weighted buy-and-hold returns of stocks in China, with the lagged-one-year market capitalization as the weight. The bars represent cumulative returns on demand deposits, 1-year and 5-year deposits in China. Both returns on deposits and stocks are adjusted for inflation in the same year to be converted to real returns.

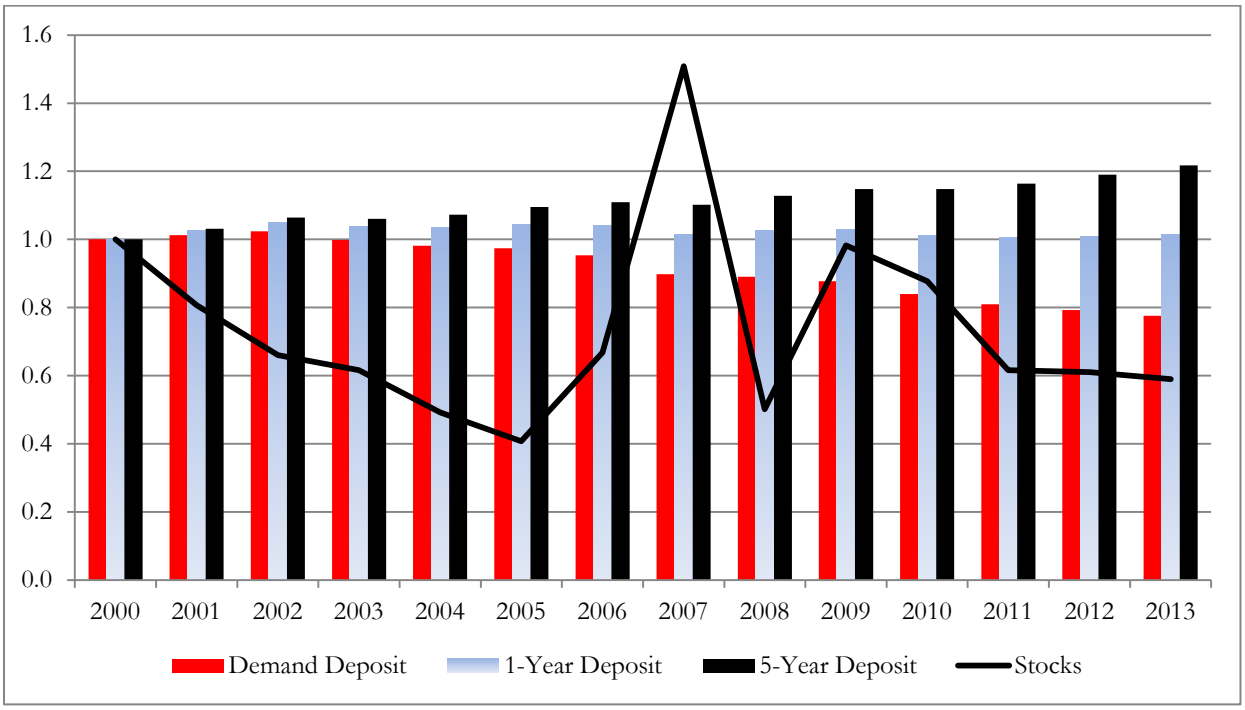
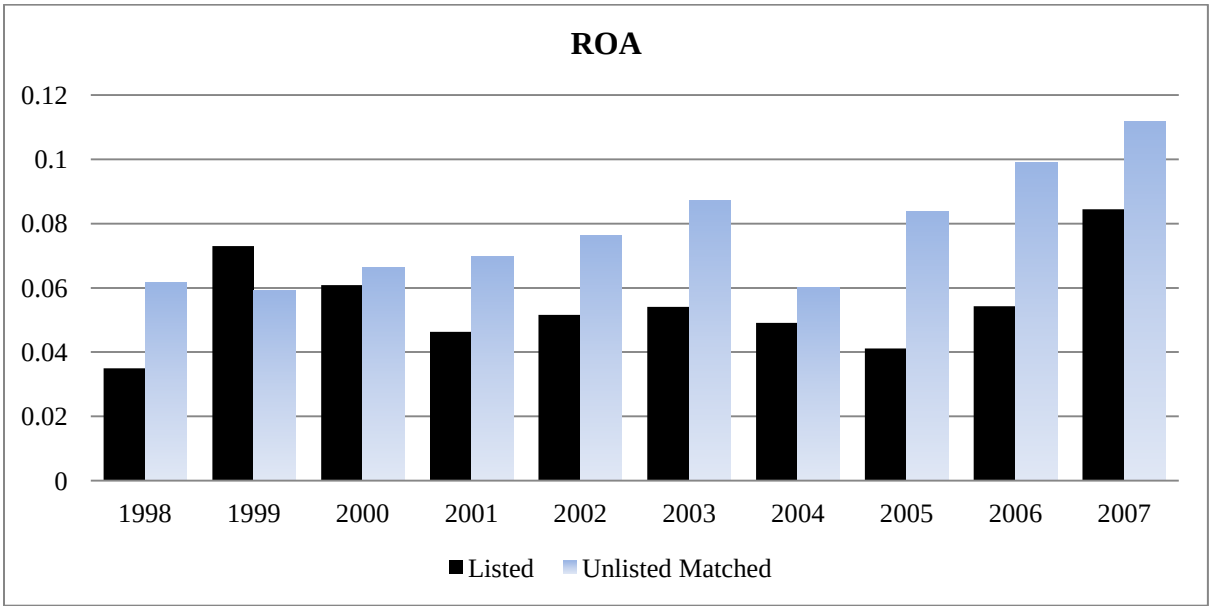


Figure 6. Operating performance of Listed Firms and Private Firms in China: Matching Firm Approach

This figure plots the average ROA and ROE of listed firms and matched non-listed (private) firms in China. For each year, we select the matching firms from the same industry as the listed firms with the closest book assets. We take simple average of the ROA and ROE of the listed firms and their matching firms to make the plot. 1573 listed firms are matched with one non-listed firm each. We require the book assets of the matching firm is within the [80%, 120%] range of the book assets of the listed firm. We exclude newly listed firms in each year.



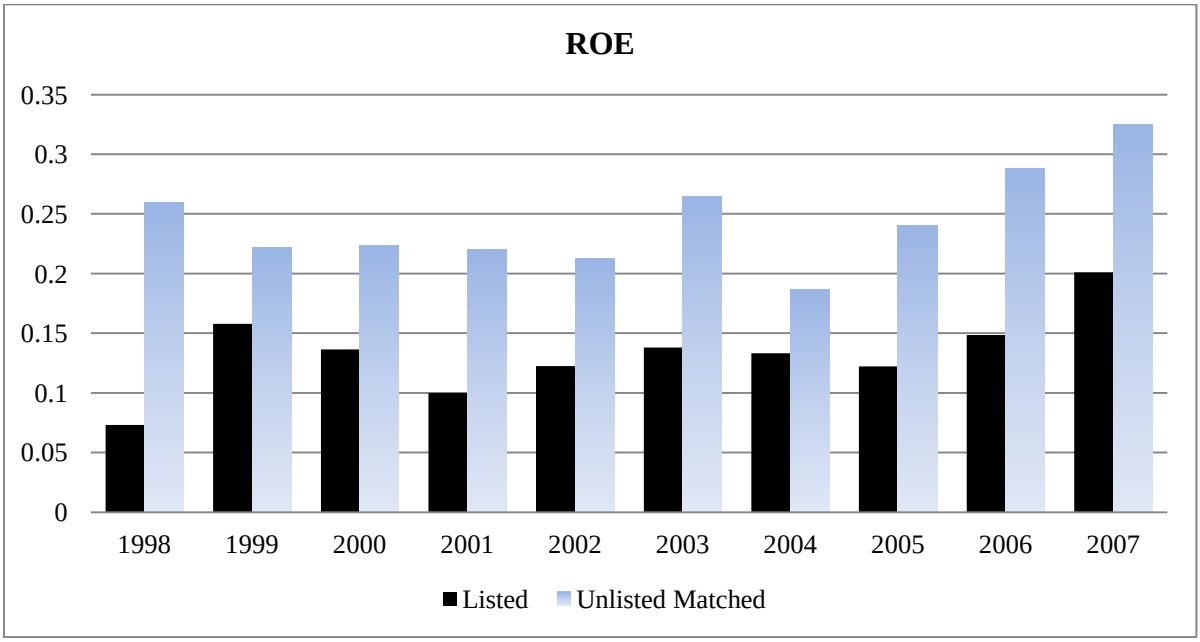
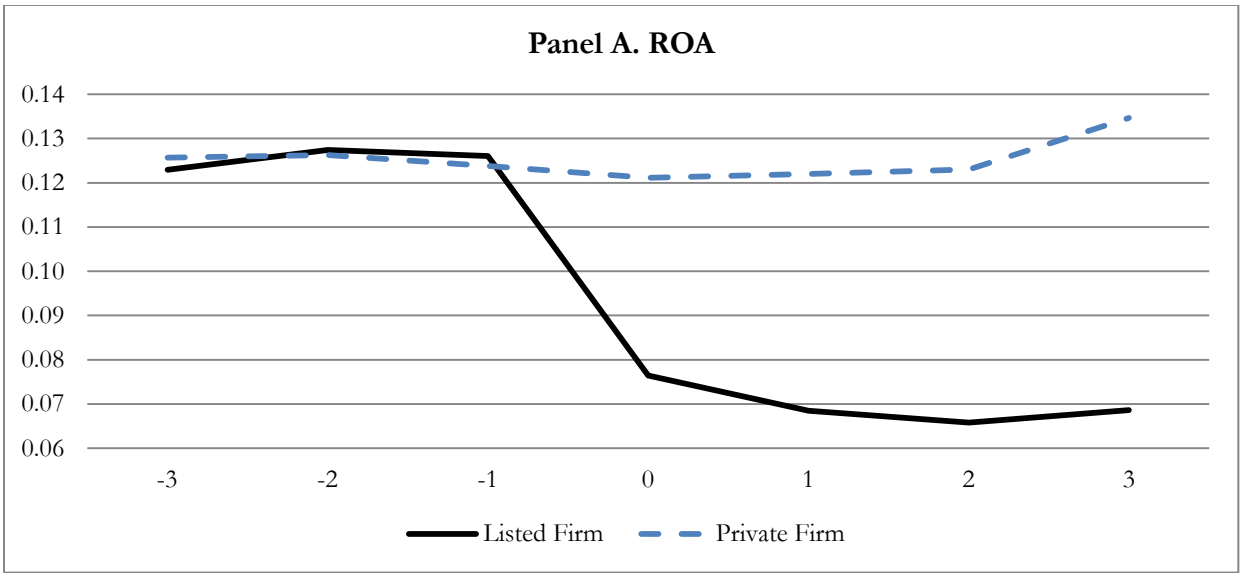


Figure 7. Operating Performance of Listed Firms in China around IPO: Marching Firm Approach

This figure plots the average operating performance of listed firms in China around their IPO year and the performance of their matched private firms. Matching firms are selected from the same industry as the listed firms with closest book assets prior to IPO. Data on private firms are from the Annual Survey of Industrial Firms (ASIF) of NBS. The ASIF dataset covers 7 industries in datasteam based on level-2 industry classification. (Firms from 3 industries, Financial, Consumer Services, and Utilities, are not matched so missing from the plots.) We require the listed firms (treatment) and their one-to-one matching firm that never get listed have non-missing data on book assets, book equity and EBIT from one year before IPO until three years after IPO. ROA and ROE are averaged across firms by year window. Among the 1,693 China listed firms with non-missing data in year -1, 594 are finally matched with one private firm each from the same industry with closest book assets in year -1. (156 firms are from the 3 missing-industries.) 585 of the 594 matched listed firms have non-missing data in the window [-1, +3]. 406 matching (private) firms non-missing data in [-1, +3] and enter the plot. (Different listed firms can be matched to the same private firm; therefore, the group of 406 matching firms may contain duplicated firms. There are 324 unique matching firms with non-missing data in year -1; 184 of them are non-missing data in year +3. Thus 184 unique matching firms enter the plot.) ROA and ROE are winsorized at the 5% and 95% level. Listed and private firms are separately winsorized.



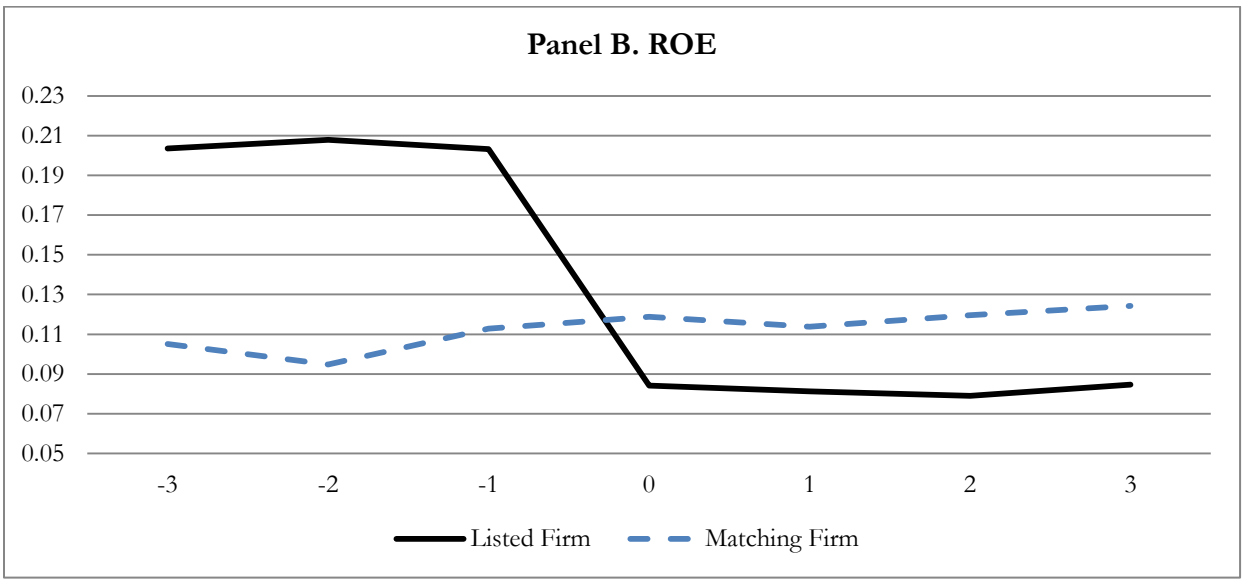
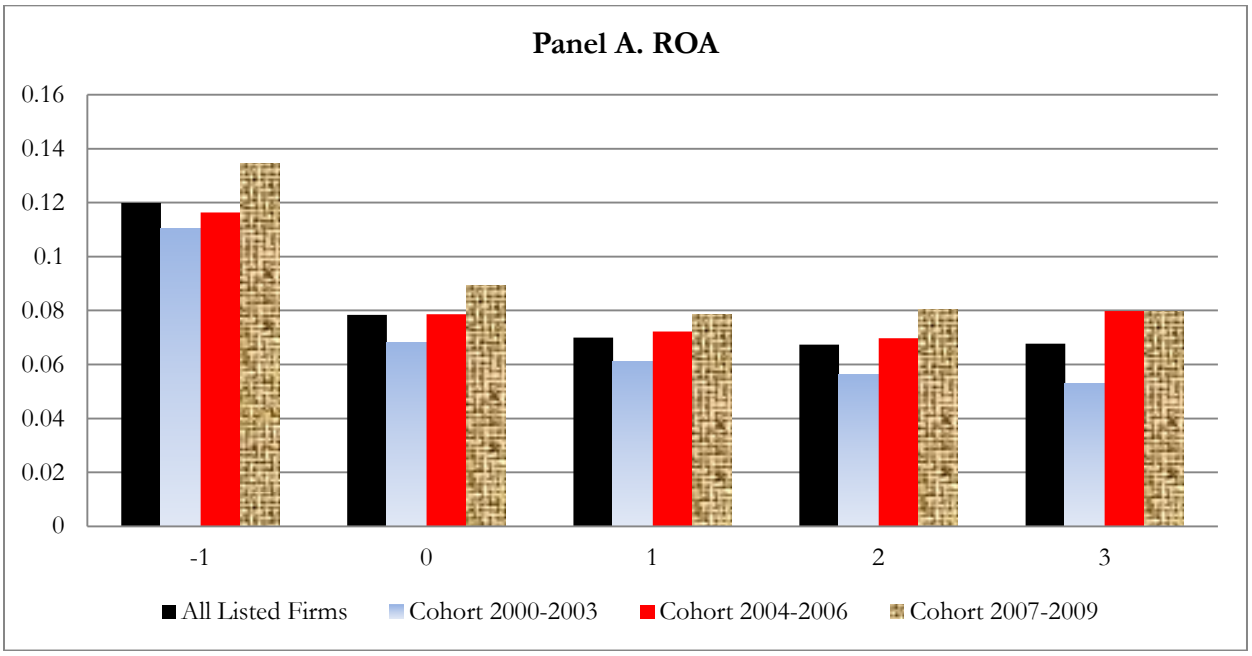


Figure 8. Operating Performance of Listed Firms in China around IPO: Cohort Analysis

We plot the performance of listed firms in China by grouping firms into different cohorts by their IPO year. The black bars represents all listed firms that have non-missing financial information from year -1 to year +3 around the IPO year. The blue bars represent the cohort 2000-2003, representing firms that are listed during 2000-2003. Corhot 2004-2006 and cohort 2007-2009 are represented by the red bars and the textured brown bars. ROA and ROE are averaged across firms within each group.



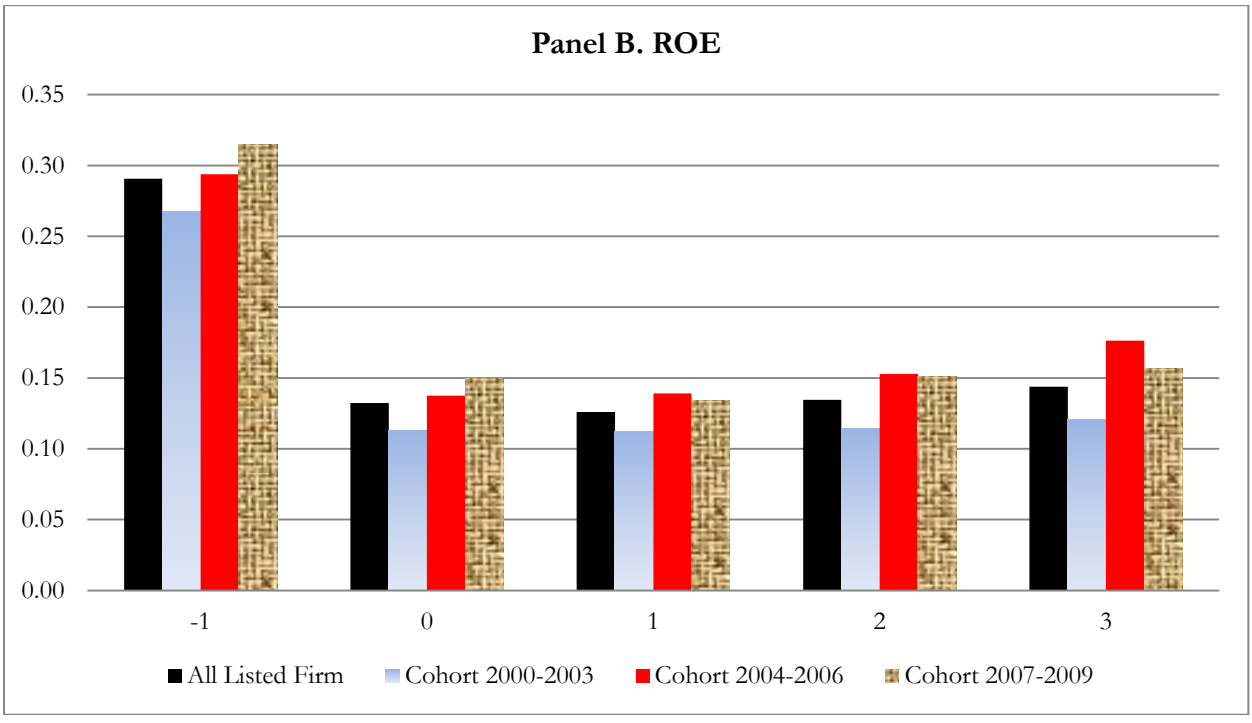
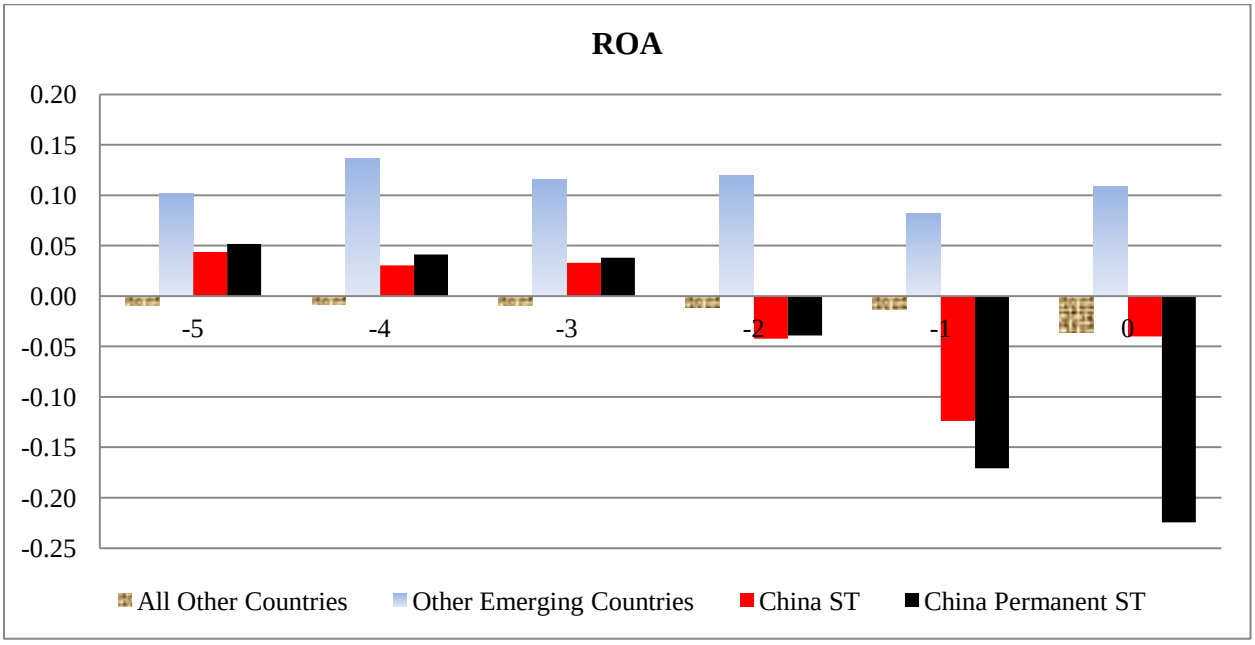


Figure 9. Operating Performance before Delisting/Special Treatment (ST)

This figure plots the earnings and stock returns of firms in the [-5, 0] year windows before their delisting or receiving an "ST" for listed firms in China. We plot both the average of all ST firms and all permanent ST firms. The former refers to firms that ever received "special treatment"; the latter refers to firms that received "special treatment" and never re-emerged from the special treatment later during the sample period. For countries other than China, we use delisted firms to make the plot. We define the year in which the firm has the last stock price available or the firm's stock trading becomes inactive as the delisting year, depending on which date appeared later. For ST stocks in China, we define the year when the firm became "ST" for the first time as year zero. ROA and ROE are averaged across firms by windows prior to the delisting/ST year.



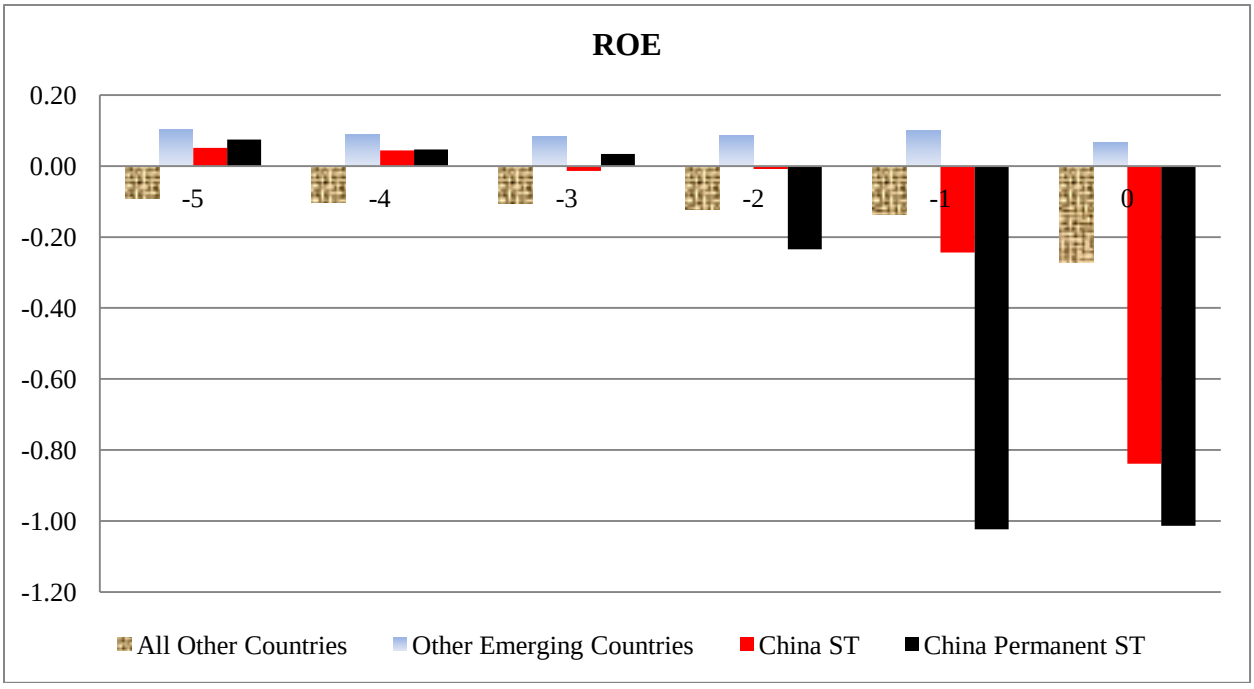


Figure 10. Investment Made by Listed Firms in China and Other Major Countries

This figure plots average investment size made listed firms in China by year. We use the capital expenditure in the year t scaled by the book assets in year t-1 to measure investment size. The scaled capital expenditure is averaged across firms with the book assets as the weight. Firms with missing data for capital expenditure and book assets are excluded from the sample.

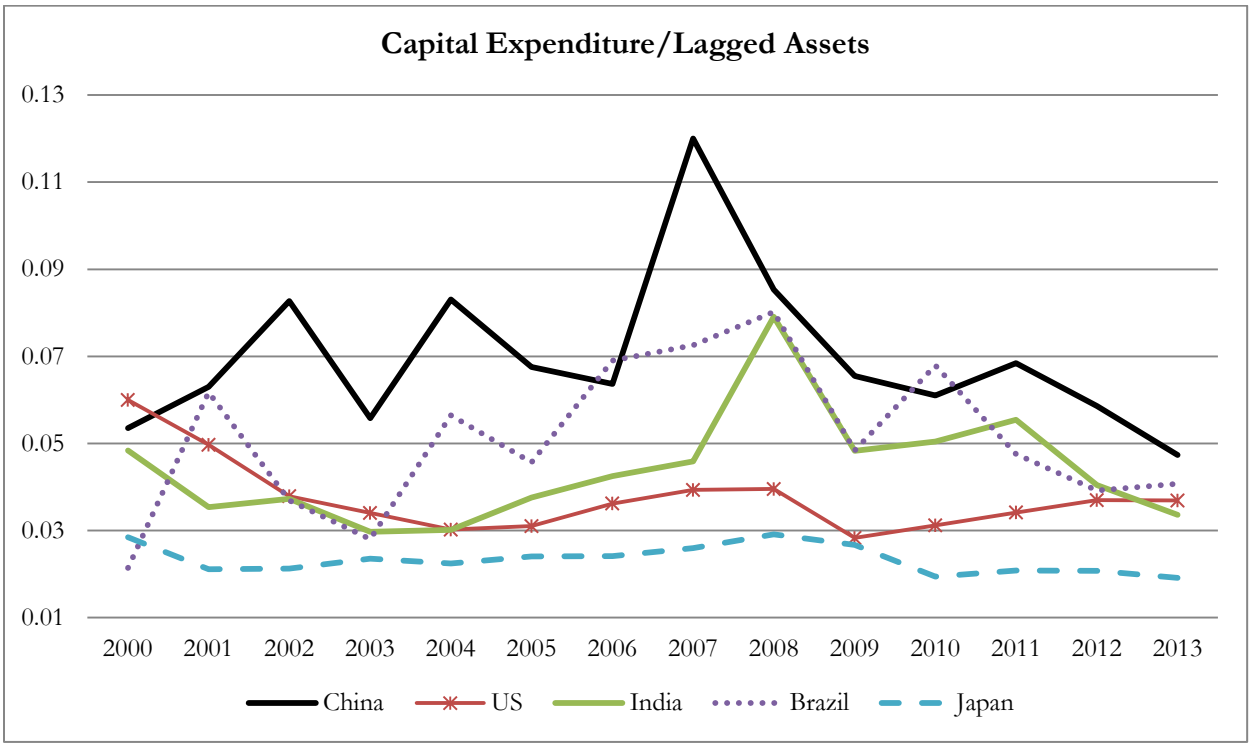
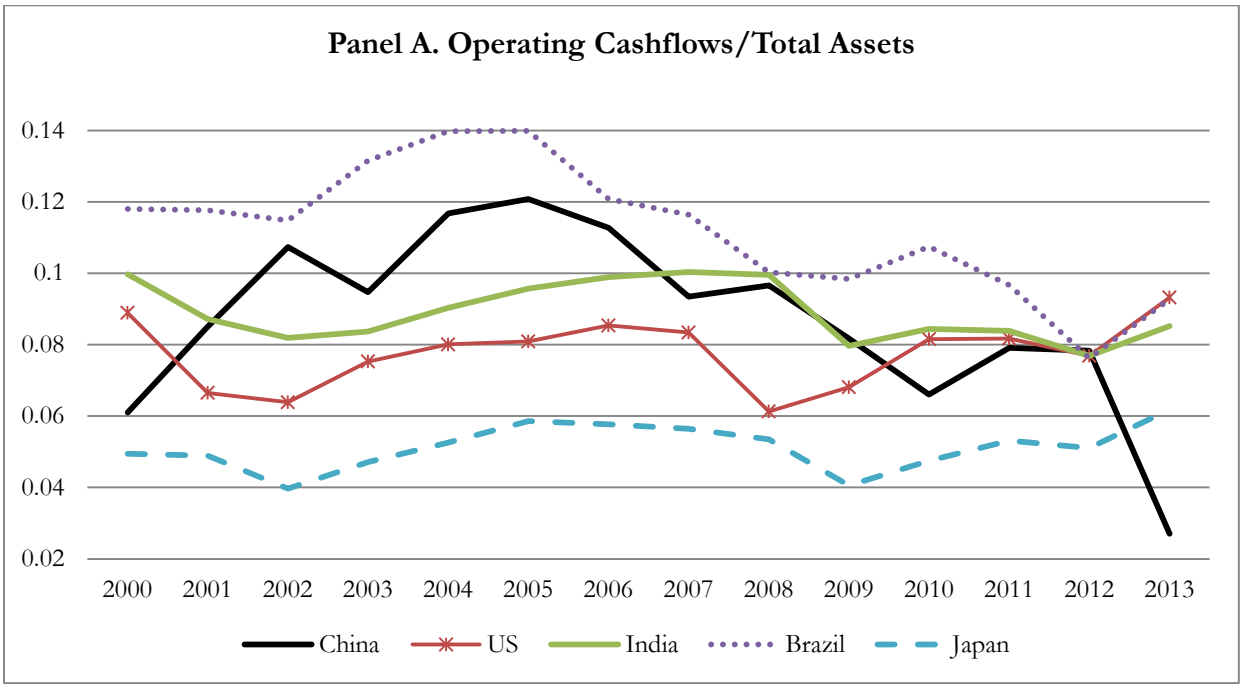


Figure 11. Comparison of Cashflows of Listed Firms in China and Other Major Countries

This figure plots the cashflows of listed firms in China and other major countries. Operating cashflow is calculated as EBITDA – Income Taxes. Net cashflow is calculated as EBITDA - Change in Working Capital – Capital Expenditure – Income Taxes. The cashflow measures are averaged across firms with the book assets as the weight. The sample is restricted to firms that have non-missing data on EBIT, capital expenditure, working capital, income taxes and book assets.



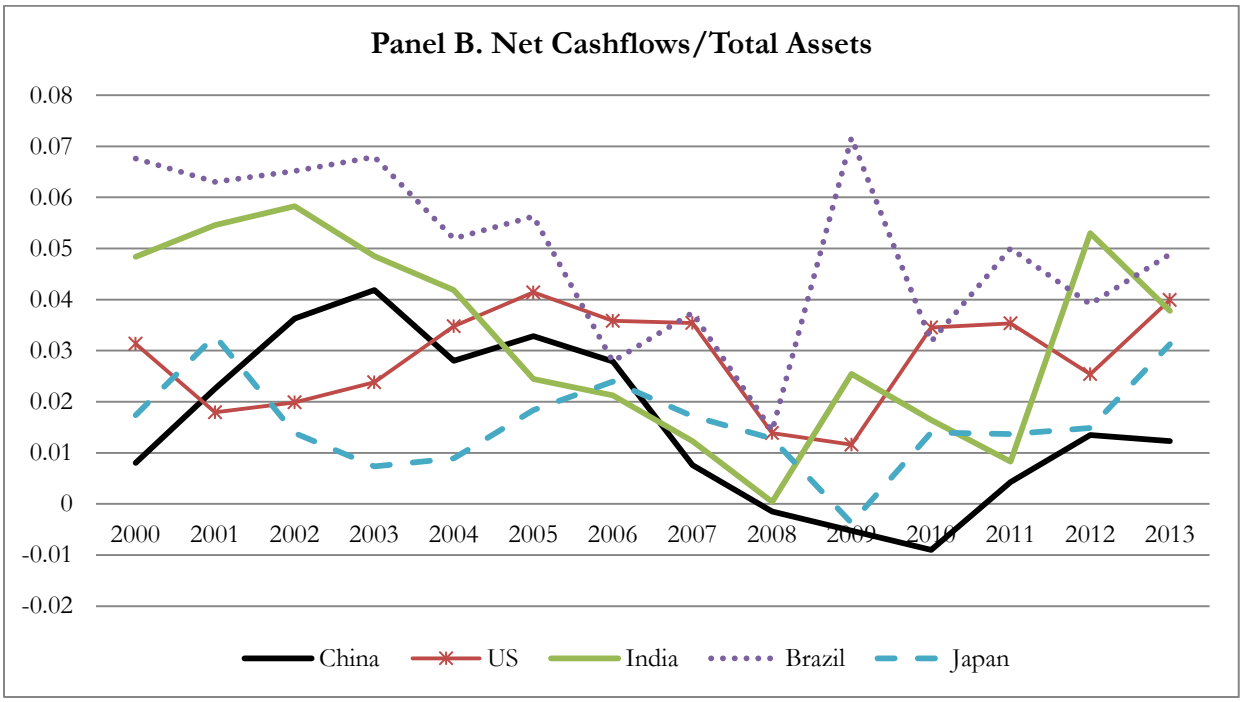


Figure 12. Sharpe Ratio and Risk: Cross-Country Comparison

This figure plots the average Sharpe Ratio and the standard deviation of stock returns of firms listed in China, US and other major countries. The Sharpe Ratio is calculated as the ratio of annualized excess return over the annualized stock return volatility with monthly stock return data from Bloomberg. The annual stock returns are calculated as the monthly returns multiplied by 12. We use zero as the risk-free rate to calculate the excess return. The annual stock return volatilities are calculated as the monthly standard deviations of stock returns multiplied by 12.

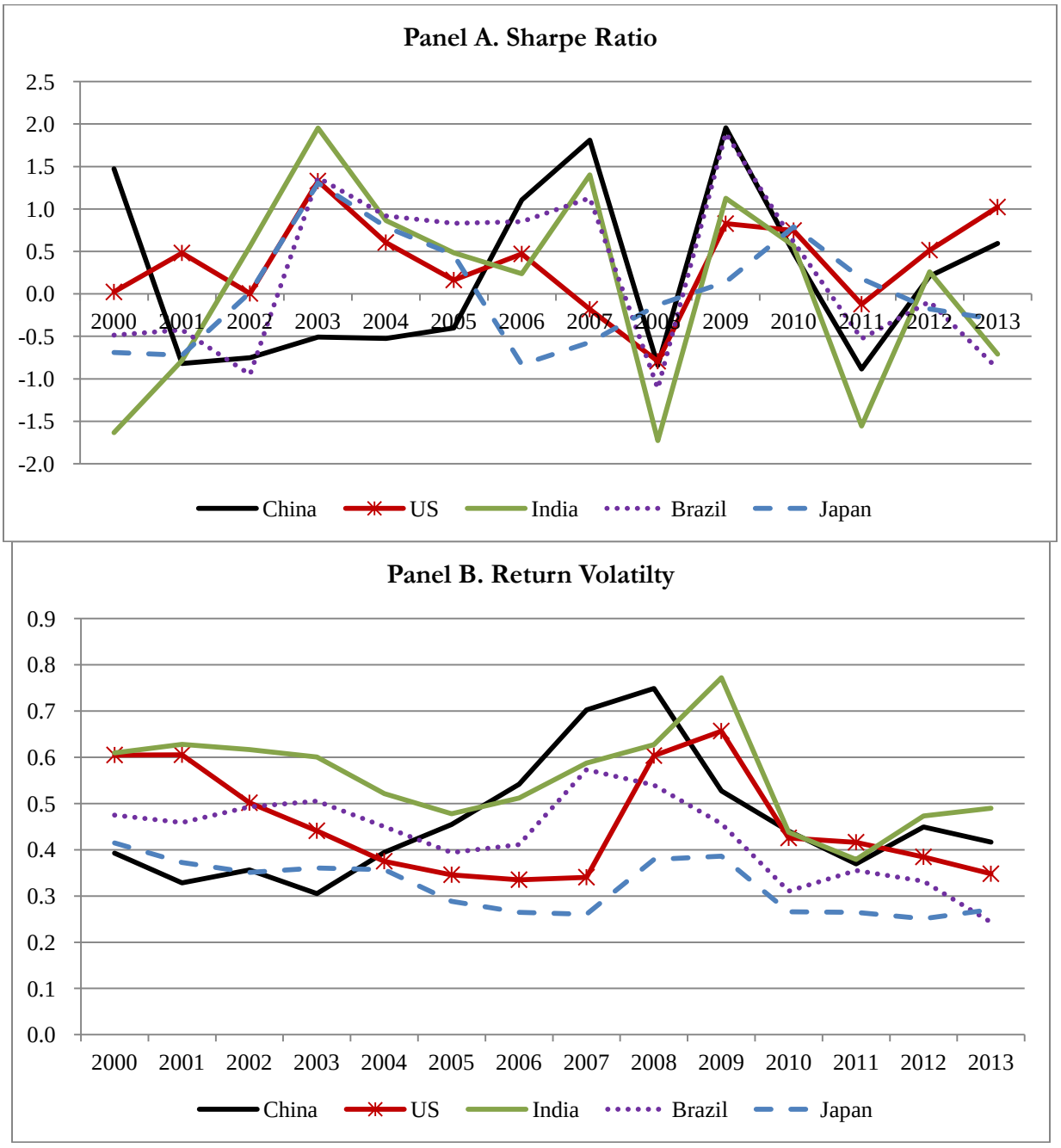
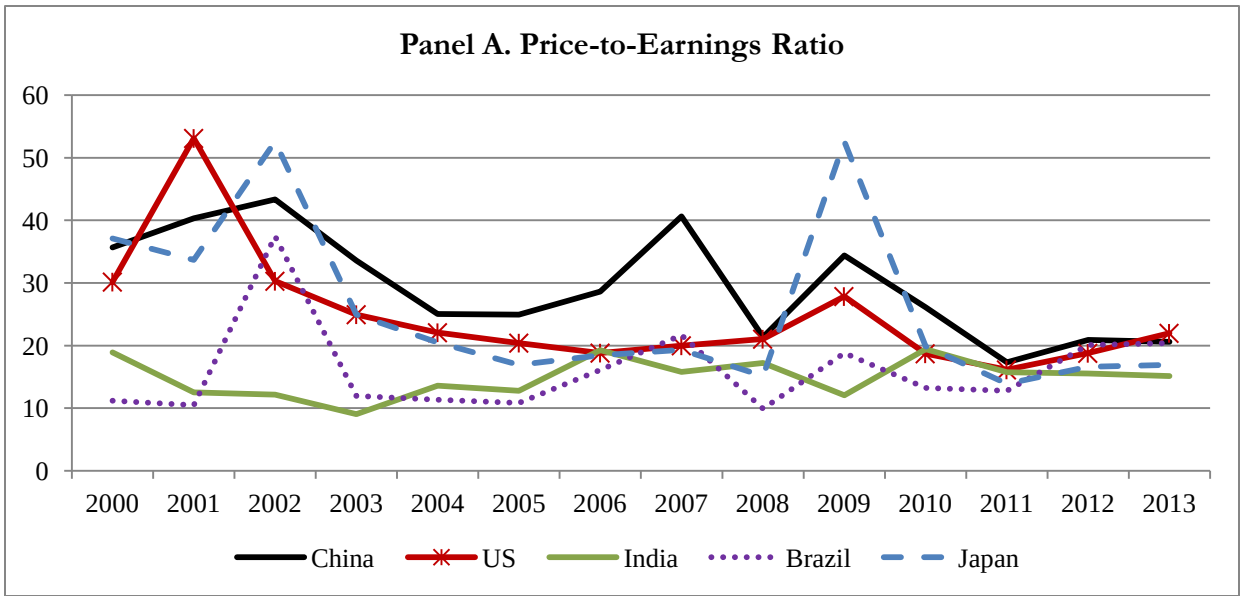


Figure 13. Valuation of Listed Firms

This figure plots the average valuation of all listed firms in China and other major countries, measured by the price-to-earnings (P/E) ratio (left y-axis) and the market-to-book ratio (right y-axis) in Panel A and Panel B, respectively. To ensure consistency of the calculation of the valuation measures, we use both the market value and earnings measure at the security level. We obtain the earnings for security ***j*** issued by firm ***i*** by multiply the firm-level earnings by the ratio $\frac{\text{Market Cap of Security}_j}{\text{Market Cap of Firm}_i}$. The book equity used for the calculation of the market-to-book ratio is calculated in the same way. We calculate the P/E ratio by aggregating the security-level market capitalization across all firms and dividing it by the aggregated security-level net income. We calculate the market-to-book ratio by aggregating the security-level market capitalization across all firms and divide it by the aggregated security-level book equity.



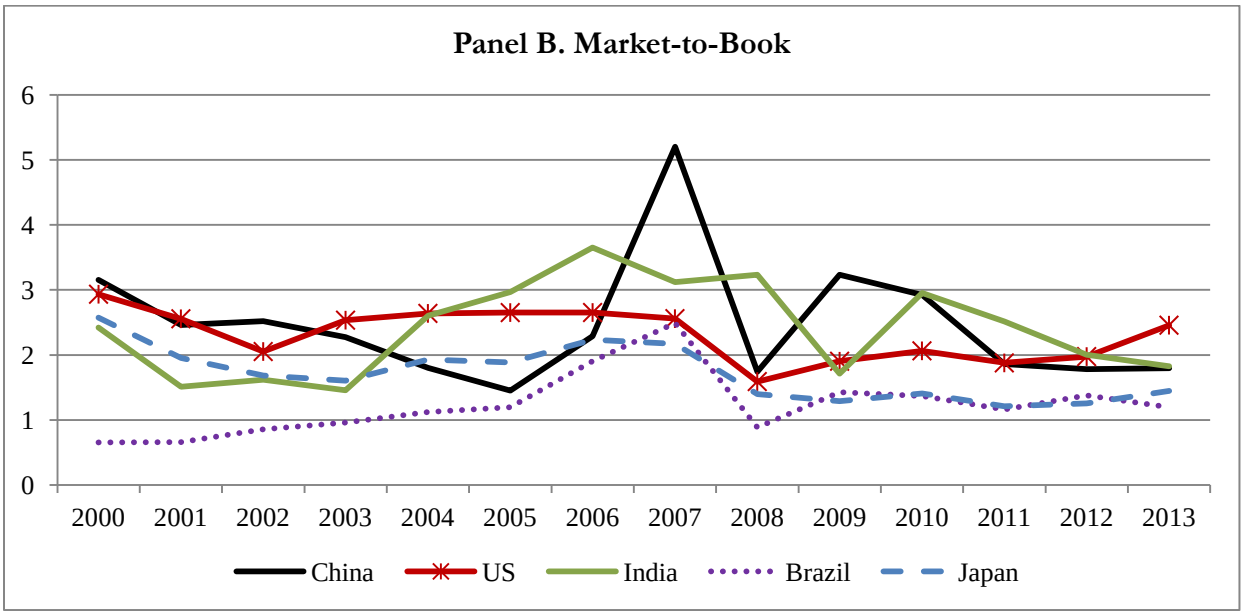


Table I
Distribution of the Sample by Year

This table presents the summary statistics of firm and country characteristics by year Panel A presents summary statistics of firms listed in all countries. Panel B presents summary statistics of firms listed in China. The sample is restricted to firms that have non-missing stock price, total assets, net income, shareholder equity, sales and dividend data. The buy-and-hold returns are calculated as the weighted buy-and-hold returns including dividend, with the market-capitalization in the same year as the weight. Price-to-Earnings ratio is calculated by summarizing all firms' market capitalization and dividing it by the sum of the firms' book equity. Market-to-book ratio is the sum of firms' market capitalization divided by the firms' total book assets. ROA is the sum of firms' net income divided by the sum of firms' total assets. ROE is the sum of firms' net income to shareholders divided by the sum of firms' shareholder equity. Stock prices and firm financial data are extracted on annual basis from Worldscope.

Summary of Listed Firms in China							
Year	Number of Listed Stocks	Total Assets ($ Billion)	Value-weighted BHR (excluding dividends)	Value-weighted BHR (including dividends)	Sharpe Ratio	Price-to-Earnings	Market-to-Book
2000	1389	0.21	1.00	1.00	1.14	30.04	3.17
2001	1410	0.26	0.81	0.81	-0.71	40.03	2.51
2002	1591	0.31	0.66	0.66	-0.66	42.99	2.56
2003	1716	0.36	0.62	0.62	0.05	36.79	2.23
2004	1769	0.41	0.49	0.49	-0.53	25.97	1.78
2005	1770	0.47	0.41	0.41	-0.31	25.98	1.37
2006	1814	0.57	0.67	0.67	1.25	27.45	2.16
2007	2067	0.77	1.51	1.52	1.81	40.05	4.90
2008	2333	0.86	0.50	0.51	-1.19	22.89	1.75
2009	2617	1.02	0.98	0.99	1.58	34.49	3.58
2010	2739	1.23	0.88	0.88	-0.19	25.01	3.30
2011	2791	1.45	0.62	0.62	-0.72	17.98	1.99
2012	2779	1.60	0.61	0.62	0.17	20.09	1.97
2013	2994	1.77	0.60	0.61	0.58	21.05	1.92

Table II

Deposit Interest Rates, Government Bond Yield and Stock Returns

This table shows the deposit rate, government bond yield and stock returns in both nominal and real terms in China from 2000 to 2013. Because the deposit rates are changing over time, we take the deposit rate at the end of the year. Government bond yield is the average yield of multiple bonds issued by the government within a year. Stock prices are extracted at the end of the year. The real returns are adjusted for inflation by subtracting the contemporaneous CPI rate from the nominal returns. The deposit rate and government bond yield data are from the website of the Peoples' Bank of China (PBOC). The stock returns data are from Datastream. The CPI data are from the website of World Bank.

Panel A. Nominal Rate

Year	Demand Deposit (%)	1-year Deposit (%)	5-year Deposit (%)	3-year Government Bond (%)	5-year Government Bond (%)	Value-weighted Stock Returns (%)
2000	0.99	2.25	2.88	2.89	3.14	59.46
2001	0.99	2.25	2.88	2.89	3.14	-22.1
2002	0.72	1.98	2.79	2.21	2.47	-16.61
2003	0.72	1.98	2.79	2.24	2.54	-4.02
2004	0.72	2.25	3.60	2.59	2.92	-17.09
2005	0.72	2.25	3.60	3.32	3.73	-12.89
2006	0.72	2.52	4.14	3.24	3.57	65.26
2007	0.72	4.14	5.85	4.28	4.82	107.55
2008	0.36	2.25	3.60	6.61	6.22	-62.63
2009	0.36	2.25	3.60	3.73	4.00	81.6
2010	0.36	2.75	4.55	3.73	4.00	2.9
2011	0.50	3.50	5.50	5.40	5.97	-18.34
2012	0.35	3.00	4.75	5.59	6.15	5.61
2013	0.35	3.00	4.75	5.58	6.15	0.93

Panel B. Real Rate

Year	Demand Deposit (%)	1-year Deposit (%)	5-year Deposit (%)	3-year Government Bond (%)	5-year Government Bond (%)	Value-weighted Stock Returns (%)
2000	-0.51	0.75	1.38	1.39	1.64	57.11
2001	1.29	2.55	3.18	3.19	3.44	-21.87
2002	1.12	2.38	3.19	2.61	2.87	-16.28
2003	-2.47	-1.21	-0.40	-0.96	-0.66	-6.98
2004	-1.70	-0.17	1.18	0.17	0.50	-19.05
2005	-0.84	0.69	2.04	1.76	2.17	-14.23
2006	-2.09	-0.29	1.33	0.43	0.76	60.74
2007	-5.79	-2.37	-0.66	-2.23	-1.69	94.87
2008	-0.84	1.05	2.40	5.41	5.02	-63.08
2009	-1.50	0.39	1.74	1.87	2.14	78.29
2010	-4.23	-1.84	-0.04	-0.86	-0.59	-1.62
2011	-3.57	-0.57	1.43	1.33	1.90	-21.53
2012	-2.15	0.50	2.25	3.09	3.65	3.03
2013	-2.15	0.50	2.25	3.08	3.65	-3.35

Table III
Correlation between Current Stock Return and Future GDP Growth

This table reports the Pearson correlation between stock indices (or aggregated stock returns) in major countries and the GDP growth in the next year. Panels A and B report correlations and their statistical significance during the period 1992 (1996) – 2013 and 2000-2013, respectively. Panel C reports correlations for developed countries in a longer period from 1950. For countries which established a stock market later than 1950, we calculate the correlation from first year when its stock trading started. ***, ** and * denote the statistical significance at 1%, 5% and 10% level.

Panel A. Correlation in 1990s-2013

Country	Index	Sample Period	Pearson Correlation of Stock Return and GDP Growth	P Value of Correlation
China	Shanghai Composite Index	1992-2013	0.344	0.127
United States	S&P500	1992-2013	0.720***	<0.001
India	BSE SENSEX Index	1992-2013	0.143	0.537
Brazil	IBOV	1992-2013	0.593***	0.004
Russian Federation	RTS	1996-2013	0.233	0.367
South Africa	South Africa TOP 40 Index	1996-2013	0.724***	0.001
United Kingdom	FT100	1992-2013	0.553***	0.009
South Korea	KOSPI	1992-2013	0.593***	<0.001
Taiwan	TAIEX	1992-2013	0.693***	<0.001

Panel B. Correlation in 2000-2013

Country	Index	Sample Period	Pearson Correlation of Stock Return and GDP Growth	P Value of Correlation
China	Shanghai Composite Index	2000-2013	0.434	0.139
United States	S&P500	2000-2013	0.631**	0.021
India	BSE SENSEX Index	2000-2013	0.403	0.173
Brazil	IBOV	2000-2013	0.949***	<0.001
Russian Federation	RTS	2000-2013	0.659**	0.014
South Africa	South Africa TOP 40 Index	2000-2013	0.785***	0.002
United Kingdom	FT100	2000-2013	0.466	0.109
Japan	Nikkei225	2000-2013	0.687***	0.009
South Korea	KOSPI	2000-2013	0.593**	0.032
Taiwan	TAIEX	2000-2013	0.918***	<0.001

Panel C. Correlation in Longer Period

Country	Index	Sample Period	Pearson Correlation of Stock Return And GDP Growth	P Value of Correlation
United States	Value-weighted Returns	1950-2013	0.567***	<0.001
United Kingdom	FT30	1957-2013	0.461***	<0.001
Japan	Nikkei225	1972-2013	0.463***	0.002
South Korea	KOSPI	1982-2013	0.465***	0.007
Taiwan	TAIEX	1982-2013	0.439***	0.012

Table IV
Revenue and Net Income Growth by Sector

This table summarizes the aggregated revenue and net income generated by industrial firms in China. We group firms into state-owned, non-state-owned, listed and unlisted. Within the state-owned group, we further distinguish those publicly listed in stock market. Within the unlisted group, we further distinguish those that are state-owned and non-state-owned. Industrial firms cover the following industries: Oil&Gas, Basic Materials, Industrials, Consumer Goods, Consumer Services, Healthcare, and Utilities. Panel A1 reports the percentage of revenue of firms in each group. Panel A2 reports the revenue growth rate of each group. The bottom row reports the Pearson correlation between the revenue growth rate of each group of firms and the GDP growth rate. Panel B1 reports the percentage of net income of firms in each group. Panel B2 reports the net income growth rate of each group. The bottom row reports the Pearson correlation between the net income growth of firms in each group and the GDP growth rate. We extract the aggregate data for all industrial firms and all SOE from the statistical yearbook of NBS. The firm-year data for listed firms are extracted from WIND. We distinguish listed SOE based on the ultimate controller information provided by CSMAR. Firms which are ultimately controlled by central SASAC, local SASAC, Ministry of Finance or other government agencies are defined as SOE. ***, ** and * denote statistical significance at 1%, 5% and 10% level, respectively.

Panel A1. Revenue Percentage

Year	SOE/All	Listed/All	Listed SOE /Listed All	Unlisted Non-SOE /Unlisted All
2000	50.15%	12.29%	79.08%	50.21%
2001	47.41%	16.02%	83.03%	53.17%
2002	43.70%	16.37%	83.22%	56.96%
2003	40.53%	16.84%	77.34%	60.10%
2004	35.91%	16.56%	78.42%	64.80%
2005	34.43%	16.01%	80.59%	66.32%
2006	32.34%	15.72%	84.22%	68.49%
2007	30.68%	19.56%	86.81%	70.44%
2008	29.50%	18.84%	84.46%	71.56%
2009	27.96%	18.76%	84.30%	73.12%
2010	27.85%	20.76%	85.65%	73.37%
2011	27.19%	22.30%	82.57%	74.07%
2012	NA	21.80%	79.77%	NA

Panel A2. Revenue Growth

Year	All	SOE	Non-SOE	Listed	Unlisted	Listed SOE	Listed Non-SOE	Unlisted Non-SOE
2001	0.114	0.053	0.175	0.452	0.110	0.525	0.178	0.175
2002	0.168	0.077	0.251	0.193	0.168	0.196	0.180	0.251
2003	0.308	0.213	0.381	0.345	0.307	0.250	0.816	0.379
2004	0.389	0.231	0.497	0.366	0.390	0.385	0.302	0.498
2005	0.250	0.198	0.278	0.208	0.250	0.242	0.086	0.279
2006	0.262	0.185	0.302	0.239	0.262	0.295	0.007	0.303
2007	0.275	0.209	0.306	0.586	0.270	0.635	0.326	0.306
2008	0.251	0.203	0.272	0.205	0.252	0.172	0.419	0.272
2009	0.085	0.028	0.109	0.080	0.085	0.078	0.092	0.109
2010	0.286	0.281	0.288	0.423	0.283	0.446	0.301	0.288
2011	0.207	0.178	0.218	0.296	0.205	0.249	0.573	0.216
2012	0.104	NA	NA	0.079	0.104	0.043	0.253	NA
Average	0.225	0.169	0.280	0.289	0.224	0.293	0.294	0.280
Correlation	0.554*	0.492	0.328	0.509*	0.546*	0.554*	-0.127	0.331
P-Value	0.062	0.125	0.325	0.090	0.066	0.061	0.694	0.320

Panel B1. Net Income Percentage				
Year	SOE/All	Listed/All	Listed SOE/Listed All	Unlisted Non-SOE/Unlisted All
2000	42.51%	55.42%	89.23%	65.68%
2001	35.80%	41.69%	86.44%	63.53%
2002	30.60%	41.84%	75.36%	66.73%
2003	35.72%	43.50%	73.57%	67.44%
2004	37.92%	41.65%	76.19%	68.97%
2005	37.25%	37.12%	76.36%	69.54%
2006	37.27%	33.78%	73.91%	67.91%
2007	33.74%	32.87%	70.96%	71.84%
2008	21.34%	19.54%	70.26%	77.81%
2009	12.09%	26.06%	64.64%	82.13%
2010	16.05%	25.25%	63.34%	81.07%
2011	15.20%	21.39%	64.91%	80.99%
2012	NA	19.53%	63.28%	NA

Panel B2. Net Income Growth								
Year	All	SOE	Non-SOE	Listed	Non-listed	Listed SOE	Listed Non-SOE	Non-listed Non-SOE
2001	0.077	-0.008	0.181	-0.192	0.238	-0.217	0.018	0.197
2002	0.222	0.102	0.344	0.270	0.203	0.107	1.307	0.264
2003	0.441	0.457	0.428	0.625	0.366	0.586	0.743	0.381
2004	0.431	0.421	0.439	0.418	0.437	0.468	0.278	0.470
2005	0.241	0.196	0.279	0.130	0.294	0.132	0.122	0.305
2006	0.318	0.302	0.330	0.215	0.361	0.176	0.341	0.329
2007	0.392	0.272	0.485	0.382	0.396	0.327	0.538	0.477
2008	0.125	-0.160	0.314	-0.355	0.304	-0.361	-0.339	0.412
2009	0.130	0.025	0.175	0.403	0.080	0.291	0.668	0.140
2010	0.536	0.587	0.517	0.588	0.523	0.556	0.646	0.504
2011	0.157	0.117	0.173	-0.014	0.200	0.010	-0.056	0.199
2012	0.008	NA	NA	-0.111	0.033	-0.134	-0.070	NA
Average	0.257	0.210	0.333	0.197	0.286	0.162	0.350	0.334
Correlation	0.597**	0.388	0.531*	0.390	0.610**	0.410	0.170	0.531*
P-Value	0.040	0.239	0.093	0.210	0.035	0.186	0.597	0.093

Table V
The Prediction Model of Buy-and-Hold Returns

This table examines the stock performance of listed firms in China relative to listed firms in other countries. The dependent variables are buy-and-hold returns calculated from annual returns and annualized Sharpe Ratios in Panel A and B, respectively. In columns 1 to 4, firms listed in mainland China are excluded from the sample. In columns 5 and 6, China is included. We use stock prices in local currency adjusted for inflation in the listing country to calculate BHR. We use stock returns in USD and the US 3-month treasury rate as the risk-free rate to calculate the Sharpe Ratios. The buy-and-hold returns are calculated with the stock price in 2000 as the base price, and averaged at country-level with the market capitalization in the previous year as the weight. The annual Sharpe Ratio is calculated as the excess annual returns divided by the annualized stock return volatilities. The annual returns and annual volatilities are calculated as monthly returns and monthly volatilities multiplied by 12. In the BHR regressions, we control for the stock return volatilities during the holding period. In the Sharpe Ratio regressions, we control for the current-year stock return volatilities. We allow firms that have non-missing stock return and financial information to enter the regressions. We exclude firms listed in exchanges that have fewer than 20 stocks in any given year from the sample. The final sample is composed of firms listed in 45 countries. We use alternative sample period 1991-2013 and 2000 to 2013. We control for year, exchange and Datastream level-2 industry fixed effects. T-values calculated using the standard errors clustered by country are reported in the parentheses. ***, ** and * denote the statistical significance at 1%, 5% and 10% level.

Panel A. The Prediction Model of BHR

	1991-2013		2000-2013		2000-2013	
Variable	Model1	Model2	Model3	Model4	Model5	Model6
China					-3.800***	-2.872***
					(-3.262)	(-6.574)
Log (Total Assets)	0.112***	0.134***	0.002	0.002**	0.060**	0.057**
	(3.632)	(3.490)	(1.508)	(2.112)	(2.346)	(2.155)
Leverage	-0.593***	-0.616***	-0.017**	-0.016**	-0.176	-0.293***
	(-3.448)	(-3.359)	(-2.289)	(-2.015)	(-0.870)	(-2.651)
ROA	0.926***	0.853**	0.056***	0.056***	0.564**	0.580***
	(2.638)	(2.478)	(6.953)	(6.919)	(2.398)	(2.565)
ROE	0.001	0.002	0.000***	0.000***	0.319***	0.338***
	(0.873)	(1.408)	(4.353)	(4.736)	(3.449)	(3.338)
EBIT Growth	0.070***	0.074***	0.003***	0.002***	0.001	0.001
	(5.149)	(5.000)	(4.283)	(3.534)	(-0.862)	(-0.419)
Sales Growth	0.001	0.001	0.001	0.001	0.067***	0.065***
	(0.346)	(1.205)	(0.327)	(0.699)	(4.482)	(4.332)
Stock Return Volatility during the Holding Period	0.000**	0.105*	1.087***	1.062***	-0.101	-0.043
	(1.988)	(1.698)	(4.006)	(4.158)	(-0.230)	(-0.110)
Consumption Volatility during the Holding Period	10.438**	35.178***	13.291**	26.304***	12.416**	17.498***
	(2.453)	(3.592)	(2.329)	(3.274)	(2.150)	(3.493)
GDP Growth	0.044***	0.027*	-0.003	-0.005*	0.115***	0.097***
	(3.686)	(1.876)	(-1.190)	(-1.651)	(2.778)	(4.061)
GDP Per Capita	0.001	0.001*	-0.001**	-0.001***	8.829	4.121***
	(1.214)	(1.654)	(-1.996)	(-2.767)	(0.915)	(3.947)
EBIT/GDP	0.003***	0.003***	-0.002***	-0.002***	0.003	-0.009***
	(7.803)	(5.825)	(-11.251)	(-11.420)	(0.174)	(-3.775)
Bank Credit/GDP	-0.002	-0.001**	-0.001***	-0.001***	0.008	0.002
	(-1.056)	(-2.121)	(-2.980)	(-3.358)	(1.134)	(1.332)
Number of Listed Firms/Population	0.001	0.003**	0.001	0.001	0.011***	0.011***
	(0.248)	(2.337)	(-0.132)	(1.324)	(4.224)	(3.805)
Turnover Ratio	0.210*	0.015	0.014	0.008	0.002	0.000
	(1.641)	(0.192)	(1.450)	(0.880)	(0.709)	(-0.487)
Population '(Million)	0.002***	0.001***	0.001	0.001	0.693	0.527***
	(3.269)	(5.297)	(0.897)	(-0.070)	(1.598)	(7.626)

Anti-Self-Dealing Index	-0.071	-2.064***	-0.021	-0.086**	1.182	0.338
	(-0.111)	(-3.701)	(-0.513)	(-2.050)	(1.183)	(0.640)
Tax Evasion	0.156*	0.131	0.012**	0.009*	-0.572*	-0.304***
	(1.694)	(1.539)	(2.472)	(1.708)	(-1.872)	(-4.489)
Time to Collect on a Bounced Check	0.177	0.121	-0.002	-0.008	0.281	-0.073
	(1.410)	(1.076)	(-0.309)	(-1.171)	(0.653)	(-0.473)
Earnings Management Score		-0.068***		-0.003***		0.001
		(-6.812)		(-5.633)		(0.165)
Intercept	-2.912**	-1.235	-0.067	0.076	-3.955	-0.593
	(-2.404)	(-0.974)	(-1.127)	(1.113)	(-0.790)	(-0.520)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared '(%)	14.15	18.83	25.21	25.06	14.38	15.98
Observations	506970	486392	506970	486392	417509	404828

Panel B. The Prediction Model of Sharpe Ratio

	1991-2013		2000-2013		2000-2013	
Variable	Model1	Model2	Model3	Model4	Model5	Model6
China					-0.515***	-0.534*
					(-2.837)	(-1.950)
Log (Total Assets)	0.058**	0.056**	0.016**	0.014*	0.018**	0.017**
	(2.261)	(2.066)	(2.057)	(1.817)	(2.210)	(1.998)
Leverage	-0.170	-0.290***	-0.146***	-0.152***	-0.151***	-0.153***
	(-0.834)	(-2.620)	(-4.713)	(-4.683)	(-4.678)	(-4.665)
ROA	0.559**	0.575***	0.515***	0.515***	0.522***	0.527***
	(2.390)	(2.551)	(7.080)	(7.218)	(6.974)	(6.928)
ROE	0.313***	0.332***	0.206***	0.207***	0.210***	0.212***
	(3.435)	(3.322)	(9.757)	(9.330)	(8.989)	(8.525)
EBIT Growth	0.065***	0.062***	0.060***	0.059***	-0.001***	-0.001***
	(4.356)	(4.223)	(9.399)	(9.150)	(-4.814)	(-4.386)
Sales Growth	0.001	0.001	-0.001***	-0.001***	0.061***	0.060***
	(-0.853)	(-0.395)	(-4.664)	(-4.237)	(9.361)	(9.140)
GDP Growth	0.118***	0.098***	0.037***	0.041**	0.053***	0.061***
	(2.687)	(3.756)	(2.757)	(2.507)	(2.755)	(2.536)
GDP Per Capita	8.830	4.156***	0.005	-0.027	-0.033	-0.481
	(0.914)	(3.915)	(0.112)	(-0.045)	(-0.531)	(-0.615)
EBIT/GDP	0.003	-0.008***	-0.001	-0.001	-0.002	-0.003
	(0.198)	(-3.413)	(-0.667)	(-0.651)	(-1.008)	(-0.987)
Bank Credit/GDP	0.008	0.002	0.001	0.001	0.001	0.000
	(1.136)	(1.335)	(0.803)	(1.005)	(0.943)	(0.829)
Number of Listed Firms/Population	0.011***	0.011***	-0.002*	-0.002*	-0.003**	-0.003*
	(4.154)	(3.699)	(-1.953)	(-1.665)	(-2.163)	(-1.892)
Turnover Ratio	0.002	-0.001	0.001**	0.001*	0.002**	0.002**
	(0.652)	(-0.724)	(2.101)	(1.871)	(2.310)	(2.133)
Population '(Million)	0.693	0.532***	-0.064*	-0.069	-0.077**	-0.101
	(1.600)	(7.534)	(-1.736)	(-1.250)	(-1.980)	(-1.587)
Anti-Self-Dealing Index	1.179	0.317	0.118	0.081	0.053	0.004
	(1.163)	(0.595)	(0.444)	(0.259)	(0.200)	(0.013)
Tax Evasion	-0.572*	-0.302***	-0.006	-0.009	0.003	0.006
	(-1.843)	(-4.351)	(-0.191)	(-0.375)	(0.086)	(0.201)
Time to Collect on a Bounced Check	0.281	-0.078	0.091	0.110	0.103*	0.113
	(0.652)	(-0.503)	(1.568)	(1.555)	(1.737)	(1.621)
Earnings Management Score		0.001		-0.001		0.001
		(0.088)		(-0.183)		(-0.019)

Intercept	-3.947	-0.565	-0.566*	-0.541	-0.660*	-0.495
	(-0.790)	(-0.502)	(-1.738)	(-1.113)	(-1.867)	(-0.969)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared '(%)	22.79	22.81	15.95	15.98	22.94	22.97
Observations	384698	365748	384698	365748	417509	404828

Table VI

Operating Performance of Chinese Listed Firms: Cross-Country Evidence

This table presents multivariate regression results for changes in ROA, ROE, ROS and sales for the time period t-2 to t+3 for all listed firms. For ROA, ROE and ROS we calculated the absolute changes. For sales we calculate the percentage changes. Year t represents the IPO year. The regression is conducted on a panel of firm-year from 54 countries over the period 2000 to 2012. The independent variable of interest is the China dummy. Other explanatory variables are constructed by firm-year and lagged one year in the regressions. We also control for the country-level IPO proceeds (*average proceeds*) and the difference between the actual number of shares sold and expected number of shares sold (*average allotment*). IPO proceeds and allotment are averaged across firms within each country. We control for country and year fixed effects in all specifications. T-values calculated using the standard errors clustered by country are reported in the parentheses. ***, ** and * denote the statistical significance at 1%, 5% and 10% level.

	Δ ROA		Δ ROE		Δ ROS	
	Δ [-1, +1]	Δ[-2, +2]	Δ [-1, +1]	Δ [-2, +2]	Δ [-1, +1]	Δ[-2, +2]
Variable	Model1	Model2	Model4	Model3	Model5	Model6
China	-0.030***	-0.035***	-0.022**	-0.009	-0.005	-0.015
	(-4.885)	(-4.081)	(-2.114)	(-0.641)	(-0.264)	(-0.495)
ROA	-0.244***	-0.339***				
	(-14.006)	(-18.327)				
ROE			-0.564***	-0.767***		
			(-30.400)	(-29.211)		
ROS					-0.212***	-0.735***
					(-18.252)	(-33.175)
EBIT Growth	-0.006***	-0.005***	-0.006***	-0.006***	-0.009***	-0.011***
	(-5.795)	(-4.759)	(-3.840)	(-3.040)	(-6.307)	(-2.582)
Total Assets	0.001***	0.001***	0.002**	0.001***	0.001	0.001**
	(2.789)	(2.537)	(2.228)	(3.590)	(-0.423)	(2.052)
Leverage	0.057***	0.056***	0.051***	0.072***	0.061***	0.131***
	(23.378)	(14.808)	(3.702)	(4.405)	(7.251)	(12.287)
Average Allotment	0.176**	-0.052	0.228	0.081	0.515**	-0.153
	(2.323)	(-0.457)	(0.993)	(0.390)	(2.140)	(-0.291)
Average Proceeds	-0.003	0.005***	0.004	0.001	-0.004	-0.005
	(-1.410)	(3.680)	(0.699)	(0.220)	(-0.833)	(-0.606)
GDP Growth	0.000	0.003*	-0.003	0.002	-0.001	0.014**
	(-0.333)	(1.957)	(-0.204)	(1.125)	(-0.398)	(2.517)
GDP Per Capita	-0.001**	0.001	-0.001***	-0.001***	-0.001**	0.001
	(-2.169)	(-0.574)	(-4.858)	(-4.798)	(-2.327)	(-1.054)
Intercept	-0.020*	-0.012	-0.028*	-0.022	0.001	0.034
	(-1.703)	(-1.031)	(-1.761)	(-1.269)	(0.059)	(0.704)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared (%)	17.62	27.51	28.31	36.32	21.97	55.53
Observations	26915	17577	27237	17798	24754	16206

Table VII
Earnings Management of Chinese Firms in IPO

This table compares the earnings management measures for listed firms in China and US around IPO. We construct the earnings management measures following Aharony et al (2000). Total accruals is defined as current assets - cash - [current liabilities - current maturity of long-term debt] - depreciation expense. Operating cash flows is defined as net income minus total accruals. The data for firms in China and US are extracted from WIND and Compustat, respectively. We calculate the changes in the earnings management measures in the IPO year and the 1, 3 and 5 years after IPO. ***, ** and * denote the statistical significance at 1%, 5% and 10% level.

Panel A. IPO Year					
Variable	China	N	US	N	Difference
Δ Accruals/Current Sales	-0.318	99	-0.013	1250	-0.305***
Δ Accounts Receivables/Current Sales	-0.066	885	0.035	1778	-0.100***
Δ Inventory/Current Sales	-0.018	885	0.012	1778	-0.030***
Δ Operating Cash Flow/Current Sales	0.002	180	-0.032	1540	0.034***

Panel B. IPO Year +1					
Variable	China	N	US	N	Difference
Δ Accruals/Current Sales	-0.475	765	-0.036	1591	-0.439***
Δ Accounts Receivables/Current Sales	-0.003	1564	0.021	2125	-0.024***
Δ Inventory/Current Sales	0.050	1564	0.010	2125	0.040***
Δ Operating Cash Flow/Current Sales	0.001	1319	-0.034	1814	0.035***

Panel C. IPO Year +3					
Variable	China	N	US	N	Difference
Δ Accruals/Current Sales	-0.147	1203	-0.022	2027	-0.126***
Δ Accounts Receivables/Current Sales	-0.022	1538	0.017	2553	-0.039***
Δ Inventory/Current Sales	0.035	1538	0.007	2553	0.028***
Δ Operating Cash Flow/Current Sales	0.002	1213	0.011	2219	-0.009**

Panel D. IPO Year +5					
Variable	China	N	US	N	Difference
Δ Accruals/Current Sales	-0.063	1413	-0.011	2058	-0.052***
Δ Accounts Receivables/Current Sales	-0.017	1544	0.015	2383	-0.032***
Δ Inventory/Current Sales	0.024	1544	0.009	2383	0.015***
Δ Operating Cash Flow/Current Sales	0.001	1415	0.004	2157	-0.004

Table VIII

Regressions of Earnings and Cashflows of Listed Firms in China and Other Major Countries

This table reports weighted-least-squares (WLS) estimates of regressions that examine the operating cashflows and net cashflows of listed firms in China and other major countries (including US, India, Brazil and Japan). The dependent variables are operating cashflows and net cashflows scaled by book assets in the same year. The independent variable of interest is the indicator representing whether the firm is listed in mainland China. Panel A reports regression results of the whole sample of listed firms. Panel B and C report the regression results by industry. We use the book assets in the same year as the weight. Specifications in Panel A controls for both the year and industry fixed effects. Panel B controls for year fixed effects. T-values calculated using the standard errors clustered by country are reported in the parentheses. ***, ** and * denote the statistical significance at 1%, 5% and 10% level.

Panel A. All Listed Firms

	Operating Cashflows/Total Assets	Net Cashflows/Total Assets
Variable	(1)	(2)
China	-0.002	-0.006***
	(-0.936)	(-2.775)
Total Assets	-0.010	0.012**
	(-4.640)	(2.419)
ROA	0.562***	0.401***
	(10.679)	(36.262)
Leverage	0.083***	0.054***
	(9.527)	(3.310)
EBIT Growth	-0.001***	-0.001**
	(-2.573)	(-2.506)
Sales Growth	0.027***	0.017
	(3.177)	(0.756)
Intercept	0.034***	-0.003
	(4.372)	(-0.777)
Year Fixed Effects	Yes	Yes
Industry Fixed Effects	Yes	Yes
R-squared (%)	39.73	14.73
Observations	147460	119263

Panel B. Operating Cashflows/Total Assets

Industry	China Coefficient	T-value	R-squared (%)	N
BMATR	0.027***	(3.574)	22.08	12235
CNSMG	-0.010**	(-2.486)	39.85	17959
CNSMS	0.004	(0.513)	27.17	15943
FINAN	-0.052***	(-25.736)	44.52	22998
HLTHC	-0.010***	(-7.380)	45.49	11181
INDUS	-0.022***	(-3.821)	31.87	33264
OILGS	0.000	(0.018)	27.19	6067
TECNO	-0.037***	(-9.581)	35.05	14099
TELCM	0.081***	(4.999)	22.85	2123
UTILS	0.020***	(11.877)	22.04	4103

Panel C. Net Cashflows/Total Assets				
Industry	China Coefficient	T-value	R-squared (%)	N
BMATR	0.022*	(1.904)	12.81	10948
CNSMG	-0.002	(-0.442)	22.55	16135
CNSMS	0.002	(0.475)	16.81	13371
FINAN	-0.057***	(-12.177)	28.81	15575
HLTHC	0.005	(0.578)	28.87	9659
INDUS	-0.013***	(-3.536)	12.14	29790
OILGS	0.032*	(1.806)	12.21	5026
TECNO	-0.001	(-0.316)	14.52	12281
TELCM	0.095***	(11.834)	24.39	1658
UTILS	-0.002	(-0.442)	14.93	3572

Table IX

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

This table reports effects of related party transactions (RPTs) on net cash flows of listed firms in China. Panel A describes the summary statistics of the number of firms that are involved in related-party transactions, and the average size of transactions by year. Panel B summarizes the RPTs by industry. Panel C reports the regression results of firm net cashflows on the amount of RPTs. The independent variables of interest are (1) total amount of outflow in RPTs, and (2) net amount of outflow in RPTs. For each firm, we aggregate the amount of each transaction by year. Then we less the total amount of inflow from the total amount of outflow to obtain the net amount of outflow in each year, and scale it by the total book assets in the prior year. In Panel C, we conduct the regressions for state-owned firms (SOE) and non-state-owned firms (non-SOE) separately. We control for other firm characteristics in the prior year. We control for year and industry fixed effects in all specifications. 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. Panel B reports the relation between related-party transactions and investment of listed firms in China. The dependent variable, investment, is measured by the capital expenditure scaled by the total assets in the prior year. The independent variables of interest are (1) total amount of outflow in RPTs, and (2) net amount of outflow in RPTs. We control for other firm characteristics in the prior year. We control for year and industry fixed effects in all specifications. 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.

Panel A. RPT and Net Cash Flow						
	All	SOE	Non-SOE	All	SOE	Non-SOE
Variable	Model1	Model2	Model3	Model4	Model5	Model6
Total RPT Outflow/Assets	-0.001	-0.007	-0.002			
	(-0.153)	(-0.680)	(-0.150)			
Net RPT Outflow/Assets				-0.022**	-0.022**	-0.026
				(-2.261)	(-2.070)	(-1.150)
Log '(Total Assets)	0.001***	0.001	0.001	0.001	0.001	0.001
	(3.604)	(-0.615)	(1.482)	(0.769)	(-0.539)	(1.444)
ROA	0.238***	0.248***	0.304***	0.391***	0.247***	0.202***
	(6.254)	(10.985)	(6.615)	(8.892)	(10.980)	(6.620)
Leverage	-0.137***	-0.062***	-0.039***	-0.135***	-0.061***	-0.041**
	(-3.869)	(-6.840)	(-2.364)	(-4.462)	(-6.686)	(-2.440)
EBIT Growth	-0.002***	-0.001	0.003	-0.002***	-0.001	0.003
	(-3.738)	(-0.688)	(1.151)	(-3.523)	(-0.634)	(1.110)
Sales Growth	0.011**	0.008***	-0.008*	-0.012**	0.008***	-0.009*
	(2.475)	(2.758)	(1.810)	(-2.105)	(2.733)	(-1.869)
Intercept	-0.008*	-0.01	0.016	-0.053***	-0.009	0.017
	(-0.732)	(-1.559)	(1.423)	(-3.477)	(-1.437)	(1.540)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared '(%)	16.17	13.12	8.48	17.11	13.39	8.62
Observations	3503	2275	1228	3503	2275	1228

Panel B. RPT and Capital Expenditure						
	All	SOE	Non-SOE	All	SOE	Non-SOE
Variable	Model1	Model2	Model3	Model4	Model5	Model6
Net RPT Outflow/Assets	0.053	0.044**	0.062			
	(0.982)	(2.180)	(1.646)			
Total RPT Outflow/Assets				0.041	0.039**	0.045
				(1.120)	(2.152)	(1.248)
Log (Total Assets)	-0.001	0.001	-0.000***	-0.001**	0.001	-0.000***
	(-0.460)	(-0.439)	(-6.923)	(-2.098)	(-0.399)	(-6.895)
ROA	0.314***	0.281***	0.244***	-0.572	0.280***	0.244***
	(6.561)	(7.974)	(4.959)	(-1.495)	(7.966)	(4.934)
Leverage	0.131***	0.170***	0.085**	-0.088	0.173***	0.084**
	(4.834)	(9.599)	(2.350)	(-0.763)	(9.862)	(2.344)
Sales Growth	0.020***	0.016***	0.032***	-0.003	0.016***	0.032***
	(3.273)	(2.898)	(3.937)	(-0.198)	(2.911)	(4.032)
EBIT Growth	0.001***	0.002	0.006	0.002	0.002	0.006
	(2.570)	(0.594)	(1.045)	(0.633)	(0.623)	(1.059)
Intercept	0.086***	0.034***	0.01	0.147***	0.033***	0.008
	(5.626)	(2.737)	(0.666)	(5.429)	(2.708)	(0.501)
Year Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
R-squared (%)	6.33	10.56	9.27	6.54	10.54	9.18
Observations	3540	2291	1249	3540	2291	1249

Table X
Stock Performance of Listed State-Owned Firms in China

This table compares the stock return and operating performance of state-owned and non-state-owned firms in China over the period 2000 to 2013. State-owned firms are defined as firms that are ultimately controlled by the government agencies, based on the ownership information provided by CSMAR. The buy-and-hold returns are calculated by cumulating annual returns over years, including cash dividends. All variables are constructed following the approach described in Table I. This sample confines to firms that have non-missing "ultimate control" information in CSMAR. The dummy "SOE" refers to firms controlled by any of the below agent (1) central SASAC; (2) local SASAC; (3) Ministry of Finance; (4) other government agency. Central SOE refers to firms that are ultimately controlled by central SASAC or Ministry of Finance. Local SOE refers to firms that are ultimately controlled by local SASAC. T-values calculated using the standard errors clustered by country are reported in the parentheses. ***, ** and * denote the statistical significance at 1%, 5% and 10% level.

Panel A. BHR				
Variable	Model1	Model2	Model3	Model4
SOE	-0.057***			
	(-5.301)			
Central SOE		-0.050**		
		(-2.039)		
Local SOE			-0.068***	
			(-4.646)	
Other SOE				-0.006
				(-0.646)
Log (Total Assets)	0.096***	0.094***	0.104***	0.104**
	(4.626)	(3.145)	(3.411)	(2.344)
Leverage	-0.205***	-0.295***	-0.195**	-0.212***
	(-2.919)	(-3.084)	(-2.281)	(-2.628)
ROA	1.060***	0.844***	1.130***	0.932***
	(4.525)	(3.464)	(4.001)	(3.339)
ROE	0.126***	0.092***	0.108***	0.133***
	(15.680)	(12.508)	(13.430)	(10.897)
EBIT Growth	0.056***	0.056***	0.060***	0.065***
	(8.953)	(9.563)	(8.163)	(8.291)
Sales Growth	0.416***	0.392***	0.404***	0.381***
	(14.253)	(13.157)	(13.785)	(14.055)
Intercept	0.428***	0.478***	0.431***	0.473***
	(5.893)	(6.269)	(5.451)	(5.844)
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
R-squared (%)	40.36	38.41	39.41	38.40
Observations	22206	15642	16420	12651

Panel B. ROA				
Variable	Nodel1	Model2	Model3	Model4
SOE	-0.014***			
	(-3.747)			
Central SOE		-0.005		
		(-1.479)		
Local SOE			-0.018***	
			(-4.329)	
Other SOE				-0.014***
				(-2.849)
Leverage	-0.022*	-0.021	-0.032***	-0.021
	(-1.943)	(-1.484)	(-2.839)	(-1.282)
Log (Total Assets)	0.002	0.001	0.003	-0.001
	(0.912)	(0.583)	(1.543)	(-0.373)
Intercept	0.076***	0.039***	0.063***	0.063***
	(14.229)	(7.525)	(14.147)	(16.126)
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
R-squared (%)	5.06	24.05	6.22	6.99
Observations	28229	13869	20180	16376

Panel C. Net Cash Flow/Total Assets				
Variable	Nodel1	Model2	Model3	Model4
SOE	-0.004***			
	(-2.578)			
Central SOE		-0.001		
		(-0.482)		
Local SOE			-0.006***	
			(-3.503)	
Other SOE				-0.005
				(-1.585)
Leverage	-0.120***	-0.109***	-0.121***	-0.121***
	(-6.863)	(-6.178)	(-6.521)	(-6.950)
Log (Total Assets)	0.002	0.000	0.002**	0.002
	(1.536)	(-0.134)	(1.983)	(1.202)
Intercept	0.050***	0.047***	0.041***	0.046***
	(10.862)	(9.353)	(9.442)	(11.263)
Year Fixed Effects	Yes	Yes	Yes	Yes
Industry Fixed Effects	Yes	Yes	Yes	Yes
R-squared (%)	5.58	7.03	7.01	7.85
Observations	28229	23859	17298	16913