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

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Abstract

Domestically listed Chinese (A share) firms have lower stock returns than *externally* listed Chinese, developed and emerging country firms during 2000-2018. They also have lower *net cash flows* than matched *unlisted* Chinese firms. The underperformance in both stock and accounting returns is more pronounced for large A share firms, while small firms show no underperformance in either dimension. Investor sentiment explains low stock returns in the cross-country and within A share samples. Institutional deficiencies in IPO and delisting processes and weak corporate governance in terms of shareholder value creation are consistent with the underperformance in stock returns *and* net cash flows.

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I. INTRODUCTION

The Chinese economy has performed extraordinarily well in the past forty years. In 1980, China's GDP was around 11% of that of the US measured in constant dollars; by the end of 2018, China was the world's largest economy measured in Purchasing Power Parity (PPP) terms and was about 23% larger than that of the US.[1] Two other successful Asian economies in the post-WWII era are Taiwan and South Korea: their per capita GDP, in PPP terms, went from levels similar to those of African countries in 1950, to surpass those of Spain and Italy (South Korea), and Germany, France and the UK (Taiwan) at the end of 2018. The path of China's growth in per capita GDP, starting in 1980, closely tracks those of Taiwan and South Korea starting in 1960. Despite being a much larger economy, China has performed better at the 38-year mark along the growth trajectory than these two economies. It seems likely that the impressive growth of such a large economy has far exceeded expectations of most investors and pundits worldwide.[2] Given economic growth significantly above expectations, it might be expected that the stock market will also have outperformed.

The Chinese stock market started in 1990 with the establishment of two domestic stock exchanges (the "A share" market): the Shanghai Stock Exchange (SSE hereafter) and the Shenzhen Stock Exchange (SZSE). The number of listed firms has been growing since then, with more than 4,000 firms now listed in the two exchanges. The A share market is the second largest in the world in terms of total market capitalization, trailing only the US equity markets. Due to stringent listing requirements in the domestic market, among other reasons, a large number of Chinese firms are listed externally, mostly in the Hong Kong exchange (HKEX), which follows regulations similar to those in the US and is open to global investors. The second most popular external IPO destination for Chinese firms is the US.[3]

Despite the performance of the Chinese economy being arguably above expectations, listed firms in the domestic A share market have performed rather poorly, while externally

[1] GDP figures in 1980 are from the IMF; according to the Maddison project, China's GDP was around 25% of that of the US measured in constant dollars in 1980 (see http://www.ggdc.net/maddison/oriindex.htm). For 2018 GDP figures in PPP terms, see https://www.imf.org/external/pubs/ft/weo/2019/02/weodata/index.aspx.

[2] For example, the *Economist* (2018) comments in a lead article "China has grown rich beyond anybody's imagining." See Figures IA1 and IA2 in the Internet Appendix for the comparisons of per capita GDP growth of these three economies, as well as the cumulative returns of the stock indices.

[3] At the end of 2020, around 70% of the total market capitalization of HKEX is comprised of firms from Mainland China. Shortly after the news broke out in April 2020 that Luckin Coffee, a US listed Chinese firm, committed accounting fraud, the "Holding Foreign Companies Accountable Act" was introduced and was signed into law in December 2020. It requires that all (foreign) companies listed on US stock exchanges submit to audits reviewable by the US Public Company Accounting Oversight Board, and non-complying firms can be delisted after three years. Since then, Luckin Coffee and a number of state-owned enterprises (SOEs) have been delisted from the US, while some other Chinese firms, including Alibaba and JD.com, have conducted secondary offerings in the HKEX (see, e.g., *WSJ*, 10/2/2021).

listed Chinese firms have performed much better. Matched (by industry and size) *unlisted* Chinese firms have also significantly outperformed A share firms in terms of *net cash flows* (= EBITDA – Income Taxes – Changes in Working Capital – Capex, scaled by assets). These two groups of firms both operate in mainland China and are subject to the same institutional and economic factors as A share firms, apart from stock market listing.

During the period of 1992-2018, China's GDP grew by a factor of eight in real terms, much faster than other large economies. By contrast, the Shanghai Composite Index has been one of the worst performing indexes among large equity markets, and its performance is similar to the Nikkei from Japan. The Shanghai Composite rose sharply after its establishment but fell dramatically subsequently in real terms; this was in part due to high inflation in the early 1990s. Moreover, many securities laws and regulations were introduced and implemented after 2000, and the pace of adding new firms to the exchanges slowed down after 2000.

For these reasons, we focus on the period from January 1, 2000 to the end of 2018 for most of the firm-level analyses in the paper. The Chinese economy grew by a factor of 4.8 in real terms over this period, still much faster than the rest of the large economies, including India, Brazil, Japan and the US. Firm-level, cross-country regressions indicate that A share firms underperform a large set of listed firms from both developed and developing countries by 15.0% per year, while *externally* listed Chinese firms' performance is on par or better than the same set of listed firms from other countries during 2000-2018. In terms of cumulative, 'buy and hold' returns, the performance of the A share market is the worst among the group of large countries. The cumulative returns of the A share market are lower than those of five-year bank deposits or three- and five-year government bonds in China, and investors in the domestic stock market earned essentially zero net return in real terms.

We find that A share listed firms have much higher levels of investment (CAPEX scaled by assets) than that of matched unlisted Chinese firms and listed firms from other developed and developing economies. However, A share firms' net cash flows are lower than that of the groups of Chinese and foreign firms. Similar results are also found for large A share firms and matched externally listed Chinese firms. These results indicate investment inefficiencies of A share firms. Interestingly, the underperformance of A share firms in both stock and accounting returns, relative to other groups of firms, is more pronounced for large cap (largest 30%) companies. Small cap (smallest 30%) firms, on the other hand, do *not* underperform in terms of stock returns or accounting measures as compared to the same groups of firms.

What are the factors contributing to the operating performance gap of A share firms relative to matched unlisted Chinese firms and listed firms from other countries? Why are the

long-term returns from the world's second largest stock market lower than that of externally listed Chinese firms and listed firms from developed and emerging markets? What can explain the substantial performance gaps between small and large cap stocks within the A share market? These questions are the focus of our paper. Our empirical approach—analyzing both stock and accounting returns—allows us to depict a more complete and nuanced picture of how the performance gaps of the A share market vary across firms, and are explained by different sets of factors, than existing papers. As a component of our empirical strategy, we are the first in the literature to build a comprehensive dataset of externally listed Chinese firms.

We start by developing a simple model with an infinite horizon and risk-neutral investors to consider possible explanations for the low returns and cash flows for A share firms. There are two types of listed firms, and they have the same discount rate, which comes from the return on an alternative asset. The "A share firms" operate in an environment with poor institutions and are poorly governed, and have a low growth rate of cash flows, while externally listed firms operate in a good institutional environment, are well governed, and have a high growth rate of cash flows. We consider three versions of the model. In the first, investors have common beliefs on the likelihood of a set of market-wide institutional reforms including governance improvements—when they occur, the growth rate of cash flows of A share firms rises to the high level, and they become more valuable. The prospect of these reforms before they occur keeps stock prices of A share firms higher than they would be otherwise, and returns are lower than the cost of capital. Thus, the initial version of the model is consistent with the lower returns of A share firms relative to externally listed Chinese firms. We also calibrate the model with growth data for the two groups of firms during the sample period and demonstrate that the "jump" in returns and valuation after the reforms can be substantial.

The second version of the model is "behavioral," in the sense that investors have *heterogeneous* beliefs about the likelihood of the reforms and face short sale constraints, similar to Scheinkman and Xiong (2003) and Simsek (2021). We show that there is an equilibrium in which only the *optimistic* investors, who believe the reforms will occur with a higher probability, invest in the representative stock. Realistic investors, on the other hand, value the stock less than the alternative asset and only hold the latter. Similar to the case with common beliefs, as long as the reforms do not occur, low returns on the stock, as priced by the optimistic investors, will persist.

The practice of "financial repression"—policies that keep interest rates for household savings artificially low in support of lending and investment in other sectors of the economy—is widespread in developing economies and has been found to have adverse effects on

economic efficiencies and growth (e.g., McKinnon, 1973; Shaw, 1973; Roubini and Sala-i-Martin, 1992). In the third version of the model, we assume repression policies lower the return on the *risk-free* asset compared to what the market rate would be without these policies. Given segmented markets, this return is also lower than the risk-free return in the external markets, where foreign firms and externally listed Chinese firms are listed. The return on the stock in the domestically listed firms will again be lower than that in the externally listed firms as long as financial repression and capital controls are in place.[4]

Based on the first two versions of the model, we develop two hypotheses that can explain the poor performance of the A share firms relative to the other groups. First, deficiencies in *institutional* features of the domestic market including corporate governance, can explain poor performance as measured in *both* stock returns and accounting metrics. Second, domestic investors' behavioral biases can explain low stock returns in the A share market.

As part of the first hypothesis, we stipulate that problematic listing and delisting processes lead to adverse selection of firms in the A share market. Each listed firm must be approved by the China Securities Regulation Commission (CSRC, equivalent to the SEC in the US), and must show profits in two or three consecutive years leading up to the IPO application year to satisfy CSRC's listing standards. Moreover, one of the stated purposes of establishing the stock market was to promote the privatization of SOEs by helping them raise funds through markets. Hence, SOEs, firms from government-supported industries and those with connections to the regulators are more likely to be listed, whereas privately owned firms, especially those from new and growth industries without high, *current* profitability, face much higher hurdles.

For successfully listed firms, their performance falls sharply following the IPO. The average ROA (return on assets) dropped from 13% pre-IPO to just above 6% post-IPO, which is larger than the drop in ROA of listed firms from other markets. Our evidence also suggests that large A share firms use earnings management before IPO, and that the extent of earnings-boosting activities prior to IPO is greater than that for US firms, other emerging market firms, and externally listed Chinese firms. The net cash flows of A share firms are also lower than those of matched unlisted firms. These results indicate that the best-performing firms within an industry are not always selected to enter the A share market; listed firms 'prop up' their performance to clear the IPO hurdle but such performance is not sustainable post IPO.

Once listed, firms are rarely delisted from the exchanges in China and the 'shell' of a listed firm is valuable (e.g., Liu, Stambaugh, Yuan, 2019), given the difficult listing process. After

[4] We provide some preliminary evidence by comparing real interest rates in China and other economies (in Section IV below), which is consistent with the predictions of this version of the model.

two consecutive years of losses, listed firms in China are labeled "ST" (special treatment) but remain listed and traded in the exchanges. Compared to *delisted* firms from the US, including delisted Chinese firms, ST firms in China experience a similar or greater drop in performance (ROA and ROE) during the five-year period before receiving the ST status than US firms prior to their delisting. These results suggest that poor-performing firms are not dropped from the market, which worsens the adverse selection of the listed firms in the A share market.

Our first hypothesis also indicates that poor corporate governance, in terms of motivating and monitoring firms' management to create value for all the shareholders, especially minority shareholders, is consistent with the underperformance of the A share firms. As noted above, these firms have higher levels of investment than their counterparts in other countries (after IPO) but lower net cash flows, indicating low investment efficiency, which can result from poor shareholder governance. Multivariate analysis shows that the ratio of A share firms' *annual* net cash flows over assets is significantly lower than that of matched unlisted Chinese firms and is also lower than that of listed firms from the other countries. Lower net cash flows are also associated with more related-party transactions (RPTs) for A share firms, a proxy commonly used in the literature for tunneling by the controlling shareholders.[5]

Following prior literature (e.g., Gompers, Ishii, and Metrick, 2003; Cremers and Nair, 2005), we create a governance index that includes ownership concentration, insider ownership, and board structure (board size and CEO's role) and find it to be correlated with (future) stock and accounting returns in the cross-country sample of listed firms. Within the sample of A share firms, we add two dimensions—state ownership and the extent of insider 'tunneling,' based on the RPT variable—to create the A share governance index. This governance index can explain variations in stock returns and accounting performance across A share firms.

Some of the above results are also consistent with the second hypothesis based on investor behavioral biases, as illustrated by Xiong and Yu (2011), among others. They study prices and trading of a set of put warrants written on A share stocks during 2005-2008. The boom in the stock market pushed most of these warrants deep out-of-money, yet they were traded at significantly inflated prices, and their returns are uncorrelated with those of the underlying stocks. The authors conclude that the prices cannot be justified by rational expectations of the representative investor and highlight the effects of short-sale constraints and heterogeneous beliefs in driving the warrant bubble.

If a significant fraction of the A share investors does not fully understand the institutional

[5] Cheung, Rau and Stouraitis (2006), Fisman and Wang (2010), Jiang, Lee and Yue (2010), and Li, Lu, Qian and Zhu (2020), among others, all find evidence of tunneling activities among listed Chinese firms.

background of regulations and reforms, or the purpose and effects of insider activities of listed firms, but remain optimistic about the firms' prospects, stock prices can be higher and returns lower than when everyone has rational expectations. Insider activities include earnings management around IPOs, the process leading up to firms receiving the ST status and subsequent restructuring, and large-scale investment projects. As a result, the pricing of the stocks surrounding important events and poorly governed firms is inflated, leading to lower subsequent returns.

We follow prior literature (e.g., Mei, Scheinkman, and Xiong, 2009; Baker, Wurgler, and Yuan, 2012; Jia, Wang, and Xiong, 2017) and construct investor 'sentiment' measures at the market- and firm-levels and find that higher sentiment levels are associated with lower subsequent stock returns in both the cross-country sample and the A share sample. We then pool all the *institutional* factors, including deficiencies in the IPO process (proxied by the drop in ROA around IPO), the governance indexes (in both the cross-country sample and A share sample), and the behavioral factors into a unified framework to examine stock returns in both the cross-country and the A share samples. Investor sentiment (at the market level) is the most dominant factor in explaining the underperformance of A share stocks in the cross-country sample, while the cross-country governance index and the post-IPO performance drop are contributing factors. Within the A share sample, both the A share governance index and investor sentiment (based on turnover at the stock level) are important factors in explaining the variations of returns. Moreover, the A share governance index can also explain differences between large and small firms in both stock and accounting returns.

The normative implication of our results is that the CSRC should reform the IPO procedure to move towards a market-oriented process and encourage the listing of privately-owned firms and those from growth industries. The regulators should also strengthen the enforcement process of delisting poorly performing firms.[6] Most importantly, they need continue to improve the structure of the investor base by encouraging more institutional investors in the market to eliminate investor biases and increase firms' investment efficiency through strengthening corporate governance. Taken together, these measures can further improve the mixture of firms in the market as well as resource allocation and increase returns to all shareholders.

[6] The CSRC initiated a pilot program using a 'registration system' similar to those used in Hong Kong and the US, to select and list firms from a set of technology industries in the SSE in 2019. The "Science and Technology Innovation Board (STAR)" also includes strict implementation of the delisting procedure of poor-performing firms and firms found to have committed accounting frauds. This registration system has been extended to the GEM board of the SZSE in 2020, the newly established Beijing Stock Exchange in 2021, and the rest of the boards, including the main boards of both SSE and SZSE, in February 2023. See CSRC's website, http://www.csrc.gov.cn/pub/zjhpublic/zjh/201901/P020190130725847011706.pdf, for more details.

Our paper extends the literature on the benefits of foreign listing in developed markets by firms from emerging markets (e.g., Doidge, Karolyi, and Stulz, 2004, 2007). As Coffee (1999, 2002) points out, listing in a developed market, such as the US, provides a "bonding" mechanism for firms from emerging markets, where corporate governance is generally weak. We confirm these results by showing the performance gaps between domestically and externally listed Chinese firms. We demonstrate that the deficiencies in the domestic market, including problematic IPO and delisting processes and corporate governance, relative to those of external markets, as well as investors' behavioral biases, contribute to the gaps between domestic and externally listed Chinese firms.

Our work also contributes to a growing strand of literature on the Chinese equity markets. Liu, Stambaugh, and Yuan (2019) show that the Fama-French 3-factor model, with appropriate adjustments, can explain most reported anomalies in the A share market. Hu, Chen, Shao, and Wang (2019) find a significant size effect but no robust value effect. Hu, Pan and Wang (2021) find that while large stocks underperform other groups of stocks in the A share market and their counterparts in the US, small A share stocks actually provide higher returns. Carpenter, Lu, and Whitelaw (2021) examine the informativeness of stock prices about future profits, and the responsiveness of future investments on current profits and market prices for the period of 1995-2016 with *cross-sectional* tests. They find that both price informativeness and investment responsiveness in the A share market have reached levels similar to those in the US.

Similar to Hu et al. (2021), we also document the contrast between large and small stocks in terms of stock returns; in addition, we examine the factors that can explain the gaps in *operating* performance between these two groups of firms. In contrast to Carpenter et al. (2021), we examine the performance *gaps* in accounting and stock returns between A share firms and other groups of firms including externally listed and matched unlisted Chinese firms. We also provide a unified framework to examine two sets of factors—institutional deficiencies and investors' behavioral biases—in both the model and in empirical tests. In particular, poor shareholder governance can explain the disparities in both dimensions. Finally, we also show that rational expectation asset pricing factors, such as risk-free rates and firms' (risky) discount rates, risk as proxied by stock betas and volatilities of stock returns, and firm valuation as proxied by market-to-book (M/B) ratios, *cannot* seem to explain the underperformance of the Chinese A share market relative to markets from large advanced and emerging markets, and externally listed Chinese firms.

In Section II we introduce our data sets and study the performance of the A share market and equity markets around the globe. In Section III, we develop a model that generates different

sets of predictions on stock returns and cash flows. In Section IV, we follow the predictions of the model and conduct empirical tests to examine the reasons for the poor performance of the A share market and firms. Section V concludes. Appendix A contains definitions of the variables used in empirical tests, while the Internet Appendix reports additional results.

II. Data and An Evaluation of Markets and Firms

II.1. Data Sources and Sample Construction

Our study requires country-level data (from the World Bank) and variables describing institutional environment, including investor protection and legal institutions from the law and finance literature (e.g., La Porta, Lopez-De-Silanes, Shleifer and Vishny, LLSV 2002; Djankov, La Porta, Lopez-de-Silanes and Shleifer, DLLS 2008). Exchange-level data are from the World Federation of Exchanges, including variables that describe stock market characteristics. We extract annual data on stock returns (adjusted for splits) and financial information for firms listed in stock exchanges worldwide from *Worldscope* (part of *Datastream*). We also extract financial variables from Datastream, including firm size (assets), returns-on-assets (ROA), returns-on-equity (ROE), leverage (book debt/total assets), total accruals, and others. For listed firms in the US and a few other countries, we extract information from Compustat and CRSP. For governance variables of listed firms around the globe, we extract information from *BoardEx* and *Risk Metrics*. Finally, we follow Baker, Wurgler and Yuan (2012) and construct measures of investors' behavioral biases, including sentiment variables and IPO returns.[7] Our cross-country dataset includes more than 113 thousand unique firms listed in 157 exchanges located in 106 countries over the period 1991-2018; 3,695 firms are currently or were once listed in the Chinese A share market.

We explore a few additional sources to obtain information on the Chinese firms. For stock prices and split-adjusted returns of Chinese listed firms, we also use data compiled by the Chinese Capital Market Research Group (see, e.g., Wang, Hu and Pan, 2017). The Chinese Industrial Enterprises Database (CIED), released by the National Bureau of Statistics, provides comprehensive coverage for (mostly unlisted) firms from manufacturing industries with annual sales over RMB 5 million, for the period of 1998-2013. We collect information related to ownership structure and governance of Chinese listed firms (including those listed in HKEX) from WIND and CSMAR, which extract such information from firms' annual reports.

[7] We thank Jay Ritter for providing data on IPO first day returns and the number of IPOs for 17 large countries/markets. We use them to construct the investor sentiment measures for the 17 markets.

Table 1, Panel A presents the number of firms listed in SSE and SZSE and the number of externally listed Chinese firms. We focus on the period 2000-2018 for most of our firm-level analyses. Column 2 shows that while 70% of all the listed firms were SOEs in 2000, this ratio dropped to 30% in 2018. As indicated in Column 4, the number of externally listed Chinese firms increased to over 4 times its initial level from 2000 to 2018. The mean of total assets of these firms is around $10.61 billion in 2018, larger than that of A share firms (with mean $2.78 billion, Column 3). Table 1, Panel B presents the distribution of Chinese firms sorted by the listing region/country. The numbers of Chinese firms listed in Hong Kong and the US are 1,138, and 515, respectively.[8] Firms listed in HKEX have a larger average asset size than those listed in the US. Table 1, Panel C presents the distribution of listed firms in the other countries.

II.2. The Performance of the Chinese Stock Market and Listed Firms

Figure IA3, Panel A of the Internet Appendix shows the performance of the Shanghai Stock Exchange (SSE) Composite index, created in July 1992, and the stock indices of other large countries from 1992 to 2018. We normalize all the indices to 1 at the end of 1992, and account for the impact of inflation by adjusting the nominal returns in local currencies with year-end CPIs to obtain cumulative, monthly buy-and-hold returns (BHR) in real terms until the end of 2018. Despite the fact that the Chinese economy grew faster than the other large economies (see Figure IA1 in the Internet Appendix), the BHR of the SSE index is substantially lower than those of other emerging countries like Brazil and India, lower than that of US, and roughly the same as the Nikkei Index of Japan.[9] The SSE index had negative real returns during most of the 1990s; one reason is that inflation was high, with the CPI reaching 27% in 1994. The number of listed firms increased sharply from 13 in 1991 to 1,062 in 2000, and the intensity of adding new firms to the exchanges slowed down after 2000. Major securities laws and regulations were introduced in the late 1990s and fully implemented after 2000. Given our goal of studying the A share market comprised of a relatively steady number of listed firms for an extended period, we conduct most of our firm-level analyses for the period 2000-2018.

Figure 1 shows the BHRs of the five large markets and externally listed Chinese firms for

[8] Prior to the announcement of the pilot STAR program in the SSE, HKEX announced their amendments to the main board listing rules in April 2018, including: 1) allowing listings of biotech firms that do not meet the Main Board financial eligibility tests; (2) listings of companies with weighted voting right structures (for more details, see http://en-rules.hkex.com.hk/net_file_store/new_rulebooks/u/p/Update_119_Attachment_1.pdf).

[9] The A share market stays at almost the same level in 2017 as in 2014, partly because the Chinese "national team," composed of China Securities Finance Corp., Central Huijin Investment, the State Administration of Foreign Exchange, along with other government rescue funds entered the market to buy shares following the market crash in June and July 2015 (Huang, Miao and Wang, 2019). By the end of 2019, the stock holdings of the Central Huijin Investment amounted to RMB 3.02 trillion (http://www.huijin-inv.cn/huijin-inv/Investments/index.shtml).

2000-2018. BHRs are calculated as cumulative monthly stock returns (cash dividends included), averaged across all the listed firms in a country by month, with the market capitalization at the end of the previous year as the weight. Inflation is again adjusted for by using the value of local currencies in 2000 as the benchmark. If an investor invested RMB 1 in a value-weighted portfolio composed of listed stocks in the Chinese A share market in 2000, the real value of her portfolio would be RMB 1.01 at the end of 2018.[10] This is remarkably lower than those of other large emerging markets like India and Brazil, both of which see their initial investment in 2000 more than tripled in real terms at the end of 2018. The BHR of the Chinese market is even lower than that of Japan, which suffered from prolonged problems in the economy and financial markets during the sample period. Notably, as shown in Figure 2, the underperformance of the A share market is driven by large firms; the smallest 30% A share firms (in terms of market cap) actually outperform listed firms from the other markets in the second half of the sample period, especially since 2014.

An arguably better comparable group to firms listed in the A share market is the Chinese firms listed in external exchanges: since their operations and revenues are from (mainland) China, these firms share the same macro-economic and institutional environment (apart from the stock market) as their counterparts listed in the two domestic exchanges. Figure 1 shows that the BHR of this group of firms is around 344% in real terms by the end of 2018. The majority of these firms are listed in HKEX and the US stock market, including technology and e-commerce companies such as *Baidu, Alibaba, Tencent,* and *JD.com*. The BHR of externally listed Chinese firms are among the best performing stocks in the world over the sample period, and significantly outperform firms in the A share market regardless of the choice of currencies (HK/US dollar or RMB) to calculate stock prices and returns.[11]

Next, we compare the real returns from investing in Chinese stocks versus other investment channels such as bank deposits and government bonds. Since all the large banks are majority-owned by the government, the deposit rates are effectively risk-free rates. We accumulate the real deposit rates and plot the cumulative returns from rolling over bank deposits (see Figure IA4 in the Internet Appendix). Apart from the stock market peaks, the cumulative, annual stock returns are lower than the cumulative returns on the five-year deposits

[10] Few A share firms pay cash dividends, and the dividend yield of these firms is below 1% for most of our sample period. In 2018, the average dividend yields for China, Brazil, and US firms are 0.8%, 2.2%, 4.1%, respectively.
[11] We re-plot Figure 1 (see Figure IA3, Panel B in the Internet Appendix) after converting foreign currencies to RMB to obtain stock prices and returns for externally listed Chinese firms; since the RMB has appreciated against most currencies over the period, this conversion shrinks the gap between A share market and the foreign markets, but the A share market remains the worst-performing of the group. Note that the Chinese capital account is by and large closed, so ordinary Chinese retail investors have limited access to external/foreign markets.

and government bonds in most of the other years (during 2000-2018).

To explore factors that may affect stock performance, we estimate cross-sectional, linear regression models using exchange-level and country-level variables; we then add firm-level variables. The set of variables include: (1) country-level macro-economic conditions such as GDP growth, GDP per capita, the amount of credit from financial institutions to GDP ratio, etc.; (2) stock market characteristics, especially liquidity and risk; (3) investor protection measures developed by the law and finance literature (e.g., LLSV, 2002; DLLS, 2008), including the anti-self-dealing index, prevalence of tax evasion and the effectiveness of judicial procedure ("time to collect on a bounced check"); (4) firm-level financial and accounting variables. All explanatory variables are lagged by one year when entering the regressions. The goal of the regression models is to use listed firms from other countries as benchmarks to measure the performance (as measured in annual stock returns) of listed firms from China.[12]

To account for possible biases in stock prices (and returns) due to microstructure problems in trading, we employ weighted least squares (WLS) regressions of firm-level annual stock returns on country-, exchange- and firm-level variables.[13] We exclude countries/economies with fewer than 20 stocks in a given year. Almost 100,000 firms from 80 countries enter the regressions with firm-level controls. Table 2 presents the results. The key variable of interest is *A share Listed*, an indicator taking the value of 1 if the firm is listed in SSE or SZSE.

From Columns 1 and 3 of Panel A, the negative coefficients of the *A share Listed* indicator show that A share firms underperformed firms listed in other countries by 14.6% in annual returns for the period 1991-2018, and by 16.0% per annum for the period 2000-2018 (both significant at the 1% level). In Columns 2 and 4, we add firm-level variables and find that younger firms and firms with higher profitability (ROA) have higher returns. The magnitude of the negative coefficients of the *A share Listed* indicator is similar to that of those reported in Columns 1 and 3, and these coefficients are statistically significant at the 5% or 1% level.

[12] Due to IPO underpricing, we follow the literature (e.g., Aggarwal, Krigman, and Womack, 2002; Loughran and Ritter, 2002) and use the closing price on the first trading day (instead of the offer price) to calculate returns in the IPO year. For firms that are delisted from an exchange, we follow Shumway (1997) to set the delisting return (i.e., returns in the year following delisting) to be -30%. We also set the delisting return to be -100% or zero, and the results are qualitatively unchanged under alternative assumptions about the delisting returns.

[13] Asparouhova, Bessembinder, and Kalcheva (2013) show that microstructure issues in trading impose noise in observed stock prices, which in turn leads to biases in panel regressions analyzing returns. Similar to Ben-Rephael et al. (2021), we take the WLS approach in linear regressions when the dependent variable is stock return, with lagged market cap of the firms as the weight. To measure stock returns, we also use log (1+ return) to rerun all the regressions and obtained qualitatively similar results (see Panels A-D, Table IA1 in the Internet Appendix). Following Hou et al (2011), we winsorize the sample and drop 'penny stocks' (stocks with small unit prices) from all the markets and run OLS regressions on stock returns, and also obtain qualitatively similar results (Table IA1, Panel E) as those from Table 2. We use OLS regressions in the other tests in which the dependent variable is an accounting measure, such as investment, cash flows, or ROA (or changes in ROA).

In Panel B we compare externally listed Chinese firms with firms from other countries. The variable of interest is *Externally Listed Chinese Firms*, an indicator taking the value of 1 if the firm is headquartered in Mainland China and listed in external exchanges, such as those in the US and Hong Kong. These Chinese firms outperform firms from other countries: for example, during the period 2000-2018, they outperform other firms by 8.65% per year (Column 3), but the result is not statistically significant.[14] Finally, the differences between the coefficients of the "A share Listed" and "Externally Listed Chinese Firms" indicators are all statistically significant (see the bottom of Panel A). These findings provide evidence that the underperformance of firms in the A share market is *not* simply because they are based in China.

In Panel C, we exclude the IPO years (year 0 and year +1 after IPO) and rerun the tests on stock returns. We continue to find significant negative coefficients of the "A share Listed" indicator and significant differences in the coefficients when compared with the "Externally Listed Chinese Firms" indicator. These results indicate that the underperformance of the A share market is not only related to the IPO process but also related to listed firms' activities after the IPO. We investigate these activities in Section IV below.

Our results also illustrate considerable heterogeneities in stock market performance across various subsets of A share firms. From Panel D, the coefficient on the A share indicator falls from 14.95 percentage points for the whole sample (Column 1, same as Column 4 in Panel A) to 12.75 points (Column 2) after dropping the SOEs. This result suggests that both non-SOEs and SOEs contribute to the underperformance of A share firms. After dropping the largest 30% firms (by lagged one-year market capitalization), we find that the coefficient of the A share indicator remains negative (Column 3), but loses its statistical significance, indicating that the underperformance of A share firms is mainly attributed to the poor performance of the largest firms. The smallest 30% A share firms, on the other hand, outperform (all the) firms listed in other countries by 2.22 percentage points per year (statistically insignificant, Column 4), while the largest 30% A share firms underperform other groups of firms by 15.52 percentage points per year (significant at 1%, Column 5). Overall, our findings corroborate previous results on the performance gap between small and large A share firms (Hu, Pan and Wang, 2021).

Another group that has outperformed the A share listed firms is matched unlisted firms. For each listed firm in its IPO year, we match with one unlisted firm from the same (manufacturing) industry based on the Datastream level-2 industry classifications from the CIED database; the ratio of the book assets of the listed firm and that of the matched unlisted

[14] In Table IA2 of the Internet Appendix, we find that Hong Kong listed Chinese firms outperform listed firms from the other countries by around 5.96% per year (no firm controls, statistically insignificant) during 2000-2018.

firm is within the range [80%, 120%], and we select the matched firm as the one that is closest in size to the listed firm. Out of the 2,080 manufacturing listed firms in our sample for the period 1998-2013, 1,570 have both the IPO date and non-missing asset size in the IPO year. We find one matched unlisted firm for each of the 1,407 distinct A share firms; very large manufacturing firms and non-manufacturing firms from the A share sample do *not* have a matched unlisted firm. A share firms generate significantly lower net cash flows than their matched unlisted firms (see Table 7 below for more details).

As a final piece of evidence, we study the correlations between the 5-year stock returns and *future* GDP growth for the largest 20 economies (over 1991-2018). The exact relationship between stock market performance and economic performance is determined by a large set of factors and possibly their interactive effects. Hence, we do *not* expect positive and significant correlations between (long-run) stock market returns and (future) GDP growth rates for all the economies studied here. As shown in Table 3, the stock market appears to be a *leading* indicator for the economy in many developed countries. The correlation between the two is also positive and significant in large emerging economies such as India, Russia, and Brazil. The correlation for the A share market, however, is –1.3% with a *p*-value of 0.637; thus, the performance of the stock market is *unrelated* to the future performance of the economy. Interestingly, the correlation between the returns of the *externally* listed Chinese firms and China's subsequent GDP growth (over 1998-2018) is 41% and statistically significant (*p*-value = 0.024). These results again highlight the differences between the A share and externally listed Chinese firms, in that the A share listed firms are not representative of the economy as a whole, while the latter behave much more like listed firms from other emerging markets.[15]

III. A Model of Institutional Reforms, Investor Heterogeneity, and Financial Repression

We have shown that the A share market has underperformed externally listed Chinese firms and listed firms from other (emerging) markets in terms of stock returns. It has also underperformed matched unlisted Chinese firms' accounting returns. In this section, we develop a simple model to provide testable predictions to guide further empirical tests on factors that can explain poor stock returns and operating performance of A share listed firms.

[15] An interesting question is to what degree the underperformance of A share firms relative to externally listed Chinese firms extends to other emerging countries. In this regard, we collected a sample of externally listed Indian firms (most of which are listed in Europe) and find that their BHRs are not significantly different from that of domestically listed Indian firms, while their operating performance is worse than domestically listed firms (see Figure IA5 and Table IA3 of the Internet Appendix).

We start by setting up a baseline model to show how the possibility of comprehensive institutional and governance reforms can lead to low stock returns until the reforms are implemented. In the second version of the model, behavioral factors are introduced by assuming there are two groups of investors that differ in their beliefs. There is a realistic group that has rational expectations and an optimistic group that overestimates the probability of reforms. If the optimistic group is the marginal holder of the representative firm's stock, it will have a high value and a low return. Finally, we consider the effects of a financially repressed risk-free interest rate within China. This lowers the relevant opportunity cost for holders of shares of stocks. For externally listed stocks and listed firms from other markets, the opportunity cost can be higher, and so are the returns on these stocks.

In our infinite horizon model with discrete periods, all the investors are risk neutral. Initially, the institutional environment and corporate governance are in a low state and the growth rate of cash flows per period is g_L. The cash flow just before t, C_{Lt}, is drawn from a distribution with mean EC_{Lt}, and is paid to the shareholders, and so it plays no role in valuation. At date t, there is an announcement that occurs with probability π about whether comprehensive institutional reforms including governance reforms for the whole market will be implemented between t and t+1. All valuations at date t are calculated *after* the time of the announcement. If reforms are announced and implemented at t, then the growth rate of cash flows between t and t+1 is g_H, so $EC_{Ht+1} = EC_{Lt}(1+ g_H)$, and the growth rate remains at g_H in perpetuity. If no reforms are announced and implemented at t, the growth rate of cash flows remains at g_L, $EC_{Lt+1} = EC_{Lt}(1+ g_L)$, and there is again an announcement about comprehensive reforms (with probability π) at t+1. The process then repeats itself until reforms are implemented. Figure 3 illustrates the timeline of the model.

III.1. The Basic Model with Common Investor Beliefs

We also assume that there is a technology in perfectly elastic supply, where an investment of 1 unit of capital results in a return of 1 + r. The wealth of investors and the value of the representative firm's stock are such that this alternative asset is always held by some investors. The opportunity cost of capital for funding the representative firm's risky project is then r, and it is assumed $r > g_H > g_L$. In the baseline version, all the investors have *homogeneous* beliefs about the likelihood π that there will be comprehensive institutional and governance reforms.

Following the announcement of comprehensive reforms at date t, the value of the firm reaches the *high* state and remains in the state forever, and is denoted by V_{Ht}:

$$V_{Ht} = \frac{EC_{Lt}(1+g_H)}{r-g_H}. \quad (1)$$

If there is no announcement of the reforms at date *t*, then institutions and corporate governance are still in the low state, and the representative firm's expected value is:

$$V_{Lt} = \frac{EC_{Lt+1}+\pi V_{LHt+1}+(1-\pi)V_{LLt+1}}{1+r}. \quad (2)$$

The first term in the numerator of Eq. (2), EC_{Lt+1}, is the expected cash flow at date *t* given that an announcement of comprehensive reforms wasn't made at the start of the period. For the second term, with probability π an announcement will be made at date t+1, and the expected value of the firm just after the announcement will be:

$$V_{LHt+1} = \frac{EC_{Lt}(1+g_L)(1+g_H)}{r-g_H}.$$

For the third term in Eq. (2), with probability $1 - \pi$ the announcement won't be made at date t+1, in which case the end-of-period value is V_{LLt+1}. All three terms are the values at date t+1 and are discounted back to date *t* by dividing by $1 + r$. Solving (1) and (2) recursively (as shown in Section 8 of the Internet Appendix), we have:

$$V_{Lt} = EC_{Lt}\left(1 + \frac{\pi(1+g_H)}{r-g_H}\right)\left(\frac{1+g_L}{r-g_L+\pi(1+g_L)}\right). \quad (3)$$

When the reforms do *not* materialize, the *ex post* current period return R_L is given by:

$$R_L \equiv 1 + r_L = \frac{EC_{Lt+1}+V_{LLt+1}}{V_{Lt}} = (1 + r) - (g_H - g_L)\left(\frac{\pi(1+r)}{r-g_H+\pi(1+g_H)}\right), \quad (4)$$

with the second step in Eq. (4) above derived in the Internet Appendix. When the reforms do occur, the *ex post* current period return R_H is given by:

$$R_H \equiv 1 + r_H = \frac{EC_{Ht+1}+V_{HHt+1}}{V_{L,t}} = (1 + \mathrm{r})\frac{(1+g_H)}{(1+g_L)}\frac{(r+\pi-g_L(1-\pi))}{(r+\pi-g_H(1-\pi))}, \quad (5)$$

and once again, the second step in Eq. (5) above is derived in the Internet Appendix.

Proposition 1. *The* ex post *return* without *the announcement of reforms, R_L, and the return with the announcement, R_H, satisfy, $R_L < 1 + r < R_H$, where r is the opportunity cost of capital. Moreover, the return in the low state, R_L, is* decreasing *in* π.

Proof: Derivations using Eqs. (4) and (5), and $r > g_H > g_L$, are given in the Internet Appendix.

Hence, in the homogeneous belief case, so long as the announcement of reforms hasn't arrived (so the end-of-period growth rate of cash flows of the representative firm remains low), the return on the stock is *below* the opportunity cost *r*. This can be interpreted as the situation

in the A share market. With the arrival of the announcement and implementation of the reforms, investors realize a "jump" in return, from R_L to R_H in the current period, as compared to the no announcement state. Following this jump, the representative firm's stock will earn a return of r every period, its opportunity cost, thereafter. When the probability of a reform is higher, investors will be even more disappointed if it turns out that such reforms have not taken place, and a lower stock return will be realized as a result.

Next, we calibrate the model with reasonable parameters and cash flow levels from actual data (of A share firms and externally listed Chinese firms), and then derive the valuation differences between V_{LH} and V_L, which maps to the cumulative return differences between A share firms and Chinese firms listed externally over 2000-2018, and the jump from R_L to R_H. From Table 4, we assume three scenarios in which the probability of successful institutional and governance reforms π takes values of 0.02, 0.05, and 0.1; the opportunity cost of capital is assumed to be 12% or 15% per annum. We use the annualized nominal stock returns of the A share firms (4%) and externally listed Chinese firms (10%) during 2000-2018 to proxy for the growth rates g_L and g_H, and normalize EC_L to be 1. Looking at the case that the likelihood of market-wide reforms is 2% and the opportunity cost of capital is 12%, we observe that firm value jumps from a low value of 21.34 (V_L) to the high value of 54.48 (V_{LH}) when the reforms occur, or an increase of 155%. The associated stock return rises from R_L of 1.09 (below the opportunity cost) to R_H 2.75 (high return), or a substantial increase of 166%.

There were several governance reforms in China during the sample period. We briefly discuss the "Split-share Reform (SSR), taking place from 2005 to 2007, in the context of the model and the calibration exercise here. The key aspect of the reform was the floating of *nontradable* shares, which were mostly controlled by various government agencies. In Tables IA4-IA6 of the Internet Appendix, we find that stock prices rose in anticipation of the reform, especially for firms with larger fractions of nontradable shares. However, during the post-reform period (2008-2010), we do not find the average growth rates of A share firms' cash flows to be significantly different from that leading up to the reform (2003-2005; see Table IA7 of the Internet Appendix), which were significantly below those of the Chinese firms listed in Hong Kong. Hence, as predicted by Proposition 1, stock prices fell back to pre-reform levels, since investors realized that the growth rates in firms' cash flows did not improve sufficiently to warrant a large and 'permanent' jump in stock prices.

III.2. A Behavioral Model with Heterogenous Investor Beliefs

Following Scheinkman and Xiong (2003) and Simsek (2021), we next assume there are

two types of investors. A fraction α of investors hold the optimistic (OP) view that the announcement of comprehensive institutional and governance reforms takes place at date *t* with probability π_H. The remaining $(1-\alpha)$ of the population are realistic (RL) and believe the reforms will take place with probability π as before, where $\pi_H > \pi$. Investors thus hold different beliefs about the likelihood of the reforms, and they agree to disagree about their beliefs. The other features of the model stay the same as the baseline case.[16]

For there to be an equilibrium with two types of risk-neutral investors with different beliefs, there need to be short sale constraints: we assume no short sales on any asset. The nature of equilibrium depends on which group is the *marginal* holder of the stock of the representative firm. Accordingly, we specify the wealth of the two groups and the total value of the firm's stock: the wealth of the optimistic (realistic) group at date *t* is W_{OPt} (W_{RLt}) and the total value of the representative firm's stock is S_t. In order for shares of the representative firm's stock and the alternative asset to be held in the equilibrium, it is necessary that

$$W_{OPt} + W_{RLt} > S_t. \tag{6}$$

We assume the condition in (6) is satisfied throughout this version of the model, so that there is always some investment in the alternative asset, and the marginal holder of the firm's shares must be indifferent between holding the stock and the alternative asset. This means that the return on the alternative asset, *r*, is also the opportunity cost of capital and the discount rate for (firm) valuation. There are two possibilities for the equilibrium, and they are as follows.

Case (i) $W_{OPt} < S_t$

In this case, the marginal holder of the asset is the RL group. The market values of the firm in the high and low states are denoted by V_{Ht} and V_{Lt}, as in Eqs. (1) and (2). The OP group will put all their wealth in the stock when institutions and corporate governance are in the low state, because their valuation is

$$V_{Lt}^{OP} = \frac{EC_{Lt+1} + \pi_H V_{LHt+1} + (1-\pi_H) V_{LLt+1}}{1+r} > V_{Lt}, \tag{7}$$

since $\pi_H > \pi$ and $V_{LHt+1} > V_{LLt+1}$. They would also like to short the alternative asset and invest the proceeds in the stock but are unable to do so due to the short sales constraint. The best they can do is hold none of the alternative asset. If it is expected that $W_{OPt} < S_t$ will continue to hold in the low state going forward, then Eqs. (3)-(5) will continue to hold and the equilibrium will

[16] We can also model investor optimism in other forms—for example, OP investors holding the belief that the growth rate in cash flows, following the implementation of the comprehensive reforms, is greater than g_H—and yield similar results on valuations and returns.

be the same as in Proposition 1 of the previous section.

Case (ii) $W_{OPt} \geq S_t$

Here, the OP group will be the marginal holder of the stock. They will hold both types of assets and the price of the stock in the low state will be given by V_{Lt}^{OP} in Eq. (7). The RL group will put all their wealth in the alternative asset. They would also like to short the stock and put the proceeds in the alternative asset but cannot do so because of the short sale constraint.

If $W_{OPt} \geq S_t$ is expected to continue to be satisfied, then the equilibrium will be specified as in Eqs. (3)-(5), but with π replaced by π_H. Given $\pi_H > \pi$ and the fact that R_L is decreasing in π, we have $R_L^{OP} < R_L$, so that the return in the low state will be lower the more optimistic is the OP group. These arguments lead to the following result.

Proposition 2. *(i) If $W_{OPt} < S_t$ is satisfied at date t and is expected to be satisfied in the low institutional and governance state going forward, then the equilibrium prices and returns will be the same as in Proposition 1. (ii) If $W_{OPt} \geq S_t$ is satisfied at date t and expected to be satisfied going forward in the low state, optimistic* investors *hold the stock and alternative asset, while realistic investors hold just the alternative asset. Ex post current period return following the announcement of institutional and governance reforms is R_H^{OP}, and the return without the announcement is R_L^{OP}, satisfying $R_L^{OP} < 1 + r < R_H^{OP}$, where r is the opportunity cost of risky capital. Moreover, R_L^{OP} is decreasing in π_H.*

Proposition 2 (ii) shows that, for the realistic investors, their valuation of the stock is below that of the alternative asset; with the short-sale constraints binding they would not hold the stock, and hence in equilibrium the stock price is set at a high level by the optimists. As a result, so long as the announcement of the reforms hasn't materialized, return on the stock, $R_L^{OP}(\pi_H)$, determined by the optimistic investors, is again below the opportunity cost (1 + *r*), and this can be interpreted as the situation in the A share market. In addition, the more optimistic the belief on the likelihood of the announcement (i.e., an increase in π_H), the lower the *ex post* return, as the degree of disappointment is greater.

We have shown that our model can deliver low stock returns via two different channels: common beliefs on the likelihood of successful reforms and the realization of the 'no reform' state (Proposition 1), or optimistic investors' "irrationally exuberant" beliefs on the probability of the good state occurring, followed by the arrival of the bad state (Proposition 2). Both versions of the model can be extended to consider two types of firms. For example, the two types can be large and small A share firms with different increases in growth rates of cash flows following successful institutional reforms. If large firms have a greater increase in the growth rate of cash flows than small firms as a result of reforms, then they will have lower stock return

in the bad state. Similarly, we can also extend the behavioral version and consider different belief structures on the two types of firms. It is an empirical question how much of the low returns can be explained by these institutional and governance factors or behavioral factors.

III.3 Financial Repression as an Explanation of Low Returns

So far, the representative firm has been listed in the domestic market where the opportunity cost of capital is r. We next consider a situation where externally listed Chinese firms, and foreign listed firms, including those from the developed and some emerging markets, operate in environments with strong institutions and a different opportunity cost of capital, r_{EX}. For simplicity, we consider the special case of the model where $\pi = 0$ and beliefs are homogeneous. All firms have the same level of corporate governance, and their cash flows grow at rate g. The opportunity cost r_{EX} comes from the return on the alternative asset—which for simplicity we assume to be the risk-free asset here, but more generally, this will affect all opportunity costs—that is available in the markets outside the domestic market. We also assume that there are capital controls, so that the external and internal markets are *segmented*. Moreover, there is "financial repression" in the domestic market due to government policies to subsidize SOEs and strategic sectors. These lead to the following condition between the domestic opportunity cost of capital (r) and its counterpart in the external markets:

$$r < r_{EX}. \tag{8}$$

This version of the model provides a third reason why the return on internally listed firms can be below that on the foreign firms and externally listed Chinese firms. The externally listed firms will earn a return r_{EX}. The internally listed firms will earn

$$1 + r < 1 + r_{EX}. \tag{9}$$

The next proposition summarizes our analysis in this subsection.

Proposition 3. *With "financial repression" policies and segmented capital markets, where the opportunity cost of capital in the external markets, r_{EX}, is greater than that in the domestic market, r, the return on domestically listed firms will be below that on externally listed firms.*

For the more general case where $\pi > 0$ and beliefs are heterogeneous, similar results will hold provided there is financial repression and capital markets are segmented. There will be a lower return on domestic stocks compared to external stocks.

III.4 Model Predictions and Empirical Hypotheses

Based on the different versions of the model analyzed in the previous sections, we develop three hypotheses with the goal of explaining the gaps in stock returns and accounting performance of the A share listed firms relative to those from other markets and externally

listed Chinese firms. First, in the baseline case (Proposition 1) and the calibration exercise, the common beliefs on the prospect and the realization of comprehensive institutional and governance reforms drive both firms' *cash flows* and returns. Accordingly, we postulate that "institutional imperfections" in the A share market, including problematic IPO and delisting processes, and deficiencies in corporate governance, as measured by various mechanisms related to motivating and monitoring firms' management to create value for *all* the shareholders, including ownership and board structures, can explain poor performance as measured in *both* stock returns and accounting metrics compared to other groups of firms. Moreover, we follow prior literature and construct a governance index for the cross-country sample of listed firms (by summarizing the governance variables), and another index for the A share firms with two additional variables—state ownership and RPT. In our cross-sectional tests performed at the firm level (e.g., cross-country sample and within the A share market), those with lower values of the governance indexes are expected to have worse (future) performance.

Second, with heterogeneous investor beliefs on the likelihood of comprehensive reforms and when the *optimistic* investors have sufficient wealth (so that they can hold all the stock and some alternative asset, as indicated in Proposition 2 (ii)), stock returns are determined by these optimistic investors, who also face short-sale constraints. Such investors' biases can be proxied by market-level sentiment factors, which are based on IPO activities, trading and return volatilities, with higher sentiment levels denoting more optimistic views. Following prior work, we also adopt the "A-H price premium" as a proxy for higher sentiment in the A share market over that of the H share (Hong Kong) market, as well as stock-level sentiment factors based on trading and turnovers. We hypothesize that market-level sentiment factors can explain low returns in the A share market relative to the other markets, while stock-level measures can explain cross-sectional return patterns within the A share market.

Third, as part of the macro policies in the traditional growth model—the Chinese government had kept bank deposit and lending rates low so as to boost investment and growth in manufacturing and other related "strategically important" sectors. In addition, the government has tight capital controls so that only very limited capital can flow between the domestic and external markets.[17] This "financial repression" hypothesis (and Proposition 3) implies that the interest rates remain low in China as compared to other markets, and persistently low opportunity cost for capital also lead to lower stock returns in the A share market as compared to those in the external markets. As a preliminary test of the hypothesis,

[17] An example of limited capital flows is the Shanghai- and Shenzhen-Hong Kong stock connects, with the volume of flows constituting less than 2% of total trading volume in these markets as measured as in December 2020.

we compare real interest rates in major economies and in different markets, including those where the stocks of externally listed Chinese firms are traded.

IV. Examining Reasons for the Poor Performance of A share Listed Firms

In this section, we examine reasons behind the poor performance of the A share firms relative to listed firms from other markets, externally listed Chinese firms, and matched unlisted firms, with performance measured in both stock returns and accounting measures such as net cash flows and ROA. We first study the "institutional deficiencies" hypothesis, and the IPO and delisting mechanisms as well as corporate governance in China and elsewhere (Section IV.1). Next, in Section IV.2, we examine the "investor behavioral biases" hypothesis, and pool the two sets of factors together to gauge their quantitative impact in explaining the gaps of A share listed firms relative to other groups of firms. In Section IV.3 we study the "financial repression" hypothesis by comparing real interest rates in large economies. Finally, we explore reasons behind the performance gaps between small and large A share firms and other asset pricing factors behind the underperformance of the A share firms and conduct a number of robustness checks (Section IV.4).

IV.1 Institutional Deficiencies: IPO and Delisting Processes, and Corporate Governance

Prior research has shown that firms 'time' their IPOs, in that insiders choose the year to sell their stocks to the public during which their operating performance tends to be the strongest. Interestingly, A share firms experience larger post-IPO drop in performance: the average ROA falls from a high of 13% in the year before the IPO to 6% in the year after the IPO. In contrast, the average ROA of firms listed in the US goes from 4.9% before the IPO year to 4.5% one year later, and the average ROA of firms listed in India falls from 12.1% to 9.9% during the same event window.

Table 5, Panel A presents OLS regression results comparing changes in operating performance around IPOs for A share firms and other groups of firms. The dependent variables are the change in ROA and change in ROS (return on sales) in years around the IPO. Consistent with univariate results, A share firms see their ROA drop by 2.4% more than firms from other countries around the IPO window of one year before to one year after the IPO (denoted by [-1, +1]); results are similar in the longer window of [-2, +2]. We also observe greater drops in ROS in both sets of windows. The larger drop in ROA and ROS could result from A share firms raising more capital in their IPOs, thus increasing the size of their assets. We control for the change in cash holdings scaled by book assets during the period [-1, 0] to proxy for the proceeds

raised in the IPO; the inclusion of this variable does not change the main results.[18]

Panel B of Table 5 shows the results comparing changes in the same operating performance measures for A share firms and externally listed Chinese firms. We include firm location fixed effects in these models. A share firms again see a much greater drop in ROA and ROS than those listed externally. Both sets of firms have their operations in China, and so the sharp fall in operating performance of A share listed firms is more likely to be related to institutional deficiencies of the domestic market, and in particular, problems in the listing process.

As stated earlier, firms must also show profits in two or three consecutive years leading up to the date when they apply for an IPO in the A share market.[19] As a result of these performance hurdles, firms from growth industries without high, *current* profitability are underrepresented in the A share market, which is dominated by large firms from mature industries. As discussed above, matched unlisted firms have higher net cash flows than their A share listed counterparts, while there is no difference in performance between externally listed firms and their matched unlisted firms. These results demonstrate that it is not the best-performing firms from their respective industries that are selected to enter the A share market.

Prior research shows that firms employ earnings management prior to their IPOs to boost their performance. Hence, one reason for the substantial drop in operating performance for A share firms is that they manage accruals upwards before the IPO, and when accruals show a reversal so does the operating performance. Following Aharony, Lee and Wong (2000), we compare the metrics of earnings management around IPO for listed firms in China, firms listed in other countries for which the pre-IPO financial data are available, and externally listed Chinese firms in the event windows of [-1, +1] and [-2, +2] around IPOs. We examine two earnings components: Total Accruals and Operating Cash Flows. We define Total Accruals as Net Income – Operating Cash Flows (OCF), and OCF is calculated as EBITDA – Income Taxes – Changes in Working Capital. Each component is scaled by contemporaneous sales (revenue).

We employ similar specifications as in Table 5 to estimate the changes in earnings

[18] In Internet Appendix Table IA8, we separate the A share firms (and firms from other countries) into five different cohorts by the year of their IPOs, with the first Cohort 2000-2003 indicating firms conducted IPOs during 2000-2003. A share firms in all five groups show similar declines in ROA and ROS during the post-IPO period (and greater declines than those of firms from other countries), suggesting that the deterioration in performance is *not* a phenomenon specific to firms listed in certain years.

[19] The CSRC specifies a list of listing requirements of the 'Main Boards' of the A share market, including: 1) firms have positive earnings in three consecutive years prior to the IPO and have accumulated total net income of RMB 30 million or more; 2) firms have accumulated cash flows (in net) from operations, investment and financing of RMB 50 million or more, or have total revenues of at least RMB 300 million in the three years prior to the IPO. Smaller firms listed in the 'SME Board' (small and medium-sized enterprises) require positive profits for three consecutive years, and the 'GEM Board' (Growth Enterprise Market) requires positive profits for two consecutive years. See http://www.gov.cn/flfg/2006-05/18/content_283660.htm for more details.

management measures around IPO. From Table 6, Panel A, with country and firm variables (before IPO) included as controls, the largest 30% of A share firms see their total accruals drop by 10.3% from one year before IPO to one year after the IPO (significant at the 5% level) relative to firms listed in other countries. We also find that these firms experienced greater decline in Total Accruals/Sales around IPO than externally listed Chinese firms. In addition, large A share firms experience a 2.3% (but statistically insignificant) higher increase in OCF than firms from other countries over the window [-1, +1].

These findings suggest that the deterioration in operating performance of large A share firms after IPO is *not* driven by mean reversion of ROA alone—if the decline in ROA were from mean reversion, both OCF and total accruals would decline post IPO. Instead, our evidence on total accruals and operating cash flows suggests that high operating performance of large A share firms before IPO mainly comes from accruals and *not* cash flows; and the subsequent decline is associated with a decline in accruals but not cash flows from operations. In summary, large A share firms manipulate their earnings prior to the IPO in order to meet the high hurdles for listing in the A share market, and when the effects of these manipulations fade, their performance also weakens.

In Internet Appendix Table IA9, we examine IPO returns (over one-day and one-month horizons) for "dual-listed" stocks—those listed in both the A share and HKEX. These firms operate in mainland China and have the same fundamentals, and their IPO returns are mainly driven by different market conditions. Interestingly, their IPO returns in the A share market are higher than those in HKEX. These results are consistent with the investor biases hypothesis, in that A share investors do not fully understand firms' earnings management around IPOs, and the pricing of the IPO stocks in the secondary market is inflated. Recall that in Table 2, Panels C and D, we drop firm observations during the IPO years, and continue to find that A share firms underperform those from other markets and externally listed Chinese firms. Hence, we can reject the conjecture that the gap in stock returns of A share firms relative to externally listed Chinese firms is due to lower IPO returns of the latter group.

The Delisting Process

An important feature of the A share market is that firms are rarely delisted. Around 5 stocks (or 2.7%) are delisted from the exchanges each year over 2000-2018, and less than half are delisted due to poor (operating) performance (other reasons for delisting include mergers and acquisitions, privatization, etc.). Many more firms are delisted in other markets. For example, over 2000-2018 the (annual) average percentages of delisted firms in the US and

Brazil are 32.8% and 13%, respectively; in the US, about one third of the cases, or 10.6% of the listed firms (0.322 × 0.328 = 10.6%), were delisted due to poor performance.[20]

Ideally, we should compare the operating performance of firms approaching the delisting dates in China and in other countries, but the small number of delisting cases in China makes a statistical comparison difficult. After two consecutive years of losses, listed firms in the A share market are labeled "ST" (special treatment) but remain listed and traded in the exchanges. Therefore, we compare firms that receive the "Special Treatment" ("ST") status in China with delisted firms in the US. During 2000-2018, 572 Chinese firms receive the "ST" status; many firms jettison this title after reemerging from restructuring a few years later, while 65 are *permanent* "ST" firms—they maintain the "ST" status till the end of our sample period. We find 2,550 firms delisted from US exchanges during the same period due to poor performance.

We compare permanent "ST" firms with the delisted US firms and define the year of delisting (in the US) or receiving the "ST" for the first time (in China) as Year 0. Figure 4 (with reported *t*-statistics on the differences between the two groups) shows that the ST firms perform significantly better than the US delisted firms during the [-5, -3] event window. But the ST firms' performance deteriorates rapidly, with the average ROA falling below 0 in Year -2 and have lower average ROA than that of the US delisted firms during the two years leading up to the ST/delisting year.[21] Put differently, if these ST Chinese firms were listed in the US, they would have been delisted given their path of precipitously declining performance.[22]

Hence, many more firms should have been delisted from the A share market. Poor performing firms are often kept alive, because investors prefer injecting assets and restructuring these firms to going through the lengthy and unpredictable IPO process. As shown in Liu et al. (2019) and Lee et al. (2023), the market values of the smallest firms (in terms of market cap) in the A share market include a significant component reflecting the potential to become 'shells' in reverse mergers. A listed firm can discard its "ST" status once it starts to make positive earnings after the reverse merger. The CSRC has tightened the requirements on the firms that seek to be listed through a reverse merger. Dropping all the ST firms from the sample would

[20] According to CRSP, firms in the US can be delisted from an exchange due to the following reasons: merger, moving to another exchange, liquidation, dropped by the exchange, ticker expiration and becoming foreign listed. We require that each firm have financial information starting for five consecutive years before the delisting date in the US, or the date receiving the "ST" status for the first time in China's A share market.

[21] Among the firms delisted from the US, those 78 headquartered in China perform worse (in terms of ROA) than the other firms. Lee, Li, and Zhang (2015) study a sample of 146 Chinese firms listed in the US through *reverse mergers* and find no evidence that they have worse performance than similar firms trading on the same exchange.

[22] The SSE announced, on March 21, 2016, the decision to terminate the listing status of ST *Boyuan* due to accounting frauds and disclosure of false information, and its failure in correcting this misconduct. This is the first case of forced delisting from either of the domestic exchanges since the inception of the equity market in 1990.

increase the BHRs of the (remaining) A share firms over 2000-2018, but it does not significantly shrink the gap in returns with other groups of listed firms (Figure IA6 and Table IA10 in the Internet Appendix).[23] Overall, we conclude that deficient IPO and delisting processes exacerbate the adverse selection of firms in the A share market.

Investment, Cash Flows and Corporate Governance

Another possible explanation for the poor performance of China's A share market is that corporate investment yields low returns after IPO. As noted above, we measure investment returns by net cash flows, or EBITDA – Change in Working Capital – Income Taxes – Capital Expenditure. We plot the scale of (weighted average) investment and net cash flows of A share firms and other groups of listed firms (by calendar year) in Figure 5. As Panel A shows, A share firms have the highest level of investment (capital expenditure scaled by total assets) among the group of large countries— with a value-weighted average of around 4.4% per year— as compared to firms listed in developed and other developing countries (the weighted average for the US is 4.2%, and 3.7% for India). Domestically listed firms also consistently invest more than their externally listed counterparts.

Panel B compares the value-weighted average (with year-end book assets as the weight) net cash flows generated by A share firms with that of other groups of listed firms over the sample period. For the entire period, the value-weighted average ratios of net cash flows over assets of A share firms, and listed firms from India and Brazil are 1.5%, 3.8%, and 2.8%, respectively. A share firms have lower net cash flows than those of externally listed Chinese firms, and listed firms from India and Brazil in most of the years. Starting in 2007, A share firms actually have the lowest level of net cash flows among the five large countries.[24] A share firms double the scale of their capital expenditure one year after the IPO (from 3% to 7% of total assets) and maintain at similarly high levels in subsequent years; they also experience a substantial drop in net cash flows over the same period. By contrast, firms from the other four countries and externally listed Chinese firms experience a much smaller increase in investment after the IPO and maintain higher levels of net cash flows as compared to A share firms.

In a multivariate, OLS regression setting, Table 7, Panel A shows that A share firms invest more than firms listed in other countries (by 0.55% of assets each year, and statistically

[23] In August 2011, the CSRC issued the "Decisions to revise the provisions of firms' asset restructuring and matching financing," which requires that the firm has to be in operation for at least three years and have made earnings no less than RMB 20 million in the most recent two consecutive fiscal years.

[24] Bai, Hsieh, and Song (2016) show that a portion of China's RMB 4 trillion stimulus implemented during 2008-2010 in response to the global financial crisis went to fund investment projects of large, listed firms, with local governments acting as the financing intermediaries.

significant at the 1% level; Column 1). Relative to the *mean* investment level (measured by the value-weighted capital expenditure-to-assets ratio) of firms from other countries (3.4%), A share firms invest 16.2% more annually than their counterparts. A share firms underperform firms from other countries in terms of net cash flows to total assets ratio by 0.77% per annum (Column 3, significant at the 1% level), or approximately 25.2% lower relative to the value-weighted average net cash flows of firms from the other countries (3.05%).

In Panel B, we present results comparing net cash flows of different subgroups of A share firms relative to listed firms from other countries. Most subsets of A share firms, including SOEs, non-SOEs, the largest firms and medium-sized and smallest firms, all underperform firms from other countries in terms of net cash flows, with the extent of the underperformance greatest for the largest firms (Column 5). Small firms, on the other hand, do not underperform listed firms from the other countries (the negative coefficient is the smallest in magnitude, and statistically insignificant, Column 4).

Table 7, Panel C compares the operating performance between A share firms and matched unlisted firms. As stated in Section II above, we find one matched unlisted firm for each of the 1,407 A share firms operating in manufacturing industries, while very large manufacturing firms and non-manufacturing firms do *not* have a matched unlisted firm. A share firms have higher levels of investment (by 2.2% of assets per year, significant at the 10% level), but significantly lower levels of operating cash flows (by 4.07% of assets, Column 2) and net cash flows (3.63% of assets, both significant at the 5% level). Given the (value-weighted) mean operating cash flows-to-assets ratio and net cash flows-to-assets ratio of 6.5% and 1.5%, respectively, for the A share firms, these differences are once again economically significant.[25]

Panel D compares the performance between A share firms and *matched* (by industry and size) externally listed firms. There is no significant difference in investment between the two groups of firms, while A share firms have higher operating and net cash flows than those of externally listed firms, but the differences are statistically insignificant. In Panels D1 through D3, we split the A share firms into three subgroups—large, medium and small (with lagged market cap as the sorting variable) and compare their performance with their counterparts. Large A share firms have higher investment and lower net cash flows than matched large externally listed firms (both significant at the 5% level; Panel D1), indicating investment

[25] We also find small- and medium-sized A share firms underperform their matched *unlisted* counterparts (see Table IA11 in the Internet Appendix) in terms of net cash flows. The same is true for large listed firms, but the coefficient is not statistically significant, possibly due to the fact that listed firms in financial services industry or really large listed firms (from all the industries) do not have a matched unlisted firm.

inefficiencies of these A share firms relative to those listed in external exchanges.

Medium A share firms also underperform their counterparts (higher investment and lower net cash flows), while small A share firms actually outperform small externally listed firms in terms of net cash flows. These results also illustrate heterogeneities among A share firms in terms of operating performance, and we will explore possible differences among these firms in terms of stock returns relative to other groups of firms below.

As indicated earlier, low net cash flows and investment efficiency reflect poor *shareholder* governance. Following prior literature (e.g., Gompers, Ishii, and Metrick, 2003; Cremers and Nair, 2005) we create a governance index for the cross-country sample of listed firms, which includes four distinct mechanisms: 1) a greater degree of ownership concentration, 2) higher degree of executive ownership, 3) a smaller board size, and 4) the CEO is also the Chairman of the Board ("CEO duality"), are all associated with stronger incentives for value creation by management, and a higher index value (G-Index-I) indicates better governance. Table 8, Panel A presents summary statistics of this index across 75 economies and markets.[26]

We also examine poor corporate governance in the form of tunneling by firms' controlling shareholders. We follow the literature and measure tunneling activities by the direction and amount of RPTs, with information coming from CSMAR, which provides the type, amount, direction and date of all such transactions of A share firms, based on CSRC's mandatory disclosure requirements. We use loan-based RPTs (e.g., Fisman and Wang, 2010), which involve cash transactions in and out of the listed firms, and construct *RPT Amount Out*, the aggregated money outflow from loan-based RPTs for each firm in each year. We scale this variable by the firm's book assets (of the same year). We then regress A share firms' investment and cash flows on the lagged (by one year) RPT variable. Results are presented in Internet Appendix Table IA12. RPT outflow adversely affects the scale of firms' investment, operating and net cash flows in the following year. A larger RPT cash outflow is also associated with lower stock returns in the following year, indicating that the market and investors are aware of its adverse effect on firms.

Following the recent literature on corporate governance in China (see, e.g., Jiang and Kim (2020), for a survey), we add two dimensions to create the A share governance index for

[26] For the literature on corporate boards, see Adams, Hermalin, and Weisbach (2010) for a review, for managerial ownership and performance, see, e.g., Coles et al. (2012). In addition, there are other dimensions of corporate governance with the goal of enhancing values of other (non-shareholder) stakeholders of listed firms. See, e.g., Allen, Carletti, and Marquez (2015), for a theoretical comparison between stakeholder- and shareholder-based governance mechanisms. Data for institutional ownership is not available for most emerging economies and is therefore not included in our governance index.

domestically listed firms: 1) lower level of state ownership, and 2) lower degree of insider 'tunneling,' which is based on the RPT variable, are both related to stronger governance; higher values of the "G-Index-A," which has 6 dimensions, indicate better governance. Table 8, Panel B presents summary statistics of this A share G index. Small cap firms, as a group, have higher G index than the large cap firms, while non-SOEs have higher governance scores than the SOEs. We also find that the value-weighted average score of the G-Index-I for A share firms is substantially lower than that for Hong Kong listed firms, and also lower than that of US firms and the average level of the other markets.

IV.2 Investor Biases and the Comparison of Different Factors

We construct three types of measures for investor behavioral biases. First, for the cross-country sample, we follow Baker, Wurgler and Yuan (2012) and construct two market-level investor sentiment measures. $Sentiment_1$ is constructed based on idiosyncratic risk premium (PVOL) and stock turnover (TURN), available for 58 countries; $Sentiment_2$ is constructed from an additional two components related to the number and return of IPOs [Ln (# IPO) and RIPO] in a given year, and is available for 17 countries.[27] We report the summary statistics of the sentiment measures and their components for China, Hong Kong, the US, and all the other countries as a group in Table 9, Panel A.

Second, we follow Jia, Wang, and Xiong (2017) and construct the monthly AH premium as a measure capturing A share investors' (optimistic) biases relative to investors based in HKEX. We calculate the price ratio of the A share stock and its H share-listed counterpart for 99 firms *dual*-listed in both the A and H share markets, and then take the value-weighted average across firms using the total market value of each pair's A and H shares as the weight.[28] Table 9, Panel B reports the summary statistics of the market-level AH premium variable, similar to those reported in Jia et al (2017), which covers an earlier period. Prior literature (e.g., Mei, Scheinkman, and Xiong, 2009) also shows that the speculative motive of A share investors generates a speculative component in the A share prices, which is positively related to the A share turnover rate. Thus, we construct the third investor behavior measure, the individual stock-level turnover for A share firms, and report its summary statistics in Panel B.

[27] We have the annual number of IPOs and IPO first-day returns data for 17 economies: China, the US, Japan, the UK, Canada, Australia, France, Italy, Germany, South Korea, Hong Kong, Singapore, Brazil, Taiwan, Thailand, Malaysia, and Indonesia. PVOL is the log ratio of the equal-weighted average M/B ratios of stocks with high idiosyncratic volatility and those with low volatility (as determined by the 30th and 70th percentiles of the distribution of the volatility variable). TURN is the detrended log turnover over the year.

[28] We compare the time-series of AH premium that we construct with the Hang Seng Stock Connect China AH Premium Index, and find they tracked each other closely during 2016-2020 (Figure IA7 in the Internet Appendix).

Comparisons between Institutional Factors and Investor Behavioral Factors

We have shown (recall Tables 5-7, Figures 4-5) that the institutional deficiencies hypothesis—problematic IPO and delisting mechanisms, low investment efficiency and tunneling by controlling shareholders—can explain why A share firms have lower net cash flows than firms listed in other large countries, externally listed and matched unlisted Chinese firms. Some of the results are also consistent with the investor biases hypothesis, in that A share investors fail to fully apprehend earnings management activities around IPOs, quality of investment decisions, and inefficiencies during the delisting process, so that the pricing of IPO stocks, poorly governed and 'ST' firms is irrational, leading to lower subsequent returns. The investor sentiment indexes can also explain the gap in stock returns between A share firms and other groups of listed firms. We now run a set of regressions pooling these two sets of factors together to measure and compare their quantitative impact in explaining differences in stock returns of firms listed in the A share and other markets.

We regress annual stock returns on: (i) the G index (for the cross-country sample); (ii) inefficiency in the IPO process as measured by the change in ROA around IPO (in the [-1, +1] window, recall Table 5); (iii) the two investor sentiment variables (at market level); among the A share firms, we also include, (iv) the A share G index that also includes tunneling as measured by RPT outflow and the size of the state ownership stake, (v) two new variables measuring investor biases, the AH Premium and stock-level turnover. To ease comparisons, we standardize the coefficients of all the *continuous* variables (investor sentiment variables, change in ROA, etc.) through scaling the raw values by the standard deviations of the variables. To be consistent with Table 2, we continue to use WLS regressions, with stock returns in *percentage points* as the dependent variable and include (but do not report) firm controls.

As another measure for firms' investment efficiency, we follow Qian and Zhu (2018) and introduce firms' return on invested capital (ROIC), defined as net operating profits (net income adding after tax interest expenses) scaled by (lagged) invested capital (= long-term debt + minority interests + preferred equity + common equity). While net cash flows offer a *cash flow*-based metric of returns on investment (scaled by assets), ROIC is based on how much *net profits* are earned for a given level of debt and equity capital raised. Since both net cash flows and ROIC can be regarded as 'outcomes' of the governance variables, we include these variables (in standardized form, and only report ROIC in Table 10) in the 'reduced form' regression models of stock returns as controls and see whether their presence would alter the impact of the other 'exogenous' factors (governance, IPO process, sentiment) on future returns.

Table 10, Panel A reports results from cross-country regressions. Firms with stronger

shareholder governance have higher future returns (Column 1). Higher investor sentiment predicts lower stock returns in the following year (Columns 2 and 3), consistent with the results in Baker, Wurgler, and Yuan (2012), that sentiment is a contrarian predictor of country-level market returns. There is also a positive relation between a firm's earnings change around IPO and its stock returns (Column 4), indicating that firms with a larger drop in ROA tend to have lower (subsequent) returns.

When we include multiple sets of the factors, we find that the investor sentiment factor is of first-order importance for stock returns of listed firms around the globe. For instance, a one standard deviation increase in $Sentiment_1$ (based on volatility and turnover) is associated with a 4.40 percentage points drop in returns (Column 5), while a one standard deviation increase in $Sentiment_2$ (based on volatility, turnover and IPO activities) is associated with a 6.78 percentage points fall in returns (Column 8). An increase in the governance index and a decrease in the drop in ROA around IPO are also positive determinants for stock returns. For instance, from Column 8, a one-point increase in the G-Index-I (the standard deviation of this variable is 0.947 for the cross-country sample) is associated with a 1.63 percentage points increase in annual stock returns (significant at 1% level), when the other factors and ROIC are included.

Table 10, Panel B examines stock returns of the A share sample. Based on Column 6, a one-point increase in the A share G index (the standard deviation of this variable is 1.096 for the A share sample, as reported in Table 8, Panel B) is associated with a 1.36 percentage points increase in annual stock returns, while a one standard deviation increase in stock-level turnover (2.38) is associated with a 1.62 percentage points drop in returns. Column 2 shows that the AH premium, a sentiment measure which varies by industry and by year, is associated with lower stock returns, but its explanatory power weakened substantially when G-Index-A enters the model and when year fixed effects are controlled for (Column 5). The magnitude of the impact of the drop in ROA around IPO becomes much smaller when G-Index-A and the stock-level turnover are included (Column 7). Overall, these results show that both corporate governance and the investor sentiment factors are important determinants of annual stock returns for A share firms. Finally, the relationship between ROIC, which measures investment efficiency, and stock returns is positive and statistically significant in both panels (Column 8), but its presence does not diminish the effects of the institutional and behavioral factors.

For robustness, we rerun the cross-country tests in Table 10, Panel A, using both a portfolio-sorting approach (double sorting on the governance index and the $Sentiment_1$ variable) and *portfolio* regressions (including both sentiment variables, and controlling for the Fama-

French five factors and country and firm controls); see Tables IA13-14 in the Internet Appendix. For the A share sample and tests reported in Table 10, Panel B, we also use *monthly* returns to conduct the portfolio sorting method, and an alternative AH premium measure to run the cross-sectional regressions.[29] We continue to find that the governance and sentiment factors are key determinants of returns in both the cross-country sample and within the A share firm sample.

Next, we follow prior literature (e.g., Core, Guay, and Rusticus, 2006) and examine whether the governance indexes can explain variations in accounting performance of listed firms. In Table 11, Panel A, higher values of G-Index-I are associated with higher investment, operating cash flows and net cash flows (coefficients all significant at the 1% level) in the cross-country sample. In Panel B, we drop the largest 30% of A share firms from the sample. The positive relationships between the cross-country governance index and investment, operating and net cash flows remain strong, but the underperformance of A share firms in cash flows becomes weaker and statistically insignificant. These results confirm that the inferior accounting returns of A share firms is mainly attributed to large firms. In Panel C, an increase in the value of G-Index-A is associated with higher levels of investment and operating cash flows (significant at 1%) for A share firms. It is also associated with higher levels of net cash flows for the whole sample period, but the result is statistically insignificant (Column 3). The coefficient on the G index becomes statistically significant (at the 10% level, Column 4) in regressions conducted on the *second* half of the sample period, in which the gap between small and large firms in governance is greater (results shown in Figure IA8 of the Internet Appendix).

The implications from Tables 10 and 11 are that both institutional deficiency factors and investor behavior factors are important determinants of stock returns. Among institutional features, firms' governance is of particular importance in explaining low stock returns of A share firms, and it is also important for raising firms' accounting performance. Hence, enhancing governance has a positive effect on the performance of A share listed firms. Further improvement of the structure of the investor base in the market is also critical in terms of reducing the adverse effects of investor biases on stock returns. In this regard, encouraging more domestic and foreign institutional investors to actively engage in corporate governance, including monitoring investment and other key firm activities, can be the solution to both goals.

IV.3 Evidence Concerning the Financial Repression Hypothesis

[29] We use abnormal turnover and residual AH premium as alternative measures for investors' behavioral biases. We report the results in Internet Appendix Tables IA15 and IA16. We also run OLS regressions (on the same sample as that used in Table IA1, Panel E, in the Internet Appendix) to estimate the same specifications as those reported in Table 10, and find qualitatively similar results (see Table IA15, Panels B and C).

To examine the financial repression hypothesis, we extract real interest rates for the largest 20 economies as measured by 2018 GDP in PPP terms from the IMF. From Table IA17 in the Internet Appendix, we find that real interest rates in China over the sample period (2000-2018) are substantially lower than those in large emerging markets, such as Brazil and India, and are lower than emerging markets as a group (difference in means are significant at 1%). The average real rates in China are also lower than those in the developed markets, including the US, Japan, and Hong Kong, but the differences are not statistically significant. To the extent that the opportunity cost of capital (as proxied by the real rates) has been much lower in China than in other large emerging markets over the past two decades, this can also explain why stock returns have been lower in the A share market according to Proposition 3.

Matched unlisted Chinese firms and externally listed firms in the US and Hong Kong operate in environments with similar levels of low real opportunity costs as A share firms but have generated much higher levels of net cash flows (matched unlisted firms) and stock returns (externally listed firms). These comparisons indicate that while low interest rates are consistent with low stock returns in the A share market as compared to firms from other emerging markets, they cannot fully explain why externally listed firms have generated higher stock returns, or the poor accounting performance of A share firms relative to matched unlisted firms.

IV.4 Additional Tests, Robustness Checks, and Discussion of Results

In this section, we first explore heterogeneities across the A share firms and decompose the underperformance in stock returns of A share firms by examining different subsamples. Table 12 presents the results from these tests.

Further Exploring Heterogeneities within the A share Sample

Recall from Table 2, Panel D, Table 7, Panel B, and Table 11, Panel B, we find that the underperformance of A share firms in both stock and accounting returns is concentrated among large cap firms. In Panel A, Table 12, we include both the large and SOE indicators in the A share sample and continue to find that large firms underperform other A share firms both in stock returns and net cash flows. While SOEs also underperform non-SOEs in terms of stock returns (Column 1), their accounting performance is no different from non-SOEs (coefficients in the cash flow regressions are both positive but statistically insignificant). In fact, the gap between large firms and small- and medium-sized A share firms in net cash flows is significantly greater than that between SOEs and non-SOEs (the difference between the coefficients of the indicators is significant at 1%); the large-firm gap in stock returns is also greater than that of the SOE gap, but the difference is not statistically significant.

The return gap between large and small A share firms grows much larger during the second half of the sample period (Figure 2); the gap in G-index-A for the two groups also widens between 2005 and 2018 (Figure IA8 in the Internet Appendix).[30] These results indicate that greater improvement in governance of small firms following the Split-share Reform contributes to the larger return gap between large and small firms during 2009-2018, thus providing more direct evidence in support of Proposition 1.

An alternative hypothesis explaining the return gap between large and small A share firms is that investors' degree of biases toward large firms is greater, thus leading to lower returns of large stocks. Interestingly, stock-level turnover, our measure of investor sentiment, is higher for the small stocks, but they have higher returns. In Table IA18, Panel B of the Internet Appendix, the large indicator remains negative and statistically significant after controlling for turnover (in the return regressions of A share firms). This result suggests that sentiment alone cannot explain the underperformance of these stocks, while G-Index-A remains positive and significant in all the models, suggesting that governance is a key factor.

Next, we divide the A share sample into newly listed firms (conducting IPO within a two-year window), incumbent firms (conducting IPO two years before or earlier, and not in ST status), and ST firms, and estimate their relative contribution to the performance gaps in returns. We allow each group of firms to enter the cross-country regressions and derive the changes in regression coefficients. Results are summarized in Table 12, Panels B and C. For instance, when only incumbent SOEs enter the regression, the coefficient of the A share indicator is –7.6 (Column 2 in Panel B; significant at 5%), meaning that this subset of firms underperforms those listed in other countries by 7.6 percentage points per year. With newly listed and ST firms added to the SOE subsample, the underperformance increased to 9.91 and 12.78 percentage points. Taking the differences of these coefficients, we then interpret the relative contribution of incumbent, newly listed, and ST SOEs to the underperformance of all the SOEs to be 59.45%, 18.11%, and 22.44% (Column 4 in Panel C), respectively, with the incumbent firms taking the lion's share. Using the same approach, we conclude that the incumbent firms also contribute nearly half of the performance gap of all A share firms (Column 2, Panel C), while newly listed non-SOEs contribute a significant share (37.6%, in Column 6) to the underperformance of all the non-SOEs, (in part) due to more inflated pricing of IPO stocks.[31]

[30] From Table IA 18, Panel A in the Internet Appendix, the difference in the average values of G-index-A between the large and small firms in 2004 was 0.069 (statistically insignificant), while it increased to 0.375 by the end of 2007 (significant at 1%), when the SSR was completed. Small firms thus emerged from the SSR with better governance than large firms.

[31] Table IA19 in the Internet Appendix shows that the decomposition results are similar for the 1991-2018 period.

We have examined reasons for why the A share listed firms underperform listed firms from advanced and emerging markets as well as externally listed and matched unlisted Chinese firms, both in terms of stock returns and firms' net cash flows. There are also a number of alternative factors that can perhaps explain the low returns of A share listed firms relative to the other groups of listed firms. We briefly discuss some of these factors.

Firms' Discount Rates

We have shown that low *real* interest rates during the sample period can (partially) explain the return gap between A share firms and firms from other emerging markets. Another possible explanation of the low stock returns, especially since 2007, is that interest rates may have been *rising* in China. First, in terms of *risk-free* rates (bank deposit rates and rates of government bonds), the real demand deposit rate (adjusted for inflation) and one-year deposit rate both declined from 2000 to 2018; the 5-year deposit rate did not increase over the years either. Meanwhile, real interest rates of the 5-year government bonds for China are higher than those in Japan for most of the sample period; they seem to be in line with those of the US and India.

We next examine whether changes in discount rates of the listed firms due to changes in the *risk premium* have contributed to low returns. To do this, we take advantage of a subset of A share firms that are *cross-listed* in external markets; part of these firms' financing is from external markets with possibly different levels of risk premia and overall discount rates.[32] We identify 99 firms listed in both the A share and Hong Kong markets in our sample, and compare the performance of these cross-listed firms with firms listed in the A share market only. Panels A and B of Table 13 show that the cross-listed firms are not significantly different from the matched firms that are *only* listed in the A share markets in terms of: (i) RPTs, as measured by cash outflow from loan-based transactions; and (ii) stock returns; Panel B shows that cross-listed firms generate similar levels of net cash flows as non-cross-listed firms.

Overall, the fact that cross-listed firms have similar net cash flows and stock returns from matched, non-cross-listed A share firms suggests that cross-listed Chinese firms face similar discount rates as non-cross-listed A share firms. This result also casts doubt on the prediction that the underperformance of A share firms can be explained by higher (risky) discount rates.

Risk as Measured by Stock Betas and Return Volatilities

A key prediction of efficient markets is that stocks with lower risks should have lower expected returns. Lower risks can be proxied by lower stock betas; that is, compared with

[32] Carpenter et al. (2021) find that Chinese investors require a higher cost of capital than US investors, due to relatively higher degrees of economic risks, fewer diversification opportunities, and capital controls.

externally listed Chinese firms, A share firms may have lower betas. We use the value-weighted returns of all A share firms as the A share's *market* returns. For externally listed Chinese firms, we use the value-weighted returns of all the firms in the listing country or exchange as the market returns—for instance, we estimate betas of Chinese firms listed in the HKEX (the US) by using the value-weighted returns of all the listed firms in Hong Kong (the US) as the market portfolio.[33] Internet Appendix Table IA20 reports the average betas by industry. The differences in betas for A share and externally listed firms are statistically indistinguishable for most of the industries, except for the consumer services industry, which accounts for less than 10% of all the stocks. The fact that the stock return betas of most A share firms are similar to those of externally listed firms suggests that the outperformance of externally listed Chinese firms is not explained by higher betas.

We control for return volatilities in the stock return regressions (Table 2), and find that the underperformance of the A share market remains. Despite having daily limits on price movements, a value-weighted portfolio composed of Chinese stocks has higher return volatilities as compared to stocks from both developed and developing markets (Figure IA9 in the Internet Appendix). A share stocks also have higher return volatilities than those of externally listed Chinese firms for the majority of the sample period.[34] Thus, lower returns associated with lower risks as predicted by standard asset pricing theories is inconsistent with what has happened in the A share market.

Valuation

If investors in the A share market become more pessimistic about the stocks than investors in the other markets, returns of A share stocks, especially during the second half of the sample period, could be lower due to (revised) lower valuation. Bekaert, Ke, and Zhang (2021) document that in the post-2000 era, the price-to-earnings (P/E) ratios for A share stocks peaked in 2007 and declined in subsequent years, but their valuation during subsequent years is not at the bottom of the emerging market group consisting of India, Brazil, and other countries. Bekaert et al. (2021) find that they are also higher than the average P/E ratios for Datastream

[33] This approach is consistent with how funds flow in the Shanghai- and Shenzhen-Hong Kong Stock Connects. For "south bound" domestic investors, their funds (after converting from RMB into HK dollars) are pooled with capital in HKEX; once the trades are cleared and settled, these investors can retrieve their funds (in RMB). A similar approach is taken for "north bound" foreign investors (with foreign funds pooled with domestic capital). For more details, see http://www.sse.com.cn/lawandrules/sserules/hkexsc/c/c_20190228_4728030.shtml.

[34] Brunnermeier, Sockin, and Xiong (2021) theoretically examine the Chinese government's intervention in the stock market with the goals of reducing volatilities and improving resource allocation. In their model, since investors spend resources to gather information on government policies, they ignore fundamentals in the stocks in the process and government intervention can achieve the exact opposite outcomes relative to its intended goals.

market indices of emerging markets and developed markets. Our own calculations show that A share stocks' valuation (as measured by M/B ratios) is also higher than that of externally listed Chinese stocks during most of the post-2007 period (Figure IA10 in the Internet Appendix). This indicates that the poor performance of A share stocks is not explained by investors giving low valuation to these firms.

V. CONCLUSION

During 2000-2018, China's domestic (A share) stock market, the second largest in the world in terms of market capitalization, is one of the worst performing markets in terms of buy-and-hold returns. By contrast, externally listed Chinese firms, most of which are listed in Hong Kong and the US, perform much better. The operating performance of A share listed firms, as measured by net cash flows, is also inferior to matched unlisted Chinese firms. The underperformance of A share firms is concentrated among large cap companies.

Understanding the factors that can explain the performance gaps, as measured in both stock and accounting returns, between the A share and externally listed and matched unlisted Chinese firms, as well as listed firms from developed and emerging markets, is the central goal of our paper. The answers to these questions should help regulators to improve the efficiency and performance of the Chinese stock market. A developed stock market promotes efficient allocation of resources in the economy, and allows better sharing of risks, which is important for a country in which firms heavily rely on bank financing. It is also crucial to allow the aging population to save effectively for their old age. Finally, an efficient stock market encourages innovation and promotes the development of new industries (Allen and Gale, 2000).

We first develop a model in which institutional and corporate governance reforms for the A share market would lead to permanently higher growth rates of cash flows for the representative firm. Risk neutral investors can have homogenous or heterogeneous beliefs on the prospect of such reforms. Once the reforms occur, the prices rise, and returns are equal to the opportunity cost of capital. We form two hypotheses based on different versions of the model. The "institutional deficiencies hypothesis" stipulates that as long as fully rational investors do not witness the announcement and implementation of the reforms, stock returns fall below the opportunity cost of capital in the current period. By calibrating the model with cash flows and growth data for the A share and externally listed firms during the sample period, we demonstrate that the "leap" in returns and valuation after the reforms can be sizeable.

Second, with heterogeneous investor beliefs on the prospect of the reforms, we show that

when the *optimistic* investors, facing short sale constraints, hold all the stocks of the representative firm, current period returns are lower the more optimistic they are about the *ex ante* likelihood of the reforms. Hence, the "investor behavioral biases" hypothesis states that low returns are driven by optimistic investors' irrational expectations of the reforms.

Firm-level evidence is consistent with the notion that problematic IPO and delisting processes lead to adverse selection of firms entering and staying in the market. With much higher levels of investment compared to listed firms from other countries, A share listed firms generate lower net cash flows, indicating low investment efficiency. These results are consistent with the institutional deficiencies hypothesis, in that reforms in market institutions and corporate governance would improve listed firms' performance. These results are also consistent with the investor biases hypothesis, in that investors fail to see through inefficiencies in investment, activities around IPOs and during the delisting process, so that the pricing of poorly governed firms is inflated, leading to lower subsequent returns.

When we include both institutional deficiencies and investor sentiment factors in tests of returns, we find that (market-level) sentiment is the most dominant factor in explaining the underperformance of A share stocks in the cross-country sample, while the cross-country governance index is another key factor. Within the A share sample, both the A share governance index and (stock-level) sentiment are important factors in explaining the variations of returns. Moreover, the global governance index can explain the performance gap in net cash flows of the A share firms relative to those from other countries, and the A share governance index also can explain differences in accounting performance among A share firms, as well as the gaps between large and small firms in both stock and accounting returns.

Our main policy implication is that the CSRC should substantially lower the financial hurdles for IPOs and encourage more privately-owned firms, especially those from growth industries, to enter the market. The CSRC should also tighten the process of delisting poor-performing firms. These features are reflected in the recently established "Science and Technology Innovation Board" in the SSE and have been expanded to other sectors of the A share market. These reforms should improve the quality of the mix of firms listed in the market. Most importantly, continuing efforts in improving the structure of the investor base and corporate governance are also needed in order to improve investment efficiency and "rational" pricing of stocks. Overall, these reforms will enhance the efficiency of the domestic stock market, and with the market playing a better role in allocating resources, they will also spur further growth in the overall economy.

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Figure 1. Buy-and-Hold Monthly Returns of Stocks Listed in Large Countries and Externally Listed Chinese Companies (2000-2018)

This figure plots the value-weighted, buy-and-hold returns (BHR) of the stocks listed in the markets of China (A share), the US, India, Brazil, Japan, externally listed Chinese firms, and the 30% smallest A share firms. The BHRs are calculated by accumulating value-weighted *monthly* returns of all the stocks listed in the country with the lagged-one-year market capitalization as the weight. For externally listed Chinese firms, the weight is the lagged-one-year market capitalization in US dollars. The returns are calculated at month-end, adjusted for stock splits and include cash dividends. Nominal returns are denominated in local currencies and adjusted for local inflation to convert to real returns. Inflation is measured by the month-average CPI rate of the listing country. The number of unique firms to make the plot for China, the US, India, Brazil, Japan, and Externally Listed Chinese Firms is 3695, 12200, 4819, 535, 4648, 1770, and 2178, respectively.

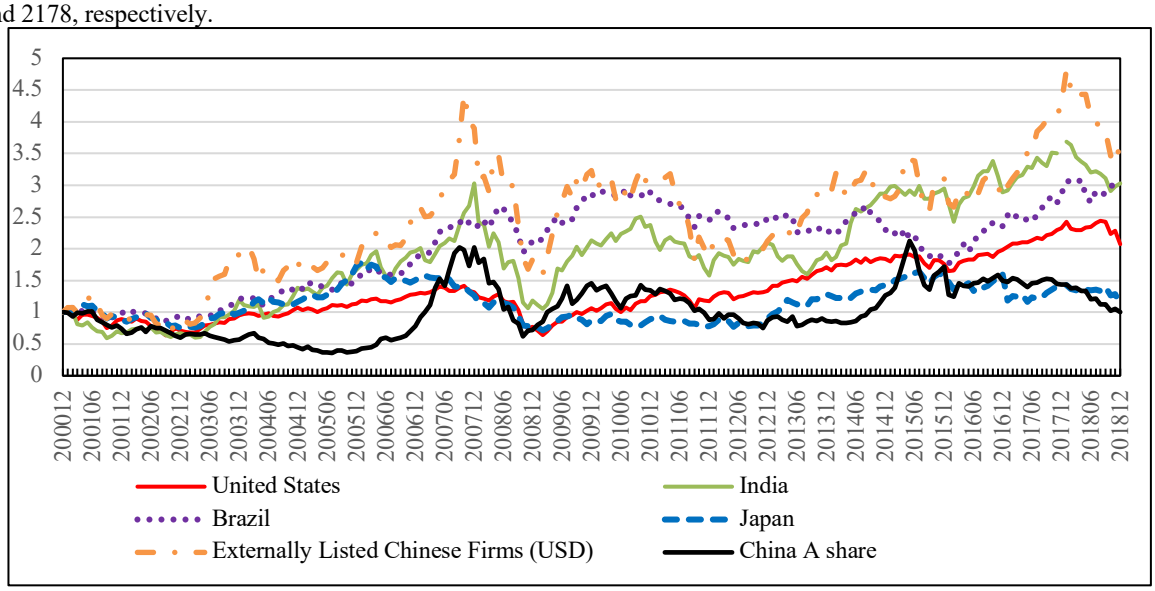


Figure 2. Buy-and-Hold Monthly Returns of Large, Medium, and Small Cap Stocks Listed in the A share Market

This figure plots the value-weighted average buy-and-hold returns of small, medium, and large A share firms and externally listed Chinese firms, with the lagged-one-year-market capitalization as the weight. Small and large firms are determined by the 30th and 70th percentile points in the lagged-one-year market capitalization by year.

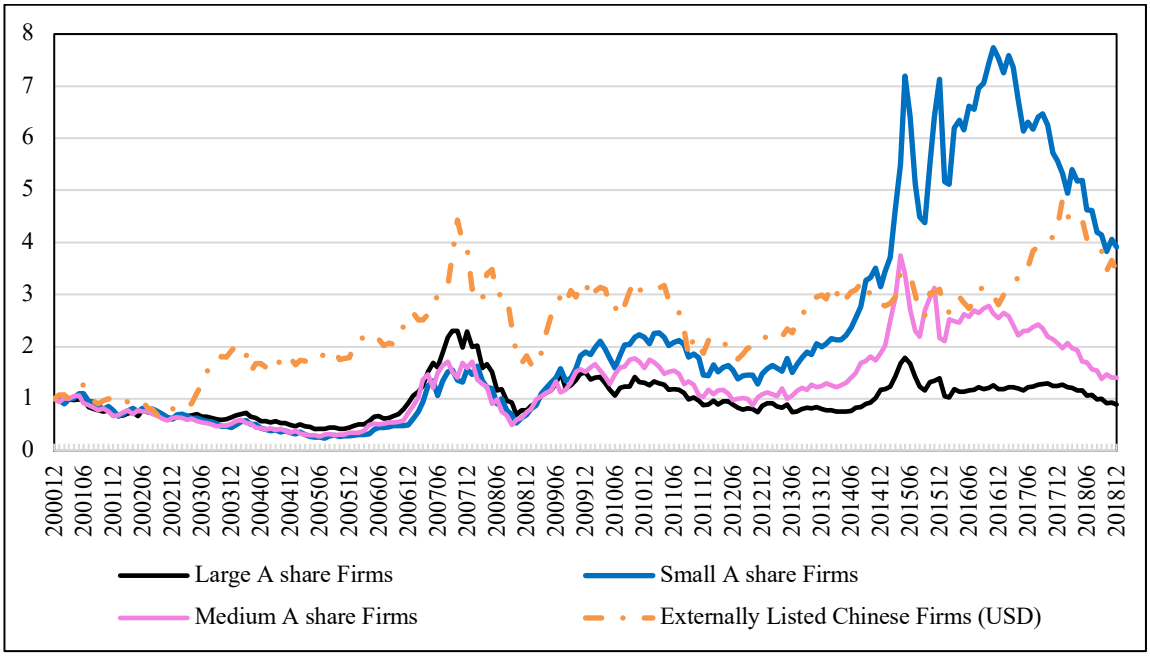


Figure 3. Timeline of the Model

This figure plots the timeline of our model, which has an infinite number of discrete periods. Market-wide institutional and corporate governance reforms are implemented with probability π in each period. The firm's cash flows just before time t, CL_t, is drawn from a distribution with mean ECL_t, and is paid to shareholders. If the reforms are announced and implemented at t, then the growth rate of cash flows between t and t+1 is g_H, so $ECH_{t+1} = ECL_{t+1}(1 + g_H)$, and the growth rate remains at g_H in perpetuity. If no reforms are announced at t, the growth rate remains at g_L, $ECL_{t+1} = ECL_{t+1}(1 + g_L)$, and there is again an announcement about comprehensive reforms at t+1. The process then repeats itself until reforms are eventually implemented.

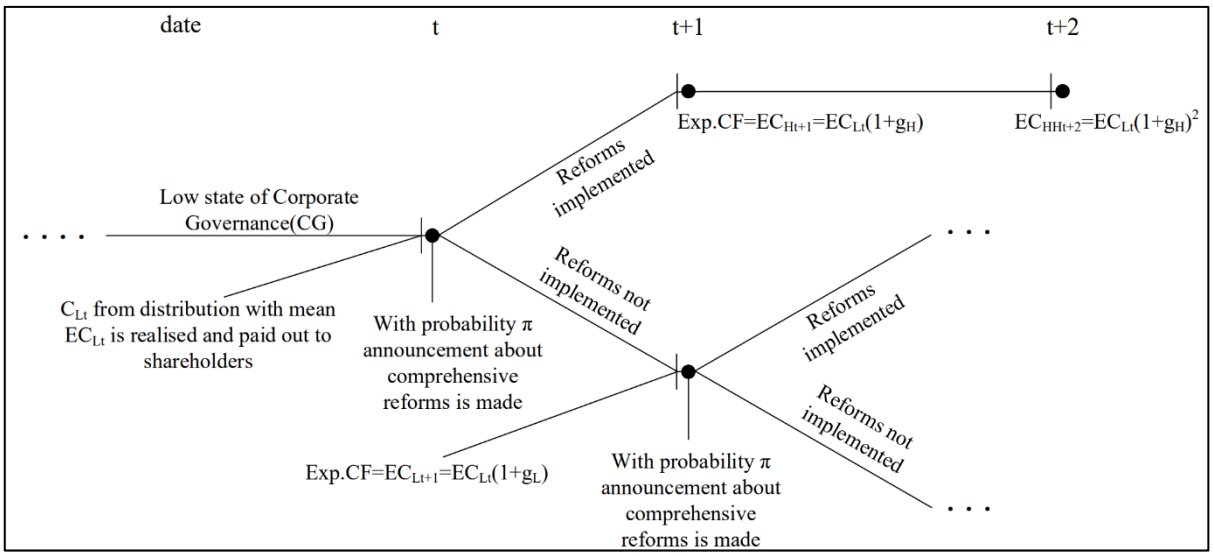


Figure 4. Operating Performance of China's "ST" Firms and Delisted Firms in the US

This figure plots the operating performance of (permanent ST) A share listed firms in the [-5,0] year window before receiving the "special treatment" ("ST") status for the first time, and operating performance of the US firms in the same event window before being delisted from the exchanges. Year 0 denotes the year when a firm receives the ST status (A share firms) or the year of delisting for US-listed firms. Operating performance is measured by ROA, weighted averaged across firms with the lagged-one-year total assets as the weight. *t*-statistics of the difference in ROA of the A share and US firms are reported for each window year.

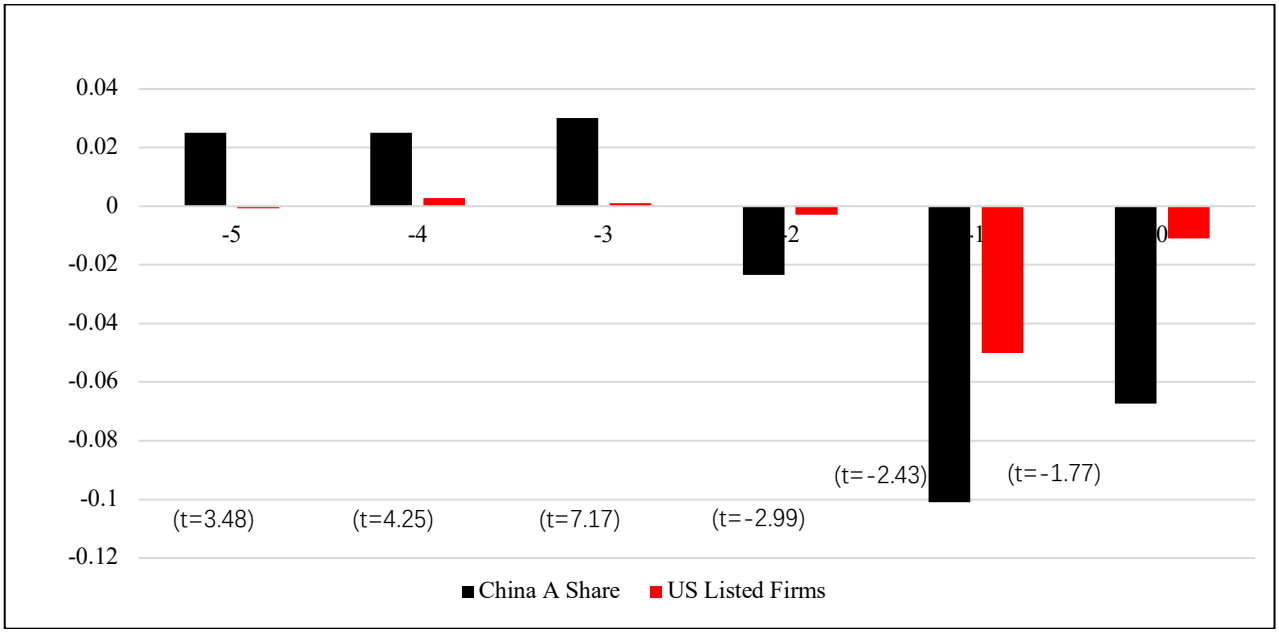
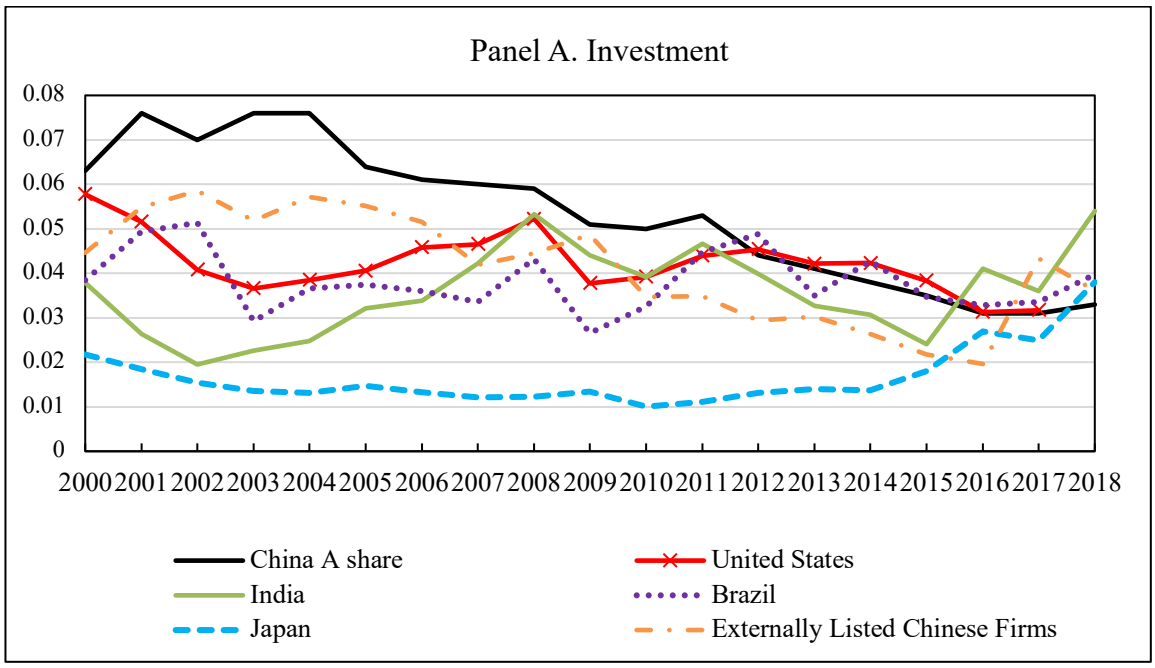


Figure 5. Investment and Net Cash Flows of A Share Firms, Externally Listed Chinese Firms, and Firms from Other Large Countries

This figure plots the weighted average investment and net cash flows of A share listed firms, firms listed in other large countries, and externally listed Chinese firms by calendar years. Panel A plots the weighted average investment of listed firms. *Investment* is measured by capital expenditure in year *t* scaled by the book assets in the same year. Panel B plots the weighted average net cash flows of listed firms. *Net Cash Flow* is calculated as (EBITDA – Change in Working Capital – Income Taxes – Capital Expenditure)/Total Assets. Both the investment and net cash flow measures are (weighted) averaged across firms with the year-end total assets as the weights. The sample is restricted to firms that have non-missing data on investment, net cash flows, and book assets. The number of unique firms that enter the plot for China, US, India, Brazil, Japan, and Chinese firms listed externally is 3695, 10529, 3708, 321, 4183 and 1487, respectively.



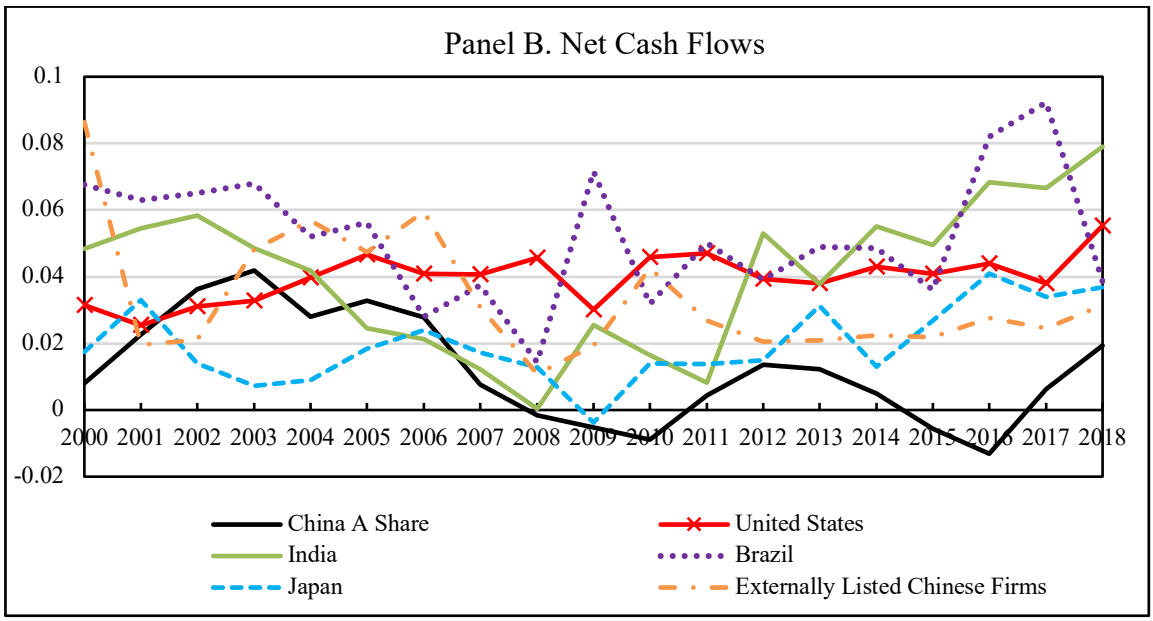


Table 1. The Distributions of Firms Listed in China and Other Countries by Year

This table presents the distributions of our sample firms listed in China's A share market, externally listed Chinese firms, and firms listed in other countries/markets over each year of the sample period. Panel A shows the distributions of A share firms (listed in the Shanghai and Shenzhen exchanges) and externally listed Chinese firms (firms headquartered in mainland China and listed in external markets, including Hong Kong, the US, Singapore, and other foreign exchanges). Columns 2 and 5 report the number of A share state-owned firms (SOEs) and the number of externally listed Chinese SOEs. The state ownership information is extracted from WIND under the data item "ultimate controller." We define firms ultimately controlled by central SASAC (State-owned Assets Supervision and Administration Commission of the State Council), Ministry of Finance, local SASAC, and other government agencies as SOEs. Columns 3 and 6 report the average book assets (in $billion) of A share firms and that of externally listed Chinese firms, respectively. See Appendix B for the detailed procedure that we use to identify externally listed Chinese firms from various data sources. Panel B presents the number of externally listed Chinese firms by the listing country/region. Panel C presents the number of firms listed in other large countries by year, including the US, India, and all the other countries covered in our sample as a group. Total assets are winsorized at 1% and 99%.

Panel A. Number of A Share Listed Firms and Externally Listed Chinese Firms

	A Share Listed Firms			Externally Listed Chinese Firms		
Year	# Listed Firms	# of Listed SOEs	Average Assets ($ Billion)	# Listed Firms	# of Listed SOEs	Average Assets ($ Billion)
	(1)	(2)	(3)	(4)	(5)	(6)
2000	1062	744	0.24	306	172	4.41
2001	1143	751	0.32	355	203	5.50
2002	1205	816	0.42	405	227	6.59
2003	1267	820	0.50	463	247	2.34
2004	1356	821	0.52	533	268	2.28
2005	1352	784	0.57	637	282	3.77
2006	1435	813	0.72	749	311	5.11
2007	1548	834	1.19	870	328	5.53
2008	1603	843	1.37	943	337	5.41
2009	1751	865	1.58	1002	348	5.56
2010	2106	903	1.62	1053	372	7.36
2011	2341	901	1.72	1065	387	9.01
2012	2470	927	1.82	1089	401	9.46
2013	2515	926	2.02	1124	418	10.30
2014	2632	879	2.21	1167	439	11.18
2015	2823	1081	2.38	1219	439	11.46
2016	3118	1103	2.50	1256	482	12.32
2017	3495	1150	2.46	1267	438	11.69
2018	3591	1078	2.78	1336	438	10.61
# of Unique Firms and Average Total Assets						
	3,695	1372	1.59	1,770	490	8.35

Panel B. Summary of Externally Listed Chinese Firms

	Hong Kong		United States		Singapore		Others	
Year	# of Firms	Average Assets ($ Billion)	# of Firms	Average Assets ($ Billion)	# of Firms	Average Assets ($ Billion)	# of Firms	Average Assets ($ Billion)
2000	245	0.10	55	2.79	2	2.20	4	22.20
2001	286	0.89	62	3.11	3	1.73	4	22.74
2002	326	1.26	70	3.32	5	0.90	4	24.67
2003	363	1.42	83	3.58	10	0.95	7	14.26
2004	402	1.76	98	3.87	20	0.70	10	12.79
2005	439	2.88	148	3.06	34	0.65	11	11.54
2006	479	4.67	183	2.98	61	0.83	17	9.71
2007	531	5.51	235	2.70	74	1.38	20	11.32
2008	547	5.93	294	2.26	73	1.67	19	10.77
2009	590	6.72	308	2.51	74	1.89	20	9.91
2010	657	6.57	294	3.10	70	2.54	22	10.31
2011	700	8.07	269	4.11	64	3.51	22	11.68
2012	743	8.38	254	4.68	61	4.10	21	12.87
2013	797	9.08	238	5.27	59	4.77	20	14.84
2014	862	9.74	220	6.09	59	5.23	16	22.65
2015	931	10.17	212	6.43	51	3.48	16	22.73
2016	975	11.21	208	6.53	49	3.83	15	22.11
2017	1015	12.69	191	7.75	40	4.66	12	30.23
2018	1109	11.22	227	8.01	n/a	n/a	n/a	n/a
# of Unique Firms and Average Total Assets								
	1,138	7.76	515	2.70	83	2.81	34	14.93

Panel C. Summary of Firms Listed in Other Large Countries

	United States		India		Others	
Year	# of Firms	Average Assets ($ Billion)	# of Firms	Average Assets ($ Billion)	# of Firms	Average Assets ($ Billion)
2000	9996	3.72	419	0.76	32392	1.28
2001	9466	4.28	514	0.81	34926	1.07
2002	9149	4.82	736	0.86	35541	1.51
2003	8948	5.51	807	1.06	36656	2.72
2004	8832	5.88	904	1.15	38104	3.01
2005	8739	6.18	965	0.70	40412	3.47
2006	8584	6.61	1107	0.71	47311	4.07
2007	8332	7.14	1314	0.91	48893	5.24
2008	8122	7.07	1735	1.00	49349	5.74
2009	8032	7.63	2070	1.04	49469	6.16
2010	8052	8.18	2243	1.24	49430	6.53
2011	8099	8.52	2536	1.27	49479	6.92
2012	8553	9.06	2965	1.23	49609	7.39
2013	8700	9.34	3597	1.34	50052	7.60
2014	8499	9.57	3950	1.26	50392	7.74
2015	8197	9.66	3996	1.92	50650	7.87
2016	7964	10.23	4021	2.05	50601	8.30
2017	7784	10.76	4060	2.25	50689	8.64
2018	6665	10.8	4156	2.27	34688	8.48
# of Unique Firms and Average Total Assets						
	18,689	7.41	4,819	1.51	92,350	5.75

Table 2. Underperformance of the A Share Market: Stock Returns

This table examines stock performance of A share firms, firms listed in other countries and externally listed Chinese firms. The dependent variable is the *annual* stock returns in percentage points, including cash dividends and adjusted for stock splits and inflation. For firms that are delisted from an exchange, we set the delisting return (stock return in the year after the firm is delisted) to be -30%. In Panel A, the independent variable of interest is *A Share Listed*, a dummy taking the value of 1 if the stock is listed in SSE or SZSE, and zero otherwise. The coefficients of *GDP Growth*, *Market Turnover* and *EBIT of Listed Firms/GDP*, *Consumption Volatility* are multiplied by 100 when reported. In Panel B, the dummy variable of interest is *Externally Listed Chinese Firms*. In Panel C, we exclude returns in the IPO year (year 0) and year +1 from the regression sample. All control variables are lagged one year when entering the regressions. Exchanges that have fewer than 20 stocks in any given year are excluded from the sample. We control for year and industry fixed effects based on the Datastream level-2 industry classifications. Panel D reports cross-country regressions of stock returns: Column 1 includes all A share firms, Column 2 excludes A share SOEs, Column 3 excludes the largest 30% A share firms by lagged-one-year market capitalization, Column 4 (5) studies the smallest (largest) 30% A share firms only. We employ WLS regressions where we use the lagged-one-year market capitalization as the weight. *t*-statistics calculated using the standard errors clustered by industry and year are reported in the parentheses. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels.

Panel A. The Cross-country Sample

	1991-2018		2000-2018	
Variables	(1)	(2)	(3)	(4)
A Share Listed	-14.588***	-13.399***	-15.969***	-14.948**
	(-6.044)	(-4.732)	(-5.291)	(-2.389)
GDP Growth	1.548***	0.626*	0.465	0.535
	(6.533)	(1.744)	(1.399)	(1.322)
Log (GDP Per Capita)	-2.852***	-1.402	-1.968**	-1.967*
	(-2.598)	(-1.422)	(-2.119)	(-1.966)
M2/GDP	1.809	4.744**	1.663	5.848**
	(0.963)	(2.375)	(0.822)	(2.509)
Market Turnover	6.408**	3.059	1.091	2.518
	(2.311)	(1.402)	(0.522)	(1.106)
Credit from Financial Institutions/GDP	-1.879	-6.711**	0.528	-8.271**
	(-1.033)	(-2.093)	(0.168)	(-2.344)
EBIT of Listed Firms/GDP	-0.008	0.007	-0.029*	-0.032*
	(-0.552)	(0.625)	(-1.873)	(-1.809)
Consumption Volatility	-2.003*	-0.540	0.386	1.253
	(-1.833)	(-1.435)	(0.445)	(1.277)
Anti-self-dealing Index	-2.498	7.710**	5.494*	8.172**
	(-0.633)	(2.062)	(1.653)	(2.099)
Tax Evasion	-0.603	-0.812	-1.448	-1.170
	(-0.611)	(-0.822)	(-1.392)	(-1.052)
Time to Collect on a Bounced Check	1.354	3.583***	2.933**	2.781*
	(1.286)	(2.766)	(1.969)	(1.922)
Log (Total Assets)		0.006		-0.410
		(0.029)		(-1.577)
Leverage		5.381		8.209*
		(1.263)		(1.752)
ROA		30.767***		32.336***
		(4.088)		(4.011)
Log (1+ Firm Age)		-9.125***		-7.377***
		(-9.213)		(-8.452)
Sales Growth		-0.003		-0.005
		(-0.453)		(-0.698)
Return Volatility		5.077*		3.437
		(1.862)		(1.370)
Differences in coefs. of "A Share Listed" in **Panel A** and "Externally Listed Chinese Firms" in **Panel B**	-23.982***	-16.880***	-24.615***	-18.373***
Year and Industry FE	Yes	Yes	Yes	Yes
R-squared (%)	7.45	8.43	4.06	5.17
Observations	686,886	683,609	495,651	495,651

Panel B. Performance of Externally Listed Chinese Firms				
# of Unique Externally Listed Chinese Firms: 1,679				
	1991-2018		2000-2018	
Variables	(1)	(2)	(3)	(4)
Externally Listed Chinese Firms	9.394***	3.481	8.646	3.425
	(3.786)	(0.676)	(1.511)	(0.577)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Country Controls	Yes	Yes	Yes	Yes
Firm Controls	No	Yes	Yes	Yes
R-squared (%)	7.32	4.43	3.97	5.06
Observations	686,886	683,609	495,651	495,651

Panel C. Performance of Listed Firms: Excluding IPO Years				
	1991-2018		2000-2018	
Variables	(1)	(2)	(3)	(4)
A Share Listed	-12.832***		-7.324**	
	(-4.644)		(-1.990)	
Externally Listed Chinese Firms		3.836		3.934
		(1.277)		(1.033)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
Country Controls	Yes	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes	Yes
R-squared (%)	13.92	14.57	10.77	11.92
Observations	646,631	646,631	465,589	465,589
Differences in coefficients of "A Share Listed" in **Panel A** and **Panel C**	0.567		7.624	
Differences in coefficients of "A Share Listed" and "Externally Listed Chinese Firms"		-16.668**		-11.258**

Panel D. Stock Returns of A Share Firms: Alternative Samples					
	All Sample	Drop SOEs	Drop Large	Small Only	Large Only
Variable	(1)	(2)	(3)	(4)	(5)
A Share Listed	-14.948**	-12.746***	-10.102	2.221	-15.523***
	(-2.389)	(-3.634)	(-1.413)	(0.245)	(-2.603)
Country/Firm Controls	Yes	Yes	Yes	Yes	Yes
Year and Ind FE	Yes	Yes	Yes	Yes	Yes
R-squared (%)	5.81	5.01	5.08	5.07	4.95
Observations	495,651	486,426	486,176	476,668	475,292

Table 3. Correlations between (5-year) Stock Returns and Future GDP Growth Rates

This table reports the Pearson correlations between stock returns and future GDP growth rates for the largest 20 economies according to the 2018 IMF rankings of GDP in PPP terms. We also include South Africa as a large emerging economy. We estimate the correlation coefficients for the period 1991-2018, or for a period starting from the year (after 1991) when the stock returns data become available in our dataset and ending in 2018. The correlation is estimated using cumulative stock returns of a 5-year interval and the cumulative GDP growth in the *next* 5-year interval (so we obtain stock returns for years t to t+4, t+1 to t+5, and so forth, and GDP growth for years t+1 to t+5, t+2 to t+6, …), until the end of 2018, on a rolling basis. Country-level stock returns are calculated as the value-weighted returns of individual stocks listed in a country, with the lagged-one-year market capitalization as the weight. For South Korea and Iran, we estimate the correlation coefficients using the stock market indices (KOSPI Korea and TEPIX Iran). We calculate the value-weighted returns for externally listed Chinese firms and estimate their correlations with China's GDP growth rate in year t+1. The last 3 rows present results on the differences in the correlation coefficients of China A share firms vs. developed countries as a group, other emerging countries as a group, and externally listed Chinese firms as a group. We use the OECD Classification to define developed and emerging countries; emerging economies include China, Brazil, Russian Federation, India, Mexico, Indonesia, Turkey, Iran, Thailand, Saudi Arabia and South Africa.

IMF GDP (PPP) Ranking	Country	Sample Period	Correlation	*p*-value
1	China A Share	1991-2018	-0.013	0.637
2	United States	1991-2018	0.286***	0.001
3	India	1991-2018	0.185***	0.001
4	Japan	1991-2018	0.380*	0.072
5	Germany	1991-2018	0.532***	0.008
6	Russian Federation	1996-2018	0.386***	0.001
7	Indonesia	1991-2018	0.531**	0.011
8	Brazil	1995-2018	0.429***	0.001
9	United Kingdom	1991-2018	0.479**	0.029
10	France	1991-2018	0.587***	0.004
11	Italy	1991-2018	0.446*	0.072
12	Mexico	1991-2018	0.489**	0.013
13	Turkey	1991-2018	0.195	0.396
14	South Korea	1991-2018	0.366	0.147
15	Spain	1991-2018	0.600***	0.0032
16	Saudi Arabia	1995-2018	0.350**	0.035
17	Canada	1991-2018	0.521***	0.009
18	Iran	1997-2018	0.056	0.280
19	Thailand	1991-2018	0.469***	0.001
20	Australia	1991-2018	0.116	0.656
*	South Africa	1991-2018	0.656***	0.001
Externally Listed Chinese Firms		1998-2018	0.410**	0.024
HK Listed Chinese Firms		1998-2018	0.555**	0.048
Difference	Average Correlation	China	Other Groups – China	*p*-value
Developed	0.437***	-0.013	0.450***	0.001
Emerging	0.375***	-0.013	0.388***	0.001
Externally Listed Chinese	0.410**	-0.013	0.423**	0.015

Table 4. Model Calibration (the version with common beliefs)

This table presents calibration results based on the first version of the model (with common investor beliefs on the likelihood of institutional and governance reforms) and Proposition 1 of the paper. The probability of implementing the reforms, π, takes on three values 0.02, 0.05, and 0.1. EC_L is the mean cash flows when the institutions and corporate governance are in the low state. We normalize EC_L to be one. g_L is the growth rate of cash flows per period when institutions and governance are in a low state. g_H is the growth rate of cash flows between t and $t+1$ when the reforms are announced and implemented at t. We use annualized nominal stock returns of A share firms and externally listed Chinese firms during 2000-2018 to proxy for g_L and g_H. r is the opportunity cost of capital for funding the representative firm's risky project. V_{LH} and V_L represent firm value before and after the implementation of reforms, and $R_H - R_L$ represents the jump in returns investors can realize in the current period, when the announcement and implementation of the reforms occur.

Model Input	r = 0.12			r = 0.15		
π	0.02	0.05	0.10	0.02	0.05	0.10
EC_L	1.00	1.00	1.00	1.00	1.00	1.00
g_H	0.10	0.09	0.09	0.10	0.09	0.09
g_L	0.04	0.04	0.04	0.04	0.04	0.04
R	0.12	0.12	0.12	0.15	0.15	0.15
Derived Valuation						
V_{Ht}	52.33	34.78	34.78	21.55	17.76	17.76
V_{LHt+1}	54.48	36.21	36.21	22.43	18.49	18.49
V_{Lt}	21.34	21.76	25.46	11.47	12.20	13.56
Stock Return						
R_H	2.75	1.79	1.53	2.16	1.67	1.51
R_L	1.09	1.09	1.08	1.13	1.13	1.12
R_H-R_L (in percentage points)	166%	70%	45%	103%	55%	39%
V_{LH}-V_L (in %)	155%	66%	42%	95%	51%	36%

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

This table presents the OLS regression results for changes in ROA and ROS around IPO for listed firms in our cross-country sample. We calculate the changes in ROA and ROS from year t-1 to year t+1, and from year t-2 to year t+2; year t represents the IPO year. Panel A reports the results of the sample of A share firms and firms listed in other countries. Panel B reports the results of the sample of A share firms and externally listed Chinese firms. The independent variable of interest is the *A Share Listed* indicator. We control for industry median ROA or ROS measured in year t-1 or t-2, and the change in cash holdings from year t-1 to t, scaled by the book assets in year t-1. *t*-statistics calculated from standard errors clustered by industry and year are reported in parentheses. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels.

Panel A. A Share Listed Firms vs. Firms Listed in Other Countries

	ΔROA [-1, +1]	ΔROS [-1, +1]	ΔROA [-2, +2]	ΔROS [-2, +2]
Variable	(1)	(2)	(3)	(4)
A Share Listed	-0.024***	-0.021**	-0.040***	-0.036***
	(-3.022)	(-2.069)	(-7.656)	(-2.983)
ROA (t-1) or (t-2)	-0.223***		-0.364***	
	(-2.996)		(-9.191)	
ROS (t-1) or (t-2)		-0.255***		-0.241***
		(-3.102)		(-19.733)
Log (Total Assets)	0.005***	0.003**	0.002**	0.001
	(8.132)	(2.203)	(2.181)	(0.005)
Sales Growth	-0.028***		-0.016*	
	(-8.647)		(-1.932)	
EBIT Growth		-0.015***		-0.022***
		(-5.970)		(-13.355)
Δ Cash Holdings [-1,0]	-0.002	0.055***	0.054	0.114
	(-0.100)	(2.622)	(1.255)	(1.628)
Leverage	0.084***	-0.001	0.112***	-0.025
	(8.990)	(-0.143)	(7.282)	(-1.281)
Log (1+Firm Age)	0.008***	0.004	0.009***	0.009
	(5.722)	(0.860)	(3.291)	(1.267)
GDP Growth	-0.099	-0.066	-0.067	-0.142
	(-1.269)	(-0.417)	(-0.709)	(-1.055)
Log (GDP Per Capita)	-0.001	0.008***	0.001	0.005
	(-0.145)	(2.623)	(0.541)	(1.103)
Year/Ind FE	Yes	Yes	Yes	Yes
R-squared (%)	5.33	1.59	4.39	2.82
Observations	35,604	28,022	26,603	20,544

Panel B. A Share Listed Firms vs. Externally Listed Chinese Firms

	ΔROA [-1, +1]	ΔROS [-1, +1]	ΔROA [-2, +2]	ΔROS [-2, +2]
Variable	(1)	(2)	(3)	(4)
A Share Listed	-0.021*	-0.018***	-0.030**	-0.025**
	(-1.649)	(-2.869)	(-1.982)	(-1.990)
Year/Industry/Firm Location FEs	Yes	Yes	Yes	Yes
Other Firm Controls	Yes	Yes	Yes	Yes
R-squared '(%)	55.21	31.43	37.63	22.16
Observations	4,173	4,173	2,398	2,398

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

This table reports the OLS regression results for changes in the earnings management measures in year window [-1, +1] and [-2, +2] around IPO for A share firms and firms listed in other countries. Year 0 denotes the IPO year. Panels A and B compare *Total Accruals/Sales* and *OCF/Sales* of A share firms and firms listed in other countries. We construct the earnings management measure *Total Accruals* as Net Income – Operating Cash Flow, and *Operating Cash Flow (OCF)* is calculated as EBITDA – Income Taxes – Change in Working Capital. We use the same controls in Table 5. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels. See detailed variable definitions in Appendix A.

Panel A. Cross-country Sample: Total Accrual/Sales				
	All	Large	Medium	Small
Variable	(1)	(2)	(3)	(4)
A share Listed	-0.025	-0.103**	-0.078	-0.042
	(-0.789)	(-2.010)	(-0.944)	(-0.382)
Year/Ind FE	Yes	Yes	Yes	Yes
Country Controls	Yes	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes	Yes
R-squared (%)	6.78	11.78	9.65	9.88
Observations	18,757	8,657	3,141	6,959

Panel B. Cross-country Sample: OCF/Sales				
	All	Large	Medium	Small
Variable	(1)	(2)	(3)	(4)
A share Listed	0.043	0.023	0.083	-0.010
	(1.038)	(0.536)	(0.891)	(-0.398)
Year/Ind FE	Yes	Yes	Yes	Yes
Country Controls	Yes	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes	Yes
R-squared (%)	7.05	6.83	8.82	8.52
Observations	12,022	8,826	3,169	7,045

Table 7. Comparing Investment and Cash Flows of A Share Firms with Other Groups of Firms

This table reports the OLS regression estimates from comparing investment and cash flows of A share firms with other groups of firms. The dependent variables are: 1) *Investment*, measured as capital expenditure scaled by total assets in the same year; 2) *Operating Cash Flow*, calculated as (EBITDA – Change in Working Capital – Income Taxes)/Total Assets; and 3) *Net Cash Flow*, calculated as (Operating Cash Flow – Capital Expenditure)/Total Assets. All dependent variables are reported in percentage points. The independent variable of interest is *A Share Listed*, a dummy taking one if the firm is listed in Shanghai or Shenzhen stock exchanges in mainland China, and zero otherwise. Panel A reports estimates from comparing A share firms and listed firms from other countries in our sample. Firm controls are *Log (Total Assets), Leverage, ROA, Sales Growth,* and *Log (Firm Age)*. Control variables are lagged one year. Panel B reports cross-country regressions of net cash flows: Column 1 includes all A share firms, Column 2 excludes A share SOEs, Column 3 excludes the largest 30% A share firms by lagged-one-year market capitalization, Column 4 (5) studies the smallest (largest) 30% A share firms only. In Panels A and B, we include *GDP Growth* and *GDP Per Capita* as country controls. Panel C reports estimates from comparing A share firms and size-and-industry matched unlisted Chinese firms. We employ the nearest neighbor matching and require the ratio of total assets of the A share firm and that of its matched unlisted firms to be within the [80%, 120%] range. Panel D reports estimates from comparing A share firms and size-and-industry matched externally listed Chinese firms. We follow the same matching procedure in Panel C. In Panels D1-D3, we divide the matched sample of A share firms and externally listed Chinese firms into small, medium and large groups based on the 30th and 70th percentile in lagged-one-year-market capitalization of A share firms. We control for lagged-one-year firm characteristics and include year and industry fixed effects in all specifications. In Panels C, D and D1-D3, we also include provincial-level firm location fixed effects. *t*-statistics calculated using the standard errors clustered by industry and year are reported in the parentheses. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels. See variable definitions in Appendix A.

Panel A. Comparing A share Firms with Firms from Other Countries

	Investment	Operating Cash Flows	Net Cash Flows
Variable	(1)	(2)	(3)
A share Listed	0.551***	-0.221	-0.766***
	(4.352)	(-0.733)	(-2.645)
Log (Total Assets)	-0.186***	0.867***	1.088***
	(-8.197)	(9.733)	(10.728)
Leverage	0.207	4.014***	4.123***
	(1.386)	(6.110)	(5.499)
Log (1+Firm Age)	-0.423***	0.345***	0.813***
	(-10.004)	(4.028)	(7.384)
Sales Growth	0.010***	-0.007**	-0.017***
	(6.548)	(-2.201)	(-4.112)
ROA	1.121***	56.399***	54.981***
	(4.173)	(45.021)	(44.013)
Year/Industry FE	Yes	Yes	Yes
Country Controls	Yes	Yes	Yes
R-squared (%)	11.27	28.18	26.79
Observations	545,946	546,798	546,798

Panel B. Net Cash Flows of A Share Firms: Alternative Samples

	All Sample	Drop SOEs	Drop Large	Small Only	Large Only
Variable	(1)	(2)	(3)	(4)	(5)
A Share Listed	-0.766***	-1.110***	-1.148*	-0.252	-2.052***
	(-2.645)	(-2.833)	(-1.762)	(-0.277)	(-6.398)
Country/Firm Controls	Yes	Yes	Yes	Yes	Yes
Year and Ind FE	Yes	Yes	Yes	Yes	Yes
R-squared (%)	26.79	26.62	30.07	30.21	30.44
Observations	546,798	528,617	533,236	516,620	512,926

Panel C. A share Firms vs Matched Unlisted Chinese Firms			
	Investment	Operating Cash Flows	Net Cash Flows
Variables	(1)	(2)	(3)
A Share Listed	2.220*	-4.070**	-3.633**
	(1.815)	(-2.253)	(-1.990)
Year/Ind/Location FEs	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes
R-squared (%)	11.77	13.23	6.18
Observations	19,218	18,639	18,638

Panel D. A share Firms vs Matched Externally Listed Chinese Firms			
	Investment	Operating Cash Flows	Net Cash Flows
Variables	(1)	(2)	(3)
A Share Listed	0.0402	0.391	0.382
	(0.311)	(1.325)	(1.366)
Year/Ind/Location FEs	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes
R-squared (%)	19.20	11.10	4.43
Observations	17,886	17,353	17,353

Panel D1. Large A share Firm and Matched Externally Listed Chinese Firms			
	Investment	Operating Cash Flows	Net Cash Flows
Variables	(1)	(2)	(3)
A Share Listed	0.404**	-0.072	-0.653**
	(2.198)	(-0.029)	(-1.980)
Year/Ind/Location FEs	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes
R-squared (%)	43.32	27.93	11.07
Observations	2,546	2,316	2,316

Panel D2. Medium A share Firm and Matched Externally Listed Chinese Firms			
	Investment	Operating Cash Flows	Net Cash Flows
Variables	(1)	(2)	(3)
A Share Listed	0.504**	0.597	-0.193
	(2.225)	(1.152)	(-0.402)
Year/Ind/Location FEs	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes
R-squared (%)	20.54	11.54	5.03
Observations	5,073	4,970	4,970

Panel D3. Small A share Firm and Matched Externally Listed Chinese Firms			
	Investment	Operating Cash Flows	Net Cash Flows
Variables	(1)	(2)	(3)
A Share Listed	-0.684***	0.374	0.962*
	(-3.375)	(0.633)	(1.709)
Year/Ind/Location FEs	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes
R-squared (%)	15.32	10.52	4.64
Observations	9,834	9,639	9,639

Table 8. Summary Statistics of Corporate Governance Measures

This table presents statistics of the governance index for A share and for other markets, and the components of the G-Index. Panel A reports the governance measure, G-Index-I, for the cross-country sample. G-Index-I ranges from 0 to 7. It is the sum of scores on the following dimensions: CEO duality, board size, ownership concentration, and executive holdings. The score on CEO duality takes 1 if the firm's CEO and chairman is the same person, and 0 otherwise. The score on board size ranges from 0 to 2: it takes 2 if the firm's board size (measured by the number of directors) is smaller than the 30th percentile, and 1 if between the 30th and 70th percentile, and 0 if larger than the 70th percentile. The scores on ownership concentration and executive holdings both range from 0 to 2: they take 2 if the variable is larger than the 70th percentile, and 1 if between 30th and 70th percentile, and 0 is smaller than the 30th percentile. Percentile points are determined by country and by year. We report value-weighted average G-Index-I for each group, with the lagged-one-year market capitalization as the weight. The G-Index-I is available for firms listed in 75 countries in our sample. Panel B reports summary statistics of the governance measure for A share firms, G-Index-A, and its components. G-Index-A ranges from 0 to 6 and is the sum of scores on the following dimensions: CEO duality, state ownership, executive holdings, board size, ownership concentration, and related-party transactions (RPT). We add one to the G-Index-A if (i) firm's CEO and chairman is the same person; or (ii) firm's state holdings (central SASAC, local SASAC and other government agencies) are less than 40%; or (iii) the proportion of shares held by the firm's executives exceeds the 70th percentile of the year; or (iv) the board size is below the 30th percentile; or (v) if the proportion of shares held by the firm's largest 5 shareholders exceeds the 70th percentile; or (vi) the firm does not have net cash outflows in related-party transactions in the year. In the bottom of Table 8, Panel B, we compare the average G-Index-A for large and small A share firms and for SOEs and non-SOEs. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels.

Panel A. Governance Measure and its Components for the Cross-country Sample (G-Index-I)

Country	Component	Mean	Median	StDev	Max	Min
China A share	CEO Duality	0.208	0	0.406	1	0
	Ownership Concentration	0.539	0.546	0.152	0.891	0.201
	Executive Holdings	0.104	0.001	0.186	0.681	0
	Board Size	16.8	16	4.029	54	1
	G-Index-I	**2.035**	**2**	**1.599**	**7**	**0**
Hong Kong	CEO Duality	0.022	0	0.146	1	0
	Ownership Concentration	0.312	0.250	0.321	1	0
	Executive Holdings	0.277	0.147	0.286	0.717	0.0001
	Board Size	9.7	9	2.938	22	4
	G-Index-I	**2.836**	**3**	**1.018**	**6**	**0**
US	CEO Duality	0.090	0	0.286	1	0
	Ownership Concentration	0.066	0.057	0.068	1	0
	Executive Holdings	0.102	0.061	0.443	1	0
	Board Size	9.7	9	3.573	33	1
	G-Index-I	**2.355**	**3**	**0.863**	**7**	**0**
Other Countries	CEO Duality	0.208	0	0.406	1	0
	Ownership Concentration	0.116	0	0.211	1	0
	Executive Holdings	0.438	0.478	0.262	0.923	0
	Board Size	8.7	8	4.455	34	1
	G-Index-I	**2.433**	**2**	**0.835**	**7**	**0**

Panel B. Governance Measure and Specific Components for A share firms (G-Index-A)

	Component	Mean	Median	StDev	Max	Min
	G-Index-A	**2.671**	**3**	**1.096**	**6**	**0**
China A share	State Ownership	0.116	0	0.211	1	0
	RPT Net Out Amt	0.007	0	0.117	0.524	-0.475

Comparing G-Index-A for A share Firms

Small	2.770	Large	2.661	Difference	0.108***	t-value 7.76
SOE	2.211	Non-SOE	2.910	Difference	0.699***	t-value 62.56

Table 9. Summary Statistics of Investors' Behavioral Biases Measures

Panel A presents summary statistics of the two (market-level) sentiment measures and their components. *Sentiment*$_1$ is estimated as the first principal component of two variables: volatility premium (PVOL), and market turnover (TURN), which are available for 58 countries in our sample. *Sentiment*$_2$ is estimated as the first principal component of four sentiment proxies: # of IPOs (Ln (# IPO)), IPO first-day returns (RIPO), plus PVOL and TURN, available for 17 countries. We report the value-weighted average Sentiment$_1$ and Sentiment$_2$ for each group, with the lagged-one-year market capitalization as the weight. Panel B reports the summary statistics of the investor behavior measures for A share firms: annualized market-level AH premium and individual stock-level turnover. We calculate *AH premium* as the A share price in USD/H share price in USD*100 using stocks cross-listed in A and H share markets. To obtain the market-level measure, we take value-weight average across firms with the total market value of each pair's A and H shares as the weights. Annual stock-level turnover is estimated as annual trading volume divided by the number of shares.

Panel A. Summary Statistics of Sentiment Variables and Their Components

Country	Component	Mean	Median	StDev	Max	Min
China	PVOL	0.385	0.305	0.253	0.937	-0.002
	Ln (# IPO)	4.773	4.732	0.774	6.078	2.708
	RIPO	1.366	1.149	1.170	4.235	0.000
	TURN	0.208	0.135	0.358	0.959	-0.353
	Sentiment$_1$	0.723	0.322	0.966	1.688	-1.242
	Sentiment$_2$	0.966	-0.174	1.252	3.137	-1.600
Hong Kong	PVOL	0.477	0.426	0.267	0.921	0.011
	Ln (# IPO)	3.823	4.094	1.112	5.075	0.000
	RIPO	0.389	0.107	0.735	2.647	0.007
	TURN	0.114	-0.084	0.726	2.585	-0.698
	Sentiment$_1$	0.456	0.042	1.121	2.412	-2.353
	Sentiment$_2$	0.964	-0.151	1.454	3.153	-1.594
US	PVOL	0.574	0.568	0.373	1.110	-0.248
	Ln (# IPO)	4.644	4.673	0.639	5.940	3.045
	RIPO	0.157	0.139	0.106	0.564	0.057
	TURN	0.028	-0.037	0.416	1.024	-0.601
	Sentiment$_1$	-0.311	-0.442	0.916	1.988	-1.650
	Sentiment$_2$	-0.500	-0.300	1.511	5.797	-1.718
Other Countries	PVOL	0.123	0.197	0.469	1.144	-1.238
	Ln (# IPO)	3.101	3.113	1.105	5.313	0.000
	RIPO	0.258	0.182	0.295	1.433	-0.094
	TURN	-0.004	-0.038	0.272	1.205	-0.750
	Sentiment$_1$	0.280	0.056	1.068	3.366	-3.102
	Sentiment$_2$	0.106	0.018	1.160	4.116	-2.872

Panel B. Summary Statistics of Investor Behavior Measures for the A Share Sample

	Mean	Median	StDev	Min	Max
Market-level AH premium	1.328	0.843	1.33	0.062	6.604
Stock-level Turnover	3.148	2.487	2.383	0.271	12.178

Table 10. Comparisons of Return Factors: Institutional Features, Corporate Governance, and Investors' Behavioral Biases

This table compares the effects of corporate governance, investor behavior, and earnings management, among other factors, on annual stock returns. Panel A employs the cross-country sample. We construct the global governance measure *G-Index-I* and two investor sentiment measures (*Sentiment*$_1$ and *Sentiment*$_2$). They are lagged one year when entering the regressions. *ΔROA[-1,+1]* is the change in ROA from the year prior to IPO to the year after. Column 8 includes the contemporaneous investment efficiency measure, ROIC. Panel B reports the regression results for A share firms. The dependent variable is annual stock returns in real terms. We construct the A share governance measure *G-Index-A* and two investor behavioral measures: (i) annual stock-level turnover; (ii) industry-level AH premium. Both measures are lagged one year when entering the regressions. *Stock-level Turnover* is estimated as the annual trading volume divided by the number of shares. The *AH Premium* is estimated as A share price in USD/H share price in USD*100. To obtain the industry-level measure, we take value-weight average across firms by industry with the total market value of each pair's A and H shares as the weight. *Firm Controls* include firm characteristics, provincial-level location fixed effects, SOE and ST indicators. All the continuous explanatory variables are normalized through dividing the original value by its standard deviation. We employ WLS regressions where we use the lagged-one-year market capitalization as the weight. *t*-statistics calculated using the standard errors clustered by industry and by year are reported in the parentheses.

Panel A. Cross-country Sample

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
G-Index-I	1.407**				1.330**	1.138**	1.411**	1.632***
	(2.414)				(2.291)	(2.225)	(2.425)	(2.826)
Sentiment$_1$		-4.673***			-4.402***			
		(-4.385)			(-2.892)			
Sentiment$_2$			-8.862***			-7.091***		-6.775***
			(-6.471)			(-3.382)		(-3.316)
ΔROA [-1, +1]				1.973***			2.076**	2.061**
				(2.784)			(2.473)	(2.455)
ROIC								5.714***
								(6.393)
A Share Listed	-14.789**	-29.824***	-2.277	-23.318**	-15.580**	-9.566	-14.627**	-3.306
	(-2.355)	(-3.052)	(-0.422)	(-2.289)	(-2.214)	(-1.182)	(-2.337)	(-0.412)
Year/Ind. FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared (%)	5.33	6.32	6.72	5.30	6.27	6.75	5.34	7.34
Observations	495,651	423,418	411,885	495,651	424,940	411,885	495,651	411,885

Panel B. A share Listed Firms

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
G-Index-A	1.445***				1.358***	1.359***	1.341**	0.914*
	(2.885)				(2.556)	(2.795)	(2.355)	(1.906)
AH Premium		-14.024**			-0.951			
(Industry-level)		(-2.335)			(-0.304)			
Stock-level Turnover			-2.475***			-1.617***	-1.568*	-0.720
			(-3.866)			(-2.177)	(-1.892)	(-0.902)
Δ ROA [-1, +1]				0.869**			0.863**	0.051
				(2.115)			(2.093)	(0.133)
ROIC								8.000***
								(8.013)
Ind./Location FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Country Controls	No	Yes	No	No	No	No	No	No
R-squared (%)	52.40	4.27	52.33	52.41	53.67	53.27	53.29	54.40
Observations	36,044	28,251	34,386	36,017	28,251	34,406	34,406	31,712

Table 11. Corporate Governance and Operating Performance

This table examines the role of corporate governance in explaining firms' operating performance. Panel A reports the estimation results from the cross-country sample. The dependent variable is annual operating performance measures. The independent variable of interest is *G-Index-I.* Firm controls are the same as we use in Table 7, Panel A. Both *G-Index-I* and firm controls are lagged one year when entering the regressions. Panel B excludes the largest 30% A share firms from the cross-country sample. Panel C examines the relationship between governance and operating performance for A share firms. Firm controls include *Log (Market Capitalization)* and the *Market-to-Book ratio*. Columns 1 to 3 employ the full sample period 2000-2018. Column 4 employs the sample period 2010-2018. Dependent variables are operating performance measures. The independent variable of interest is the governance measure for A share firms *G-Index-A*. *G-Index-A* is constructed by firm and by year. Both *G-Index-A* and controls are lagged one year. *t*-statistics calculated using the standard errors clustered by industry and year are reported in the parentheses. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels. See variable definitions in Appendix A.

Panel A. Governance and Operating Performance in Cross-country Sample

	Investment	OCF	NCF
Variable	(1)	(2)	(3)
G-Index-I	0.136***	0.893***	0.723***
	(3.492)	(10.352)	(6.145)
A share Listed	0.393**	-0.325***	-0.705**
	(2.075)	(-2.683)	(-2.465)
Country/Firm Controls	Yes	Yes	Yes
Ind/Year FE	Yes	Yes	Yes
R-squared (%)	11.07	35.58	34.13
Observations	454,499	454,499	454,499

Panel B. Governance and Operating Performance in Cross-country Sample: Dropping Large A Share Firms

	Investment	OCF	NCF
Variable	(1)	(2)	(3)
G-Index-I	0.134***	0.943***	0.771***
	(3.233)	(10.429)	(6.195)
A share Listed	0.101	-0.199	-0.073
	(0.513)	(-0.542)	(-0.162)
Country/Firm Controls	Yes	Yes	Yes
Ind/Year FE	Yes	Yes	Yes
R-squared (%)	11.09	35.56	34.13
Observations	443,505	443,505	443,505

Panel C. Governance and Operating Performance in A Share Sample

	Investment	OCF	NCF	NCF (2010-2018)
Variable	(1)	(2)	(3)	(4)
G-Index-A	0.387***	0.448***	0.066	0.136*
	(11.452)	(4.812)	(0.823)	(1.782)
Year/Ind/Province FE	Yes	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes	Yes
R-squared (%)	12.52	10.23	2.32	2.31
Observations	31,085	29,885	29,885	19,153

Table 12. Summary of Additional Tests and Robustness Checks

This table examines the heterogeneities of the cross-country sample and the A share sample in terms of stock returns and operating performance. Panel A compares the underperformance of the largest 30% A share firms and SOEs within the A share firm sample. Panel B decomposes the performance gaps of three groups of A share firms: (i) newly-listed (firms conduct IPO within two year), (ii) incumbent, and (iii) ST firms, and also by state ownership. We first allow all A share firms to enter the cross-country regressions and estimate the coefficient of the A share indicator (Row 1), then allow incumbent firms and incumbent plus newly listed firms to enter the regressions (Rows 2 and 3). In Panel C, we take the differences in the regression coefficients of the A share indicator (in Panel B) in order to measure the marginal contribution of each of the three groups of firms to the overall performance gap. The contribution by the ST firms (newly listed firms) is measured by the difference in coefficients in Row 1 and Row 3 (Row 2 and Row 3) of Panel B. We divide the performance gap of each group of firms by the total A share performance gap to obtain the relative contribution (in percentages) of each group. When the dependent variable is stock returns, we employ WLS regressions where we use the lagged-one-year market capitalization as the weight; when the dependent variables are operating performance measures, we use OLS regressions. *t*-statistics calculated using the standard errors clustered by industry and by year are reported in the parentheses. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels.

Panel A. Performance of Large A share Firms and SOEs

	Stock Returns	Investment	OCF	NCF
	(1)	(2)	(3)	(4)
Large	-6.353***	0.459***	-0.276	-0.766***
	(-3.952)	(6.032)	(-1.342)	(-3.752)
SOE	-2.793*	0.074	0.138	0.132
	(-1.842)	(1.053)	(0.935)	(0.915)
Year/Industry/Province FE	Yes	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes	Yes
R-squared (%)	52.48	16.01	10.23	4.55
Observations	36,044	35,879	34,459	34,459
Differences in Coefs. of "Large" and "SOE"	-3.560	0.385***	-0.414	-0.898***
	(-1.601)	(3.717)	(-0.405)	(-3.592)

Panel B. Decompose Underperformance of A Share Firms: Regression Coefficients of the A Share

	All Firms	SOEs	Non-SOEs
	(1)	(2)	(3)
(1) All A Share Firms (Incumbent + Newly listed + ST)	-14.948**	-12.778***	-12.746***
	(-2.389)	(-3.645)	(-3.634)
(2) Incumbent Only	-7.274**	-7.596**	-5.373*
	(-2.192)	(-2.038)	(-1.655)
(3) Incumbent+ Newly listed	-11.893***	-9.91***	-10.167***
	(-2.965)	(-2.834)	(-2.929)

Panel C. Decompose Underperformance of A Share Listed Firms (in Percentages)

	All Firms	All Firms (in %)	SOEs	SOEs (in %)	Non-SOEs	Non-SOEs (in %)
	(1)	(2)	(3)	(4)	(5)	(6)
Firms in ST Status	3.055	20.44%	2.868	22.44%	2.579	20.23%
Incumbent Firms	7.274**	48.66%	7.596**	59.45%	5.373*	42.15%
Newly Listed Firms	4.619	30.90%	2.314	18.11%	4.794	37.61%

Table 13. Performance of Cross-listed A Share Firms

This table compares stock returns and operating performance of listed firms cross-listed in the A share and Hong Kong markets, and non-cross-listed A share firms. Panel A compares RPT activities of cross-listed and non-cross listed A share firms. The dependent variables are *RPT Amt Out*, and *Stock Returns (in percentage points)*. Columns 1 and 3 show regression results of the full sample of A share firms, while Columns 2 and 4 show results of a matched sample of cross-listed and non-cross-listed A share firms. Each cross-listed firm is matched with one non-cross-listed A share firm in the same industry and with the closest book assets in the IPO year; 99 firms cross-listed in HKEX are matched following this procedure. Panel B presents the results on their operating performance. Explanatory variables are lagged by one year when entering the regressions. In Panel A, Columns 3 and 4, we employ WLS regressions where the dependent variable is stock returns, and we use the lagged-one-year market capitalization as the weight. We employ OLS regressions in Columns 1 and 2 of Panel A, and all the columns in Panel B. *t*-statistics calculated using the standard errors clustered by industry and by year are reported in parentheses. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels.

Panel A. Cross-listing, RPT, and Stock Returns

	RPT Amt Out		Stock Returns	
	Whole Sample	Matched Sample	Whole Sample	Matched Sample
	(1)	(2)	(3)	(4)
Cross-listed	-0.026**	0.001	1.588	-0.954
	(-2.445)	(0.266)	(0.972)	(-0.609)
Year\Industry\Location FE	Yes	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes	Yes
R-squared (%)	4.67	17.66	46.72	62.23
Observations	33,028	2,306	38,505	2,423

Panel B. Cross-listing and Operating Performance for Matched Sample

	ROA	ROE	Net Income Growth	Operating Cash Flows	Investment	Net Cash Flows
	(1)	(2)	(3)	(4)	(5)	(6)
Cross-listed	-0.006	0.033	-0.041	-0.007	0.007	-0.008
	(-1.513)	(0.372)	(-0.592)	(-1.542)	(1.552)	(-1.637)
Year\Industry\Location FE	Yes	Yes	Yes	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
R-squared (%)	56.10	1.92	14.01	32.20	58.41	9.48
Observations	2,438	2,463	2,463	2,162	2,451	2,162

Appendix A. Data Sources and Variable Definitions

Variable	Definition
WOLRDSCOPE & DATASTREAM	
Stock-level Variables	
Stock Returns	Monthly/annual stock returns of firms listed in markets other than China, US, Brazil and Hong Kong, adjusted for stock splits and inflation (measured by monthly CPI)
Firm-level Variables	
ROA	EBIT in year t/total assets in year t
ROE	Net income in year t/total equity in year t
ROS	(Net sales – cost of goods sold) in year t/net sales in year t
Operating Cash Flows	(EBITDA – changes in working capital – income taxes)/total assets
Net Cash Flows	(Operating cash flow – capital expenditure)/total assets
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	(Net sales in year t – net sales in year t-1)/net sales in year t
Firm Age	The number of years since a firm's foundation
Total Accrual	Net income – operating cash flow (OCF)
ROIC	Net operating profits (net income adding after tax interest expenses) divided by invested capital (sum of long-term debt, minority interests, preferred equity, and common equity)
$Sentiment_1$	The first principal component of the two proxies: volatility premium (PVOL), and market turnover (TURN), available for 58 countries
$Sentiment_2$	The first principal component of four proxies: # of IPOs (Ln (# IPO)), IPO first-day returns (RIPO), volatility premium (PVOL), and market turnover (TURN), and is available for 17 countries
Country-level Variables	
EBIT of Listed Firms/GDP	Total EBIT of listed firms in a country over its GDP in the same year
BoardEx and Risk Metrics	
G-Index-I	G-Index-I ranges from 0 to 7 and is the sum of scores on the following dimensions: CEO duality, board size, ownership concentration and executive holdings. The score on CEO duality takes 1 if the firm's CEO and chairman is the same person, and 0 otherwise. The scores on board size, ownership concentration and executive holdings range from 0 to 2, determined by the 30^{th} and 70^{th} percentile points in the corresponding variables.
CAFR-Chinese Stock Market Research Project	
Stock Returns	Monthly/annual stock returns of firms listed in Shanghai or Shenzhen stock exchanges ('A share') for 2000-2013, adjusted for stock splits and inflation
WIND	
Stock Returns	Monthly/annual stock returns of A share listed firms for 2014-2018, adjusted for stock splits and inflation
Return Volatility	Annualized return volatility (standard deviation) of A share and HK listed firms, estimated from daily or weekly stock returns
SOE	Firms that are ultimately controlled by the central State-owned Assets Supervision and Administration Commission of the State Council (SASAC), Ministry of Finance, local SASACs, or other government agents.
Stock-level Turnover	Monthly trading volume divided by the number of shares.
AH Premium	Firm-level AH premium is calculated as A share price in USD/H share price in USD*100. Then we take the value-weighted average across firms with the total market value of each pair's A and H shares as the weight to obtain market-level.
G-Index-A	G-Index-A ranges from 0 to 6 and has six components: CEO duality, state ownership, executive holdings, institutional holdings, ownership concentration, and related-party transactions (RPT). We add one to the G-Index-A if (i) firm's CEO and chairman is the same person; or (ii) firm's state holding is less than 40%; or (iii) the proportion of shares held by the firm's executives is larger than the 70^{th} percentile; or (iv) the firm's largest 5 shareholders' holdings exceed the 70th percentile; or (v) the firm's board size is smaller than the 30^{th} percentile; or (vi) the firm does not have net cash outflows in its RPTs.

Appendix A. Data Sources and Variable Definitions – Cont'd

Variable	Definition
CSMAR	
RPT Amt Out	The aggregated amount of money a listed firm paid out in its related-party transactions in a given year, scaled by total assets
NBS CIED (China Industrial Enterprise Database)	
	Financial variables for unlisted firms in China for 1998-2013. Firm-level variables are constructed in the same way as listed firms
COMPUSTAT (Global), CRSP	
	Daily, weekly and yearly stock returns and other market and financial information for firms listed in US and firms listed in Brazil
WORLD BANK	
GDP Growth	Real GDP growth in constant local currency (adjusted for inflation)
GDP Per Capita	The ratio of total GDP to total population in million US dollar
Consumption Volatility	The standard deviation of aggregate annual consumption in one country in trillion US dollars for the sample period
Credit from Financial	Domestic credit provided by the financial sector, including all credits to various sectors on a gross basis, with the exception of credit to the central government.
M2/GDP	The ratio of the sum of money and quasi money (M2) to GDP. M2 comprises the sum of currency outside banks, demand deposits, and the time, savings, and foreign currency deposits of resident sectors other than the central government
IMF Economic Outlook Database and Maddison-Project Website	
GDP Per Capita in PPP	GDP per capita in purchase power parity (PPP) terms for China, South Korea and Taiwan for 1960-2018
BLOOMBERG	
Stock Index	Major stock index of large countries on yearly basis: SSE Composite Index (China), S&P 500 (US), BSE Sensex (India), IBOV (Brazil) and Nikkei 225 (Japan)
WFE (World Federation of Exchanges)	
Stock Turnover Ratio	The annualized ratio of the electronic order book turnover of domestic shares relative to their market capitalization
DLLS (Djankov, La Porta, Lopez-de-Silanes, and Shleifer, 2008)	
Anti-self-dealing index	Average of ex-ante and ex-post private control of self-dealing, ranging from zero to one. Larger value represents better control of self-dealing
Time to collect on a bounced check	Logarithm of the length (in calendar days) of the judicial procedure to collect on a bounced check
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

Appendix B. Procedures to Identify Externally Listed Chinese Firms

Hong Kong Listed Chinese Firms

Data for firms listed in the Hong Kong Stock Exchange are from CSMAR. We include all CSMAR-defined "China Concept Stocks" listed in HKSE to form the sample of Hong Kong Listed Chinese Firms. "China Concept Stocks" include the "H share" stocks, i.e., firms that are registered in mainland China and listed in Hong Kong; the "Red Chip" stocks, i.e., firms that are registered outside China but have its major business and operations in mainland China, and listed in Hong Kong; and other stocks of which the major shareholders, major business and operations are in mainland China and listed in Hong Kong.

US Listed Chinese Firms

Data for firms listed in US are from Compustat and CRSP. Compustat contains a variable named "LOC", which refers to the ISO country code/headquarter of the listed firm. We identify firms that have its "LOC" equal to "CHN" as US Listed Chinese Firms.

Singapore and Other Markets Listed Chinese Firms

Data for firms listed in Singapore or other countries are from Datastream. This contains a variable named "headquarter", which refers to the country that the listed firm is headquartered in. Another variable "country" refers to the country that the firm is listed in. We define firms that have their "headquarter" equal to "CHINA" and "country" equal to country names other than China (such as "SINGAPORE") as Chinese firms listed in Singapore and other external markets.

Internet Appendix to
"Dissecting the Long-term Performance of the Chinese Stock Market"

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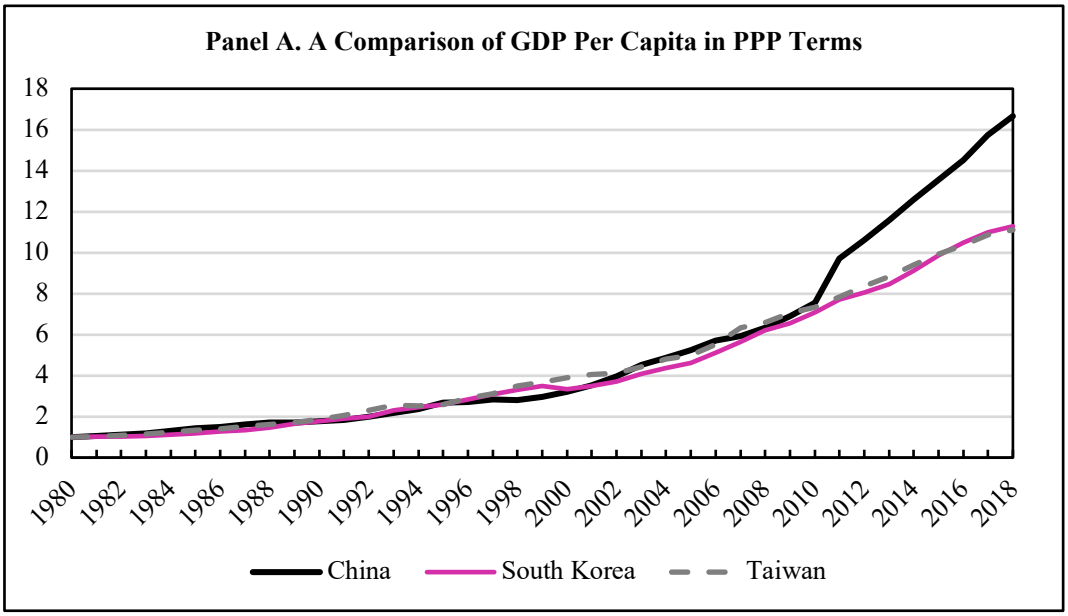
This internet appendix includes 8 sections of tables/figures as robustness tests and additional results related to the empirical results reported in the paper, and proofs of propositions and other key results of the theoretical model.

1. Plots of GDP per capita and GDP growth for China and other large countries: Figures IA1 and IA2;
2. More evidence on the underperformance of A share firms (whole sample and subsets): Figures IA3, IA4, IA6; Tables IA1 and IA2;
3. Performance of listed firms from India: Figure IA5; Table IA3
4. Operating performance around and stock market reaction to the "Split-share Reform" (SSR) in China: Tables IA4, IA5, and IA6;
5. Validation of AH premium measures: Figure IA7;
6. Additional evidence of the two main hypotheses: "institutional and governance deficiencies" and "investors' behavioral biases": Figure IA8; Tables IA7-IA16, IA18
7. Tests concerning the "financial repression" hypothesis and other hypotheses: Figures IA9, IA10; Tables IA17, IA19, IA20.
8. Derivations and proofs of the key results of the theoretical model: Pages 31-32.

Figure IA1. Per Capita and Normalized Real GDPs of China and Other Economies

This figure plots the normalized GDP of China and other economies. GDP figures are in local currencies and adjusted for inflation. Panel A plots the per capita normalized GDP in PPP terms for China, Taiwan, and South Korea. For China, we plot the data for 1980-2018, and the per capita GDP figure in 1980 is normalized to 1; for South Korea and Taiwan, we plot the data for 1960-1998, and the per capita GDP figure in 1960 is normalized to 1. Per Capita GDP data for 1960-2010 of the economies are from Maddison Historical Statistics (http://www.ggdc.net/maddison/maddison-project/home.htm, 2018 version), and the data for the post-2010 period are from IMF (see https://www.imf.org/external/pubs/ft/weo/2018/02/weodata/index.aspx for more details of the Economic Outlook database). Panel B plots the real GDP (adjusted for inflation) of China, the US, India, Brazil, and Japan for 2000-2018; data are obtained from the World Bank and are normalized to 1 in 2000 (the common starting year).



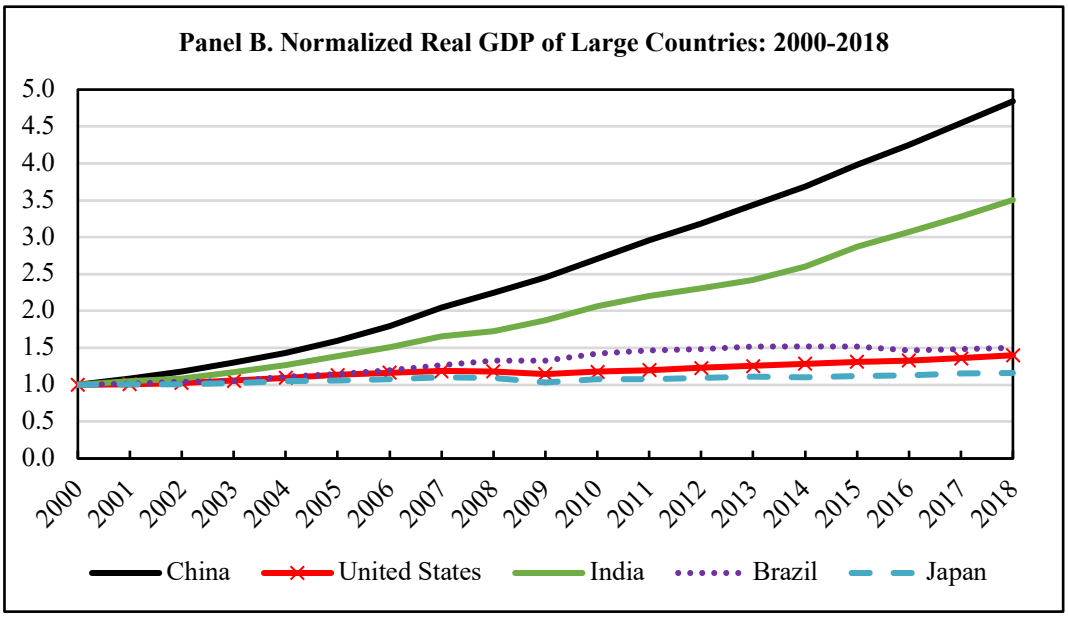
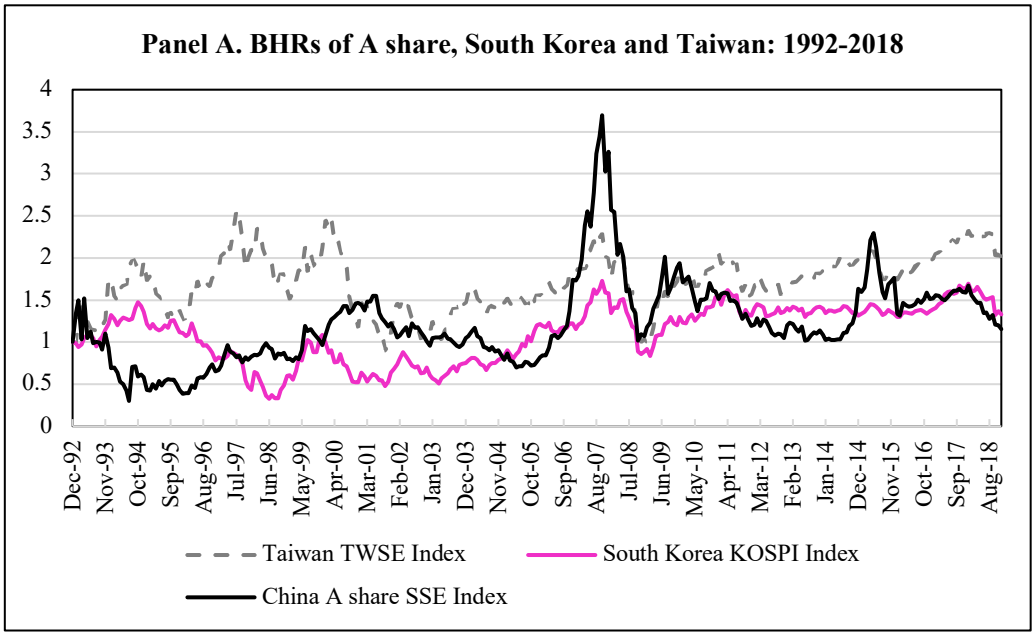


Figure IA2. Comparison of BHRs of Indices of A Share, South Korean and Taiwan Markets

This figure plots the cumulative, buy-and-hold returns of stock indices of China's A share (the SSE Index), South Korea (the KOSPI Index), and Taiwan (the TWSE Index) markets. In Panel A, we plot BHRs of all three indices from December 1992 to December 2018. In Panel B, we plot the BHRs for the A share SSE index from the end of 2000 to the end of 2018 and plot the BHRs for the South Korea and Taiwan indices from the end of 1980 to the end of 1998 (twenty years before the A share plot). Stock returns are adjusted for inflation measured by the CPIs in the economies as reported by the IMF.



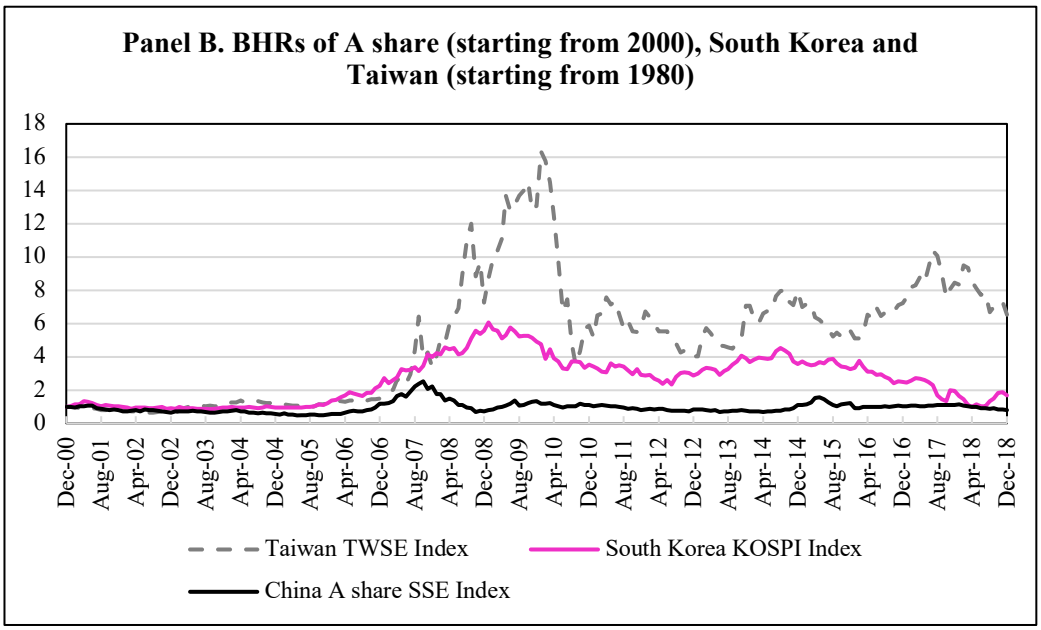
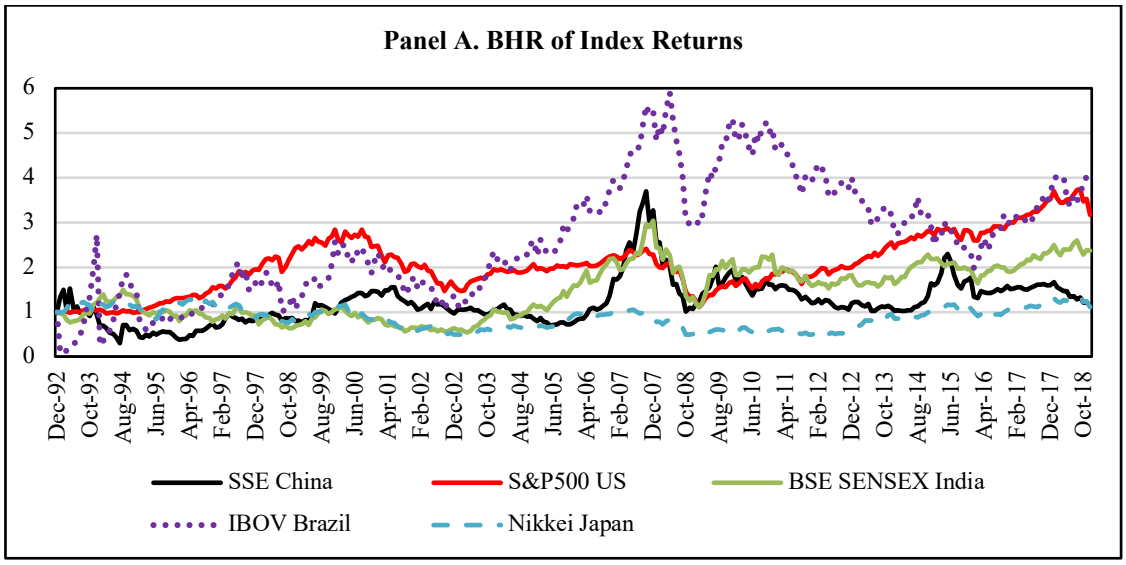


Figure IA3. BHRs of Major Indexes, A Share and Externally Listed Chinese Firms

Panel A plots the cumulative monthly returns of the stock indices from December 1992 to December 2018. The indices are: SSE Composite Index (China), S&P 500 (US), BSE Sensex (India), IBOV (Brazil) and Nikkei 225 (Japan). The nominal returns are in local currencies and adjusted for local inflation, measured by the month-end CPI. The SSE index was launched on July 15, 1991, with the constituents weighted by the total market value of all outstanding shares. The S&P 500 index is calculated based on the 500 large companies that have common stocks listed in NYSE or NASDAQ. SENSEX is a free-float market-weighted market index of the 30 largest and most actively traded stocks listed on the Bombay Stock Exchange. IBOV (IBOVESPA) is an index of stocks that are traded on B3 (Brasil Bolsa Balcão S.A.). The Nikkei index was founded in 1950 and is composed of 225 blue-chip companies traded on the Tokyo Stock Exchange; the constituent stocks of this price-weighted index are ranked by their share prices rather than by market capitalization. Data on the indices are collected from Bloomberg. Panel B plots the value-weighted BHRs of the stocks in China' A share market and externally listed Chinese firms. We calculate the BHRs of externally listed Chinese firms in USD and CNY. The BHRs are calculated by accumulating value-weighted *monthly* returns of all the stocks listed in the country with the lagged-one-year market capitalization as the weight. For externally listed Chinese firms, the weight is the lagged-one-year market capitalization in US dollars. The returns are calculated at month-end, adjusted for stock splits and include cash dividends. Nominal returns are denominated in local currencies and adjusted for local inflation to be converted to real returns. Inflation is measured by the month-average CPI rate of the listing country/economy.



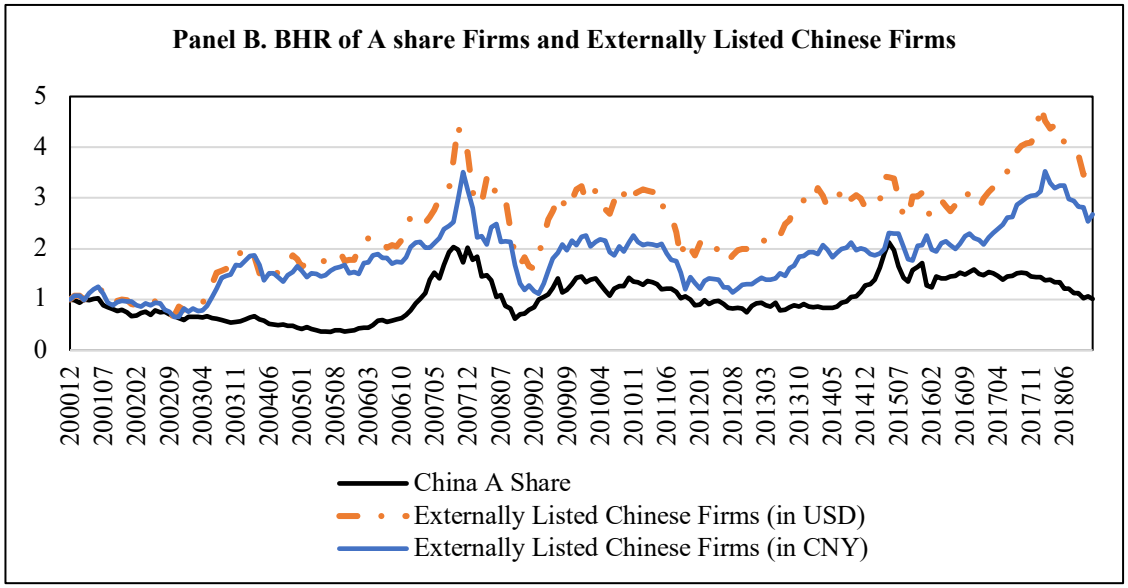


Figure IA4. Comparison of BHRs of A Share Stocks, Bank Deposits and Government Bonds

This figure plots the BHRs of bank deposits, government bonds and A share stocks. The black line represents the value-weighted BHRs of A share stocks, with the lagged-one-year market capitalization as the weights. Returns are adjusted for stock splits and include cash dividends. The bars represent cumulative returns on 1-year and 5-year bank deposits and returns on 3- year and 5-year government bonds in China. Nominal returns on bank deposits, government bonds and stocks are adjusted for inflation (measured by the year-end inflation rate) to be converted to real returns.

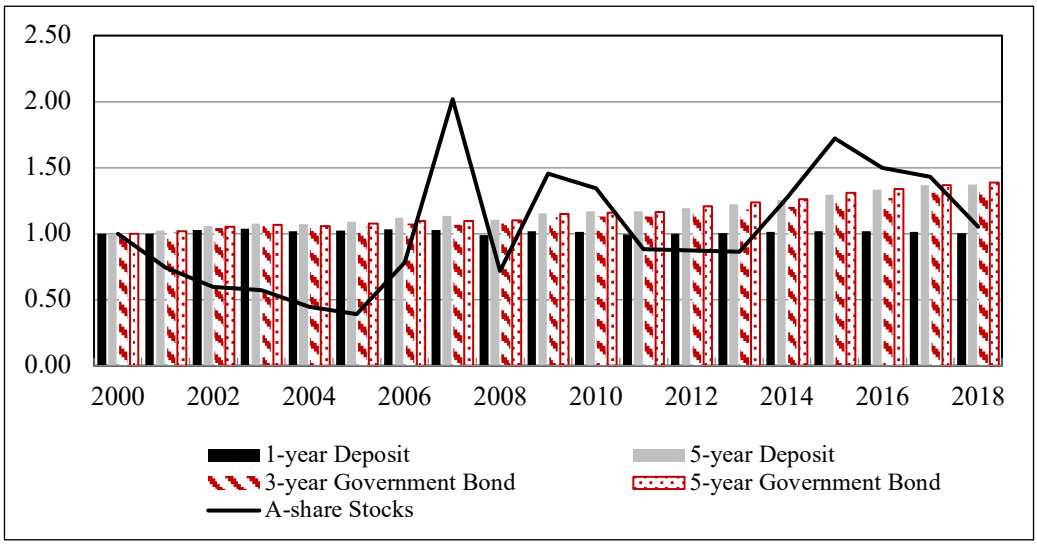


Figure IA5. Comparing the BHRs of Domestically and Foreign Listed Indian Firms

This figure plots the cumulative, buy-and-hold returns of domestically listed Indian firms and a total of 202 Indian firms listed in external markets, including Luxembourg (91 firms), the UK (44 firms), Germany (44 firms), and the US (23 firms). We obtain data from Datastream; for externally listed Indian firms, we also obtain information from Bloomberg. We adjust annual stock returns by contemporaneous CPI rate in the listing country. When we convert the stock prices and returns of externally listed Indian firms into Indian Rupee, we use the inflation rates in India to adjust nominal rates to real returns.

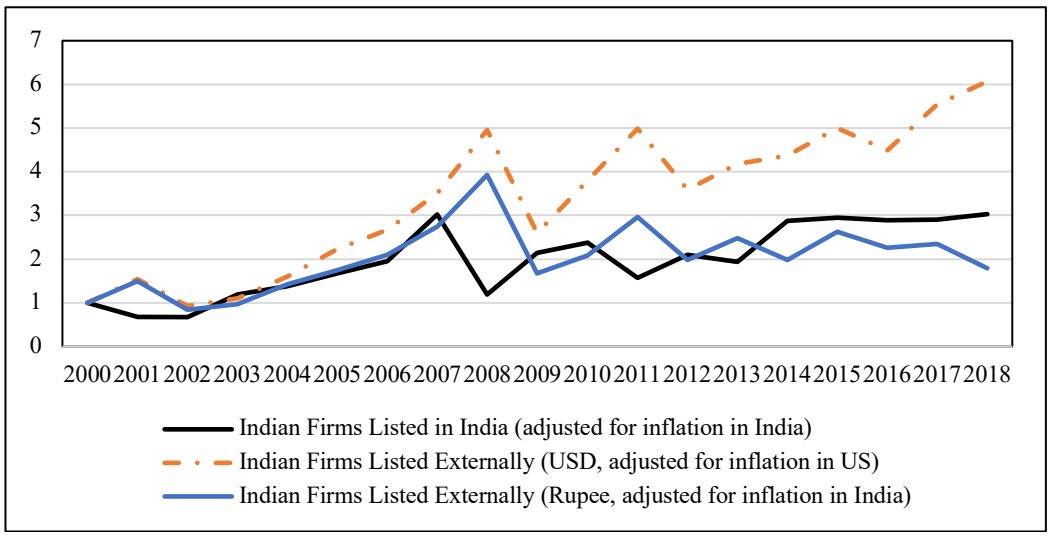
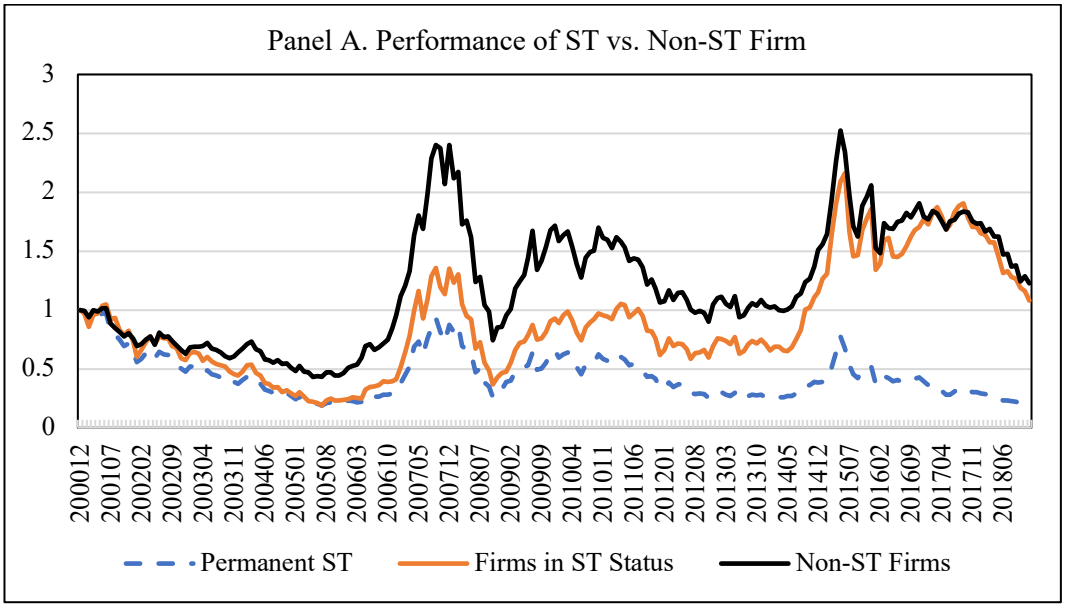


Figure IA6. BHRs of "Special Treatment" (ST) Firms in the A Share Market

Panel A plots the cumulative, buy-and-hold returns of A share firms that received the "special treatment" ("ST firm") status and those that never receive this status ("non-ST firm") during the sample period of 2000-2018. We further define an ST firm as a "Permanent ST" if after receiving the special treatment status, it did not re-emerge from the "ST" status during the rest of the sample period (till the end of 2018). Panel B plots the cumulative, buy-and-hold returns of all A share firms and A share firms excluding the ST firms (including all the observations from the time of receiving the ST status until the time re-emerging from this status).



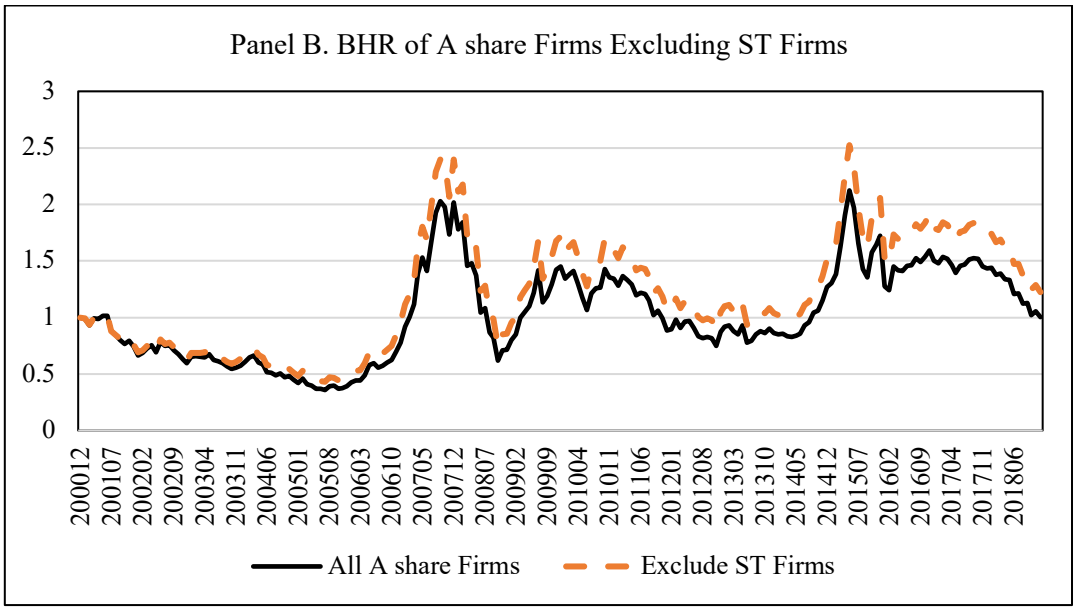


Figure IA7. Validating the AH Premium Measures

This figure plots the AH premium measure estimated in three approaches. First, we follow Jia, Wang, and Xiong (2017) and construct the monthly AH premium, using stocks cross-listed in the A share and HK markets, as (A share price in USD)/(H share price in USD) × 100; to obtain market-level AH premium, we take value-weighted average across all AH cross-listed firms, with the total market capitalization of the A and H shares as the weight. Second, the black solid line is the Hang Seng Stock Connect China AH Premium Index (*"HSAHP"*, available since 2016, see https://www.hsi.com.hk/eng/indexes/all-indexes/ahpremium). Third, we follow the HSAHP approach to replicate the measure for 2016-2018, as the blue dotted line shows.

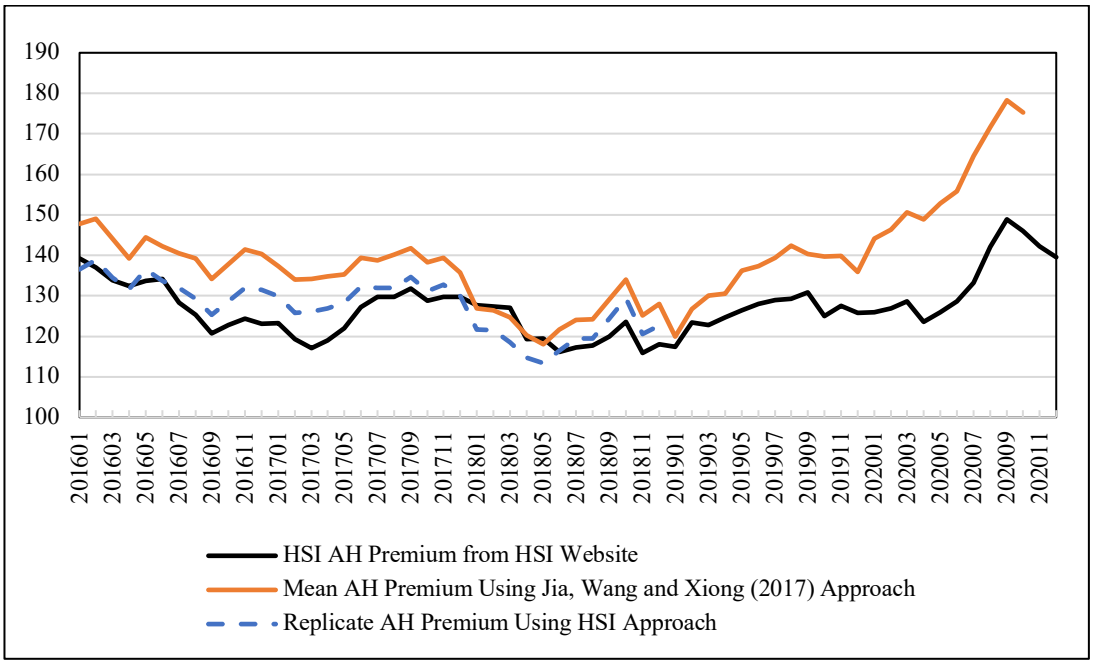


Figure IA8. Comparing Corporate Governance of Small vs. Large A Share Firms

This figure plots the average values of G-Index-A for small and large A share firms over the sample period. Small and large firms are determined by the 30th and 70th percentile points in the lagged-one-year market capitalization by year.

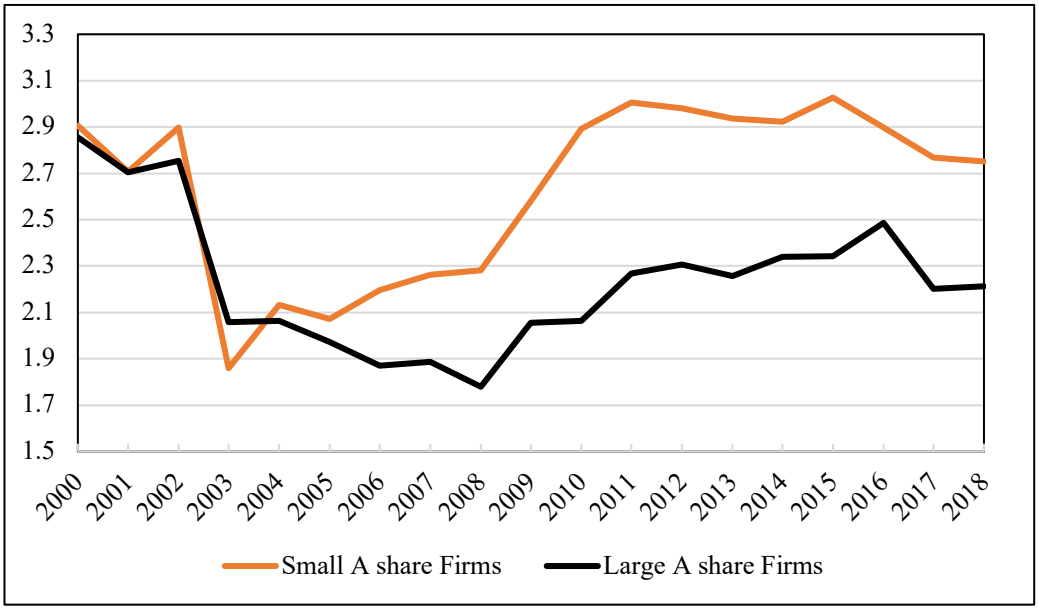


Figure IA9. Comparing Stock Return Volatilities: A Share Firms, Externally Listed Chinese Firms, and Firms Listed in Other Large Markets

This figure plots the annualized stock return volatilities for A share firms, externally listed Chinese firms, and firms listed in other large countries. For A share firms and US-listed firms, we estimate return volatilities from *daily* returns. The stock return data for Chinese firms and US firms are from WIND and CRSP, respectively. For firms listed in the other countries, return volatilities are estimated from *weekly* returns obtained from Bloomberg. We take two steps in estimating return volatilities: first, for each country/region, we estimate the daily (weekly) returns of the market portfolio by taking weighted average of stock returns within that country/region, with the lagged-one-day (week) market capitalization as the weights; next, we estimate the standard deviations of daily (weekly) returns of the market portfolio by country/region and then annualize them. We pool all externally listed Chinese firms into one group, using lagged market capitalization in US dollars as the weight.

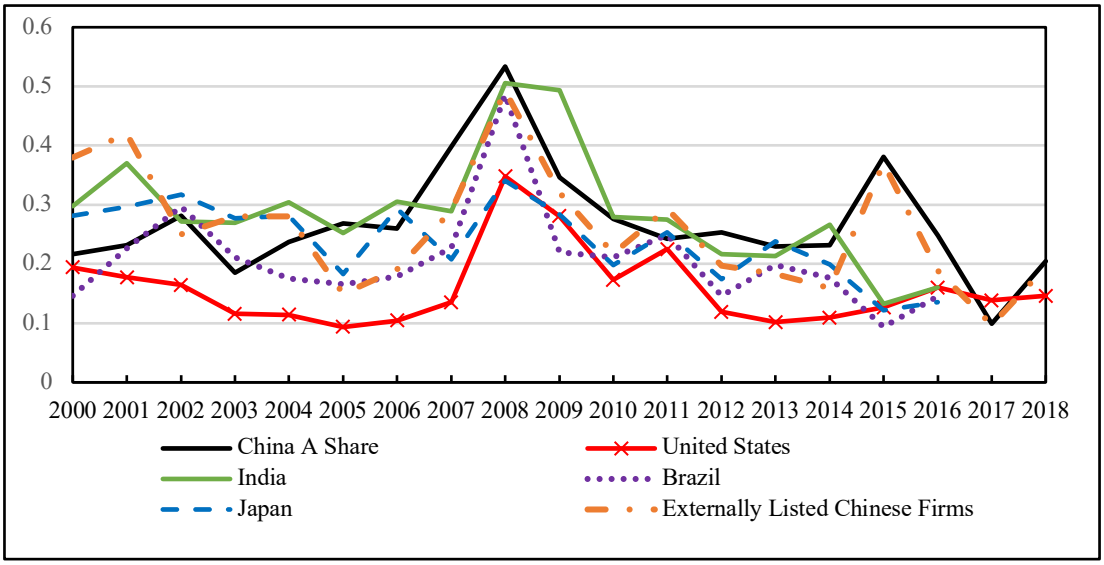


Figure IA10. Comparing M/B Ratios of A Share Firms, Externally Listed Chinese Firms, and Firms Listed in Other Large Markets

This table plots the value-weighted M/B ratios of A share firms, firms listed in other large markets, and externally listed Chinese firms. For each market in each year, we calculate the value-weighted average market capitalization-to-book equity ratio across firms, with the lagged one-year total assets as the weight. For externally listed Chinese firms, we convert their market capitalization and book equity into USD. We restrict the sample to firms with non-missing market capitalization, book equity and total assets.

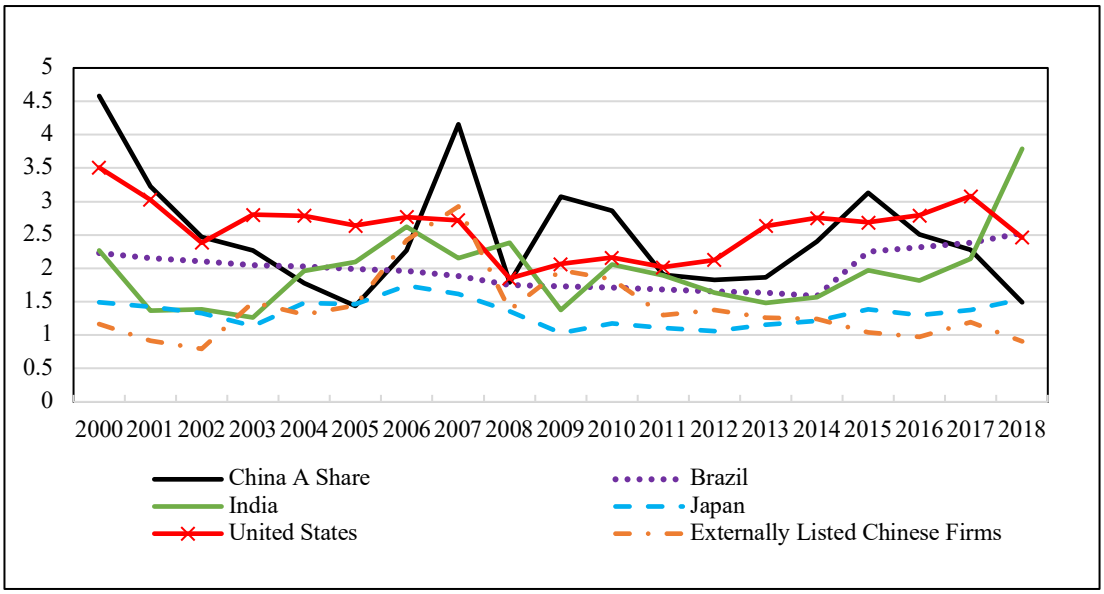


Table IA1. More Tests on Stock Returns: Alternative Return Measures and OLS Regressions

This table examines the stock performance of A share firms, firms listed in other countries and externally listed Chinese firms. In Panels A-D, the dependent variable is the ***natural logarithm*** of *annual* stock returns in real terms, including cash dividends and adjusted for stock splits and inflation. We employ WLS regressions where we use the lagged-one-year market capitalization as the weight. Panels A-C employ the cross-country sample. Panel D employs the A share sample. Country- and firm-level controls are the same as those used in Table 2, Panel A, Column 4. In Panel E, the dependent variable is annual stock returns in percentage points, and we report *OLS* estimates: we delete firms with stock returns below the 1st percentile points determined by country and year. *t*-statistics calculated using the standard errors clustered by industry and year are reported in the parentheses. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels.

Panel A. Underperformance of A share Listed Firms				
Dependent variable: Log (1+Annual Stock Return); Regression type: WLS				
	1991-2018		2000-2018	
Variable	(1)	(2)	(3)	(4)
A share Listed	-0.162***	-0.160***	-0.177***	-0.178***
	(-3.258)	(-3.105)	(-3.343)	(-3.220)
Country/Firm Controls	Yes	Yes	Yes	Yes
Industry FE	Yes	No	Yes	No
R-squared (%)	4.32	4.22	4.3	4.16
Observations	686,886	683,609	495,651	495,651

Panel B. Performance of Externally Listed Chinese Firms				
Dependent variable: Log (1+Annual Stock Return); Regression type: WLS				
	1991-2018		2000-2018	
Variable	(1)	(2)	(3)	(4)
Externally Listed Chinese Firms	-0.006	0.025	0.012	0.035
	(-0.145)	(0.583)	(0.253)	(0.776)
Country/Firm Controls	Yes	Yes	Yes	Yes
Industry FE	Yes	No	Yes	No
R-squared (%)	3.25	4.56	3.47	4.52
Observations	686,886	683,609	495,651	495,651

Panel C. Performance of Listed Firms: Excluding IPO Years				
Dependent variable: Log (1+Annual Stock Return); Regression type: WLS				
	1991-2018		2000-2018	
Variable	(1)	(2)	(3)	(4)
A share Listed	-0.070		-0.131*	
	(-1.092)		(-1.933)	
Externally Listed Chinese Firms		0.070*		0.102**
		(1.705)		(2.366)
Country/Firm Controls	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
R-squared (%)	13.73	13.74	15.23	15.21
Observations	646,631	646,631	465,589	465,589

Panel D. Comparing Small vs. Large, SOE vs. Non-SOE A share Firms		
Dependent variable: Log (1+Annual Stock Return); Regression type: WLS		
Variable	(1)	(2)
Large	-0.099***	
	(-3.802)	
SOE		0.029
		(1.234)
Firm Controls	Yes	Yes
Industry FE	Yes	Yes
R-squared (%)	7.99	7.83
Observations	36,044	36,044

Panel E. Underperformance of A share Listed Firms: Delete Stock Returns <1st percentile				
Dependent variable: Annual Stock Returns in Percentage Points; Regression type: OLS				
	1991-2018		2000-2018	
Variable	(1)	(2)	(3)	(4)
A share Listed	-17.717***	-10.428*	-11.993*	-7.999
	(-3.125)	(-1.811)	(-1.936)	(-1.286)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
R-squared (%)	4.10	5.35	3.26	5.87
Observations	905774	833386	668760	625368

Table IA2. The Performance of Hong Kong-Listed Chinese Firms

This table compares the performance of Hong Kong listed Chinese firms with firms listed in the other countries. The dependent variable is the annual stock returns, adjusted for stock splits and inflation. *HK Listed Chinese Firms* is an indicator taking the value of 1 if the firm is headquartered in mainland China and listed in HKEX. We delete Chinese firms listed in external markets other than HK from the sample. Control variables are the same as we used in Table 2, Panel B of the revised paper. We employ WLS regressions where we use the lagged-one-year market capitalization as the weight. *t*-statistics calculated using the standard errors clustered by industry and year are reported in the parentheses. ***, ** and * denote the statistical significance at the 1%, 5% and 10% level.

	1991-2018		2000-2018	
Variable	(1)	(2)	(3)	(4)
HK Listed Chinese Firms	11.928**	4.513	5.964	3.241
	(2,088)	(0.812)	(1.052)	(0.577)
Year/Ind FEs	Yes	Yes	Yes	Yes
Country Controls	Yes	Yes	Yes	Yes
Firm Controls	No	Yes	No	Yes
R-squared (%)	7.32	4.42	3.95	5.06
Observations	673,405	672,982	484,819	484,819

Table IA3. Performance of Externally Listed *Indian* Firms

This table compares the stock returns and operating performance of domestically listed and externally listed Indian firms from 2000 to 2018. *India Listed* is an indicator that equals 1 if an Indian firm is domestically listed, and 0 otherwise. Annual stock returns are in percentage points and adjusted for stock splits and inflation in the listing country. *Investment* is measured as capital expenditure scaled by total assets in the same year. *OCF* is calculated as (EBITDA – Change in Working Capital – Income Taxes)/Total Assets. *NCF* is calculated as (Operating Cash Flow – Capital Expenditure)/Total Assets. In stock return regressions (Columns 1 and 2), we use WLS regressions with the lagged-one-year market cap as the weight. In operating performance regressions (Columns 3 to 5), we run OLS regressions. Financial information and stock returns are from Worldscope and Datastream. Data for Indian firms listed in US are from Compustat and CRSP. *t*-statistics calculated using the standard errors clustered by industry and by year are reported in the parentheses. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels.

	Returns	Returns	Investment	OCF	NCF
Variable	(1)	(2)	(3)	(4)	(5)
India Listed	-1.580	-14.007	0.471	1.424***	1.078**
	(-0.245)	(-1.099)	(0.572)	(3.498)	(1.995)
Log (Total Assets)		-3.474**	0.164	0.127***	-0.0168
		(-2.265)	(0.883)	(2.892)	(-0.224)
Leverage		-5.673	1.690**	2.518***	0.193
		(-0.423)	(2.008)	(3.818)	(0.245)
Log (Firm Age)		-7.349**	-0.664***	0.179**	0.886***
		(-2.380)	(-4.128)	(2.197)	(6.598)
Sales Growth		0.039	0.712**	0.041	-0.555**
		(1.632)	(2.265)	(0.215)	(-2.213)
ROA		10.696*	15.123***	61.725***	47.025***
		(1.644)	(7.711)	(61.725)	(24.213)
Country Controls	No	Yes	Yes	Yes	Yes
Year and Industry FE	No	Yes	Yes	Yes	Yes
R-squared (%)	0.026	24.94	13.35	32.10	12.85
Observations	20,418	20,418	17,977	17,946	17,216

Table IA4. Changes in Non-tradable Shares during the Split-share Reform

This table shows the number and percentage of A share firms with non-tradable shares (NTS) before and after the SSR in China. We count the number of firms with the ratio of NTS to total shares exceeding 40%. The bottom row shows the average NTS ratio before, during and after the reform.

	2000-2004 (before)	2005-2007 (reform period)	2007-2018 (after)
# firms with NTS>=40%	1319	995	768
% of all firms	95.51%	63.58%	21.11%
Average % NTS	60.86%	52.18%	28.47%

Table IA5. Operating Performance of A share Firms around the Split-share Reform

This table estimates the effect of the SSR on firms' operating performance. Dependent variables are scores on state ownership and RPT, and operating performance measures, annual ROIC and NCF. *Reduction in State Ownership* equals 1 if the firm's state ownership is less than 40%, and 0 otherwise. *Outflow RPT?* equals 1 if the firm has RPT net outflows in a year, and 0 otherwise. Independent variables of interest are the interaction of the *NTS Firm* indicator and the *Post* indicator, and the interaction of *Decline in NTS* and *Post*. *NTS Firm* is an indicator that equals 1 if the firm has NTS before 2005, and 0 otherwise. *Post* is an indicator taking the value of 1 if the firm-year is after 2007. *Decline in NTS* is the decline in the ratio of non-tradable shares out of total shares from the end of 2004 to 2007. Sample period is 2000-2018. *t*-statistics calculated using the standard errors clustered by industry and year are reported in the parentheses. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels. See variable definitions in Appendix A of the paper.

	Reduction in State Ownership		Outflow RPT?		ROIC		NCF	
Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Post × NTS Firm	0.115***		0.687		-0.022		0.812	
	(7.592)		(0.642)		(-0.073)		(1.526)	
NTS Firm	-0.119		-0.028***		-0.507		0,409	
	(-11.115)		(-3.052)		(-1.633)		(1.033)	
Post × Decline in NTS		0.037		0.039		-0.663		-2.411*
		(0.633)		(0.972)		(-1.064)		(-1.792)
Decline in NTS		0.157***		-0.015		0.779		1.802
		(4.162)		(-0.523)		(1.572)		(1.632)
Intercept	1.541***	1.401***	1.282***	1.328***	0.017	0.555	-12.643***	-12.916***
	(7.592)	(19.792)	(38.911)	(33.842)	(1.442)	(0.645)	(-8.477)	(-7.225)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared (%)	21.38	16.55	7.98	7.88	24.93	17.07	4.62	4.47
Observations	36,048	22,855	36,048	22,855	33,117	22,716	34,459	21,629

Table IA6. Stock Market Reaction to the Split-share Reform

This table examines the effects of the decline in non-tradable shares (NTS) and the change in governance on short-term and long-term stock returns following the SSR. In Panel A, the dependent variable is the 1-day, 3-day and 5-day cumulative abnormal returns (CARs) following the announcement of the reform on April 29, 2005. The independent variable of interest is *Fraction of NTS in 2004*, the fraction of NTS out of total shares measured as of 2004. In Panel B, the dependent variables are the CARs for one year (from April 29, 2005), two years, and five years. We calculate the CARs using the contemporaneous value-weighted returns of all A share stocks as the benchmark. *Decline in NTS* is the fraction of NTS measured in 2007 subtracting the fraction of NTS at the end of 2004. In Columns 1 and 2, *Increase in G-Index-A* is a firm's G-Index-A measured in 2005 subtracting the index value in 2004. In Columns 3-4 (Columns 5-6), we use G-index-A in 2006 (2007) subtracting the value in 2004 to estimate *Increase in G-Index-A*. Change in ROIC is the ROIC in 2007 subtracting that in 2004. *Pre-reform Returns* is the average stock return measured over 200 days to 31 days before the announcement date. *t*-statistics calculated using the standard errors clustered by industry are reported in the parentheses. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels. See variable definitions in Appendix A of the paper.

Panel A. Stock Market Reaction to the Reform

	1-day CAR	3-day CAR	5-day CAR
Variable	(1)	(2)	(3)
Fraction of NTS in 2004	0.919	2.016*	2.174**
	(1.254)	(1.866)	(2.155)
Firm Controls in 2004	Yes	Yes	Yes
Pre-reform Returns	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes
R-squared (%)	9.16	8.53	7.18
Observations	1,156	1,115	1,064

Panel B. Long-term Stock Returns after the Reform

	CAR 1-year	CAR 1-year	CAR 2-year	CAR 2-year	CAR 5-year	CAR 5-year
Variable	(1)	(2)	(3)	(4)	(5)	(6)
Decline in NTS		81.37***		-29.23		117.75
		(7.742)		(-1.278)		(1.205)
Decline in NTS		28.05***		0.058		99.05***
×Increase in G-Index-A		(3.324)		(0.022)		(3.382)
Increase in G-Index-A	1.16***	0.37	10.82***	10.61***	66.52***	42.049
	(3.052)	(1.465)	(5.872)	(2.663)	(2.705)	(1.513)
Change in ROIC	105.72***	104.02***	434.66***	431.41***	166.89***	166.28***
	(6.495)	(6.093)	(4.907)	(4.903)	(9.422)	(9.982)
Turnover before Reform	-2.64***	-3.05***	-3.53	-3.34	17.52	15.86
	(-4.009)	(-4.712)	(-0.792)	(-0.754)	(1.611)	(1.255)
Firm Controls in 2004	Yes	Yes	Yes	Yes	Yes	Yes
Pre-reform Returns	Yes	Yes	Yes	Yes	Yes	Yes
Year/Ind/Firm Location FEs	Yes	Yes	Yes	Yes	Yes	Yes
R-squared (%)	18.21	21.72	21.46	21.52	17.73	18.23
Observations	1,002	1,002	1,002	1,002	1,002	1,002

Table IA7. Comparison of Operating Cash Flows and Net Cash Flows of A Share and Externally Listed Chinese Firms

This table compares the average operating cash flows (OCF) and net cash flows (NCF), both adjusted for inflation, of A share firms and externally listed Chinese firms in different sub-periods during 2000-2018. OCF and NCF are averaged across firms with total assets as the weight. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels, respectively. See variable definitions in Appendix A of the paper.

Average OCF and NCF in Real Terms by Period								
	Externally Listed Chinese Firms			A Share Firms			Difference	
Period	OCF in Real Terms	NCF in Real Terms	N	OCF in Real Terms	NCF in Real Terms	N	Difference in OCF	Difference in NCF
2000-04	0.104	0.069	2,161	0.084	0.008	6,033	0.020***	0.061***
2005-07	0.080	0.054	2,521	0.078	-0.014	4,336	0.002*	0.068***
2008-12	0.053	0.042	6,024	0.017	-0.021	10,273	0.036***	0.063***
2013-18	0.036	0.028	9,577	0.012	-0.009	18,174	0.024***	0.037***
Total	0.050	0.039	20,283	0.016	-0.011	38,816	0.034***	0.050***

Table IA8. Operating Performance around IPO: By Cohorts

This table presents the OLS regression results for changes in ROA and ROS around IPO for listed firms in our cross-country sample. We split the sample firms into different cohorts by their IPO years: Cohorts 2000-2003 (firms with IPO years during 2000-2003), Cohorts 2004-2006, Cohorts 2007-2009, Cohorts 2010-2014, and Cohorts 2015-2018. We calculate the changes in ROA and ROS from year *t-1* to year *t+1*, and from year *t-2* to year *t+2*; year *t* represents the IPO year. Panels A and B report earnings change during the 1-year and 2-year windows around IPO, respectively. The independent variable of interest is the *A Share Listed* indicator. The control variables are the same as those in Table 5, Panel A of the paper. *t*-statistics are calculated from standard errors clustered by industry and year. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels. Variable definitions are in Appendix A of the paper.

Panel A. Earnings Drop [-1,+1] Year around IPO

	Change in ROA [-1,+1]				
	2000-2003	2004-2006	2007-2009	2010-2014	2015-2018
	(1)	(2)	(3)	(4)	(5)
A share Listed	-0.027*	-0.018*	-0.023*	-0.037***	-0.010*
	(-1.850)	(-1.688)	(-1.665)	(-6.509)	(-1.833)
Year/Ind FEs	Yes	Yes	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes	Yes	Yes
R-squared (%)	3.98	3.55	6.37	5.54	6.91
Observations	5,474	7,803	7,477	9.369	4,474

	Change in ROS [-1,+1]				
	2000-2003	2004-2006	2007-2009	2010-2014	2015-2018
	(6)	(7)	(8)	(9)	(10)
A share Listed	-0.054	-0.001	-0.008	-0.017**	-0.042**
	(-1.548)	(-0.042)	(-0.311)	(-2.054)	(-2.177)
Year/Ind FEs	Yes	Yes	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes	Yes	Yes
R-squared (%)	2.43	0.89	1.81	1.16	0.55
Observations	3,957	5,846	5,392	7,386	4,409

Panel B. Earnings Drop [-2,+2] Year around IPO

	Change in ROA [-2,+2]				
	2000-2003	2004-2006	2007-2009	2010-2014	2015-2018
	(1)	(2)	(3)	(4)	(5)
A share Listed	-0.031*	-0.021	-0.014	-0.056***	-0.027
	(-1.649)	(-1.098)	(-1.243)	(-5.267)	(-1.533)
Year/Ind FEs	Yes	Yes	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes	Yes	Yes
R-squared (%)	4.36	5.61	2.44	5.45	7.53
Observations	6,176	5,873	5,992	7,438	2,338

	Change in ROS [-2,+2]				
	2000-2003	2004-2006	2007-2009	2010-2014	2015-2018
	(6)	(7)	(8)	(9)	(10)
A share Listed	-0.062*	-0.021	-0.005	-0.033***	-0.048
	(-1.813)	(-1.311)	(-0.213)	(-2.598)	(-0.998)
Year/Ind FEs	Yes	Yes	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes	Yes	Yes
R-squared (%)	3.41	3.24	1.39	4.44	1.84
Observations	3,576	3,361	3,282	4,938	1,792

Table IA9. IPO Returns of Firms Dual-listed in the A Share and Hong Kong Markets

This table compares the IPO returns over the first day, first-month, and first-year horizons of firms listed in the A share, or the Hong Kong markets. *A Share Listed* is an indicator taking the value of 1 if the observation is the stock listed in the A share market. *Tech Industry* is an indicator taking the value of 1 if the firm belongs to the technology sector (CSRC industry classification I63, I64, I65, and C27). The dependent variable is the raw return of IPO stocks. We employ WLS regressions where we use market capitalization on the IPO day/month/year as the weight. *t*-statistics calculated using the standard errors clustered by industry and year are reported in the parentheses. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels.

Panel A. IPO First-day Returns				
Variable	(1)	(2)	(3)	(4)
A share Listed	0.324***	0.666***	0.666***	0.702***
	(6.245)	(2.577)	(2.556)	(2.933)
Tech Industry			0.002	0.005
			(0.054)	(0.162)
Log (Total Assets)		0.050	0.050	0.051
		(0.779)	(0.765)	(0.879)
Log (Proceeds)		-0.095*	-0.095*	-0.103**
		(-1.779)	(-1.766)	(-2.177)
Crisis				0.338***
				(1.998)
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
R-squared (%)	48.05	34.77	49.42	50.24
Observations	4,550	4,539	4,539	4,539

Panel B. IPO First-month Returns				
Variable	(1)	(2)	(3)	(4)
A share Listed	0.833***	1.818***	1.819***	1.855***
	(3.954)	(2.886)	(2.866)	(3.054)
Firm Controls	No	Yes	Yes	Yes
Tech Ind FE	No	No	Yes	Yes
Crisis Indicator	No	No	No	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
R-squared (%)	39.27	42.54	42.54	42.70
Observations	4,506	4,495	4,495	4,495

Panel C. IPO First-year Returns				
Variable	(1)	(2)	(3)	(4)
A share Listed	0.174	2.354***	2.406***	2.187***
	(1.311)	(3.533)	(3.389)	(2.877)
Firm Controls	No	Yes	Yes	Yes
Tech Ind FE	No	No	Yes	Yes
Crisis Indicator	No	No	No	Yes
Year FE	Yes	Yes	Yes	Yes
Industry FE	Yes	Yes	Yes	Yes
R-squared (%)	34.79	41.29	42.72	46.57
Observations	4,080	4,069	4,069	4,069

Table IA10. Underperformance of A Share Firms in Returns: Drop the ST Firms

This table shows the estimated coefficients of the comparisons between A share firms and firms listed in other countries. In Columns 1 to 3, we drop (A share) ST firms, SOE ST firms and non-SOE ST firms from the sample, respectively. Thus, the samples that enter the regressions in Columns 1 to 3 are (i): all non-ST firms; (ii) all non-ST and non-SOE ST; (iii) all non-ST and SOE ST. ST firms refer to firms that receive "special treatment" status during the sample period 2000-2018. The rest of the model specifications are similar to those in Table 2, Panel A of the revised paper. We employ WLS regressions where we use the lagged-one-year market capitalization as the weight. *t*-statistics calculated using the standard errors clustered by industry and year are reported in the parentheses. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels.

	Non-ST	Non-ST & non-SOE ST	Non-ST& SOE ST
Variable	(1)	(2)	(3)
A share Listed	-12.997***	-12.755***	-12.788***
	(-3.265)	(-3.637)	(-3.648)
Difference in Coefficients (2) and (3)		0.033	
		(0.007)	
Firm and Country Controls	Yes	Yes	Yes
Year/Ind FE	Yes	Yes	Yes
R-squared (%)	4.51	4.66	4.67
Observations	485,792	490,408	491,035

Table IA11. Comparing Operating Performance of Large, Medium and Small A Share Firms and Matched Unlisted Firms

This table compares the operating performance of large, medium and small A share firms and their matched unlisted Chinese firms. For each A share firm, we look for a matched unlisted firm with the nearest asset size from the same industry. We require the ratio of total assets of the A share firm and that of its matched unlisted firms to be within the [80%, 120%] range. We divide the matched sample of A share firms, externally listed Chinese firms and matched unlisted firms into large, medium and small groups based on the 30th and 70th percentiles in total assets of A share firms. We control for the same firm characteristics as we use in Table 7, Panel C, and include year and industry fixed effects in all specifications. *t*-statistics calculated using the standard errors clustered by industry and year are reported in the parentheses. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels. See variable definitions in Appendix A of the paper.

Panel A. Large A share Firms and Matched Unlisted Firms

	Investment	OCF	NCF
Variables	(1)	(2)	(3)
A share Listed	1.154	0.599	-0.010
	(1.402)	(0.040)	(-0.011)
Year/Ind/Location FEs	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes
R-squared (%)	17.86	15.61	10.09
Observations	4,946	4,944	4,944

Panel B. Medium A share Firms and Matched Unlisted Firms

	Investment	OCF	NCF
Variables	(1)	(2)	(3)
A share Listed	0.647	-5.451***	-7.553***
	(1.005)	(-4.382)	(-4.182)
Year/Ind/Location FEs	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes
R-squared (%)	16.61	10.96	7.39
Observations	8,467	8,319	8,484

Panel C. Small A share Firms and Matched Unlisted Firms

	Investment	OCF	NCF
Variables	(1)	(2)	(3)
A share Listed	1.428**	-7.962**	-6.722***
	(2.035)	(-2.277)	(-3.963)
Year/Ind/Location FEs	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes
R-squared (%)	18.33	6.98	7.97
Observations	4,771	4,329	4,397

Table IA12. RPTs, Stock Returns and Operating Performance of A Share Firms

This table reports the estimated effects of A share firms' RPT activities on their investment, operating performance, and stock returns. The dependent variables are operating performance and stock returns in year *t+1*; all the dependent variables are multiplied by 100 and in *percentage points*. The independent variable *RPT Amt Out* is calculated as the amount of money outflow, i.e., the amount of money paid out by the listed firm in its RPTs, divided by total assets as of year *t*. Loan-based RPTs include a listed firm's lending to or borrowing from controlling shareholders or other related parties (RPT type "05" in CSMAR), and providing or receiving loan guarantees to related parties (RPT type "06" in CSMAR). We collect information on individual RPT announcements from CSMAR and aggregate the amount of all RPTs to firm-year level. We control for other firm characteristics measured as of year *t*. We also control for year, industry and firm location (at province level) fixed effects in all the specifications. For stock return regressions (Column 4), we employ WLS models where we use the lagged-one-year market cap as the weights. For investment and operating performance regressions (Columns 1 to 3), we run OLS models. *t*-statistics calculated using the standard errors clustered by industry and year are reported in the parentheses. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels. See other detailed variable definitions in Appendix A of the paper.

	Investment	Operating Cash Flows	Net Cash Flows	Stock Returns
Variable	(1)	(2)	(3)	(4)
RPT Amt Out	-0.690***	-2.199***	-1.696***	-6.639**
	(-3.011)	(-4.129)	(-3.511)	(-2.388)
Year/Industry/Location FEs	Yes	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes	Yes
R-squared (%)	16.01	9.97	4.49	60.69
Observations	33,200	31,788	31,788	31,711

Table IA13. Comparison of Different Factors on Stock Returns: Portfolio Sorting

This table compares the effects of corporate governance and investor behavior factors on stock returns using the portfolio sorting approach. Panels A1 and A2 compare the annual stock returns in the cross-country sample for high versus low governance groups (G-Index-I), and for high versus low sentiment groups (measured by the $Sentiment_1$ variable, available in 58 countries). In Panel A1, we use the 25th or the 75th percentage points to form the governance (or lagged-one-year sentiment) portfolios; in Panel A2, we form the medium portfolio by grouping firms within the [45th, 55th] percentile points. Then we move up and down by one standard deviation in governance (or $Sentiment_1$) to form the low and high portfolios. The cutoff points vary by country and year. We take the value-weighted averages of monthly returns in real terms to form each portfolio, with the lagged-one-month market cap as the weight. Panels B1 and B2 report the portfolio sorting results for A share firms. We use stock-level governance (G-Index-A) and lagged-one-year turnover to form portfolios using the same approach as in Panels A1 and A2. The cutoff points vary by month for sentiment and turnover measures. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels, and the *t*-statistics of the difference of different groups is reported in the parenthesis below. See other detailed variable definitions in Appendix A of the paper.

Panel A1. Cross-country Sample: Double Sorting by 25th and 75th Percentile Points

Low Governance	Medium Governance	High Governance	High Governance – Low Governance
6.48	9.61	7.55	1.07***
			(3.72)
Low Sentiment	Medium Sentiment	High Sentiment	Low Sentiment – High Sentiment
7.50	16.34	4.31	3.19***
			(21.93)
		Diff-in-Diff	-2.12***
			(-6.57)

Panel A2. Cross-country Sample: Double Sorting by One Standard Deviation Change

Low Governance	Medium Governance	High Governance	High Governance – Low Governance
-1.10	7.52	6.87	7.97***
			(11.79)
Low Sentiment	Medium Sentiment	High Sentiment	Low Sentiment – High Sentiment
16.58	16.57	9.89	6.69***
			(27.91)
		Diff-in-Diff	1.28*
			(1.78)

Panel B1. A Share Firms' Monthly Stock Returns: Double Sorting by 25th and 75th Percentile Points

Low Governance	Medium Governance	High Governance	High Governance– Low Governance
-0.98	-0.12	-0.01	0.97***
			(6.57)
Low Turnover	Medium Turnover	High Turnover	Low Turnover – High Turnover
-0.20	-0.21	-0.52	0.32***
			(4.75)
		Diff-in-Diff	0.65***
			(3.97)

Panel B2. A Share Firms' Monthly Stock Returns: Double Sorting by One Standard Deviation Change

Low Governance	Medium Governance	High Governance	High Governance – Low Governance
-0.41	0.81	-0.32	0.09
			(1.32)
Low Turnover	Medium Turnover	High Turnover	Low Turnover – High Turnover
-0.20	-0.24	-0.52	0.32***
			(5.13)
		Diff-in-Diff	-0.23**
			(-2.48)

Table IA14. Comparing Return Factors on Stock Returns: *Portfolio* Regressions

This table examines the stock performance of low-governance firms using pooled portfolio OLS regressions following Qian and Zhu (2018). For each country in each year, we form portfolios by the G-Index-I quintiles. We define firms in the lowest governance quintile as the *Low Governance* group. *High Sentiment$_1$* is an indicator taking one if the sentiment measure is in the highest quintile. In Columns 3-5, we employ the sample of stocks from 58 countries for which the *Sentiment$_1$* variable is available; in Column 6, we use the sample of stocks from 17 countries for which the *Sentiment$_2$* variable is available. The dependent variables are portfolio-level annual stock returns (in percentage) calculated as the value-weighted individual stock returns in real terms, with the lagged-one-year market capitalization as the weight. We include the same country-year controls as we use in Table 2, Panel A. We also include the Fama-French 5 factors as controls. *t*-statistics are reported in the parentheses. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels.

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Low Governance	-6.083**	-6.652**	-5.959**	-6.531**	-6.079**	-6.250**
	(-2.325)	(-2.509)	(-2.274)	(-2.462)	(-2.275)	(-2.322)
A Share Listed		-18.531**		-18.954**	-22.266***	-21.877***
		(-2.225)		(-2.265)	(-2.729)	(-2.708)
High Sentiment$_1$			4.688	5.055	5.597	
			(1.209)	(1.302)	(1.402)	
High Sentiment$_2$						-3.369*
						(-1.865)
Country Controls	Yes	Yes	Yes	Yes	Yes	Yes
FF5 Factors	Yes	Yes	Yes	Yes	No	Yes
R-squared (%)	11.45	11.89	11.58	12.04	9.72	11.95
Observations	2,271	2,271	2,271	2,271	2,271	886

Table IA15. Comparing Return Factors: Additional Tests

This table presents additional tests for the effects of corporate governance (G-Index-A) and investor behavior factors on stock returns. The dependent variables are *annual* stock returns in real terms and percentage points. We construct two investor behavior bias measures: (i) *Abnormal Turnover*; (ii) *Residual AH Premium*. Both measures are lagged one year when entering the regressions. *Abnormal Turnover* is estimated as the ratio of turnover in year *t-1* over turnover in year *t*-2. *Residual AH Premium* is the estimated residual from regressing the AH premium on the natural logarithm of the maximum number of shares to be short sold in the A share and HK stock markets, and the real interest rates of mainland China and Hong Kong. *Residual AH Premium* is available since 2010, as short-selling data became available after 2009. All explanatory variables are normalized through dividing the original values by their standard deviations. In Panel A, we employ WLS regressions where we use the lagged-one-year market capitalization as the weight. In Panels B and C, we run OLS regressions on the same (winsorized) sample as that in Table IA1, Panel E. *t*-statistics calculated using the standard errors clustered by industry and year are reported in the parentheses. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels.

Panel A. A share Sample: Alternative Measures for Investor Behavior					
Variable	(1)	(2)	(3)	(4)	(5)
G-Index-A				1.451**	2.099***
				(2.325)	(2.996)
Abnormal Turnover	-1.488**			-1.460	
	(-2.039)			(-1.309)	
Residual AH Premium		-7.992*			-8.309*
		(-1.822)			(-1.881)
Δ ROA [-1, +1]			0.931**	0.815**	1.330***
			(2.095)	(2.082)	(3.782)
ST Firm	-5.475**	-6.873***	-6.831***	-4.649**	-5.737***
	(-2.205)	(-2.575)	(-3.812)	(-2.066)	(-2.686)
Year FE	Yes	No	Yes	Yes	No
Firm Location FE	Yes	Yes	Yes	Yes	Yes
Matured/New Ind FE	Yes	Yes	Yes	No	Yes
Industry FE	No	No	No	Yes	Yes
Firm Controls	Yes	Yes	Yes	Yes	Yes
R-squared (%)	53.07	5.78	52.30	53.32	6.53
Observations	31,632	23,049	37,809	31,660	21,437

Panel B. Cross-country Sample: OLS Estimates

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
G-Index-I	1.674***				1.623***	1.924***	1.998***	1.689***
	(2.766)				(2.792)	(3.265)	(3.412)	(2.688)
$Sentiment_1$		-3.088*			-2.957*			
		(-1.906)			(-1.833)			
$Sentiment_2$			-5.542**			-5.196**		-5.238**
			(-2.188)			(-2.098)		(-2.115)
ΔROA [-1, +1]				1.499**			1.938**	1.767**
				(2.045)			(2.409)	(2.183)
ROIC								4.198***
								(11.588)
A share Listed	-7.378	-0.954	-6.936	-8.361	0.251	-7.627	-6.924	-3.514
	(-1.176)	(-0.133)	(-0.855)	(-1.345)	(0.035)	(-0.977)	(-1.109)	(-0.425)
Year/Ind. FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country/Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared (%)	6.91	6.68	7.02	6.91	6.70	6.06	5.93	7.18
Observations	588,106	505,998	485,937	588,193	505,998	508,393	621,117	483,633

Panel C. A share Sample: OLS Estimates

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
G-Index-A	1.051***				1.077***	1.037***	1.044***	0.455
	(3.009)				(2.733)	(2.911)	(2.933)	(1.277)
AH Premium		-0.422			1.169			
(Industry-level)		(-0.052)			(0.766)			
Stock-level Turnover			-2.236***			-2.058***	-2.082***	-0.788
			(-3.478)			(-3.123)	(-3.165)	(-1.092)
Δ ROA [-1, +1]				0.791***			0.763***	0.196
				(3.843)			(3.612)	(0.895)
ROIC								11.581***
								(10.403)
Ind./Location FEs	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year FE	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Controls	No	Yes	No	No	No	No	No	No
R-squared (%)	61.96	14.91	63.28	61.96	62.33	63.30	63.31	64.94
Observations	35,364	27,714	33,777	35,336	27,714	33,777	33,777	31,136

Table IA16. Comparing Return Factors: Using *Monthly* Returns

This table reports results of comparing the effects of institutional factors and investor behavioral factors for monthly stock return samples. Dependent variables are monthly returns adjusted for inflation and stock splits. Panel A employs the sample of A share-, HK- and US-listed stocks. We use G-Index-I as the measure corporate governance. We use $Sentiment_1$ as the measure for investor behavior. ΔROA[-1,+1] is the change in ROA around IPO. Panel B examines the A share sample. We use (i) *Stock-level Turnover*, (ii) *Abnormal Turnover*, (iii) *Residual AH Premium*, and (iv) *AH Premium using the HSI approach*, as the measures of investor behavioral biases. *Abnormal Turnover* is estimated as the ratio of turnover in year *t-1* over turnover in year *t*-2. *Residual AH Premium* is estimated as the residual from regressing the AH premium on the natural logarithm of the maximum number of shares allowed to be shorted in the A share and Hong Kong markets, and the natural logarithm of (1+Real Interest Rate) in the A share and Hong Kong markets. *Residual AH Premium* is available since 2010 as the short-selling data are available after 2009. *AH Premium using HSI Approach* is the AH Premium measure that we construct, following the Hang Seng Stock Connect China AH Premium Index ('HSAHP') approach. We employ WLS regressions where we use the lagged-one-month market capitalization as the weight. *t*-statistics calculated using the standard errors clustered by industry and year are reported in the parentheses. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels.

Panel A. Monthly Stock Returns for A share, HK and US-listed Stocks

Variable	(1)	(2)	(3)	(4)	(5)	(6)
G-Index-I	0.068**		0.055*	0.055*	0.068**	0.055*
	(2.346)		(1.645)	(1.645)	(2.354)	(1.662)
$Sentiment_1$		-0.331***	-0.314	-0.314		-0.341
		(-8.094)	(-0.953)	(-0.953)		(-0.992)
ΔROA[-1,+1]					0.058	0.045
					(1.425)	(1.325)
A share Listed	-1.447	-1.206***	-1.491	-1.491	-1.438	-1.488
	(-1.387)	(-7.093)	(-0.982)	(-0.982)	(-1.374)	(-0.952)
Year/Month/Ind FE	Yes	Yes	Yes	Yes	Yes	Yes
Country/Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
R-squared (%)	7.90	8.25	8.66	8.66	7.90	8.66
Observations	1,477,254	1,201,246	1,085,238	1,085,238	1,477,254	1,085,238

Panel B. A share* Monthly *Stock Returns

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
G-Index-A	0.102**						0.110**	0.202***
	(2.059)						(2.205)	(2.654)
Stock-level Turnover		-0.447***					-0.090	
		(-7.488)					(-0.465)	
Abnormal Turnover			-0.199***					
			(-3.524)					
AH Premium				-0.186***				
				(-2.125)				
Residual AH Premium					-0.337***			-0.196
					(-2.998)			(-0.632)
AH Premium (HSI)						-0.483***		
						(-5.193)		
Year/Month FE	Yes	Yes	Yes	No	No	No	Yes	No
Ind/Province FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared (%)	14.42	15.27	16.28	0.38	0.25	0.49	14.43	0.28
Observations	375,078	374,418	320,806	374,418	162,370	343,697	357,094	162,370

Table IA17. Comparison of Real Interest Rates in the Largest Economies

This table reports *t*-test results of real interest rates for the largest 20 economies in terms of total GDP in PPP ranked in 2018 for the period 2000-2018. For Hong Kong (SAR), China, we extract real interest rates from 2005 (prices and interest rates in Hong Kong were volatile during the 1997 Asian crisis, making real interest rates data less reliable before 2005). Real interest rate data for China, the US, India, Japan, Italy, Brazil, South Korea, Canada, Russia, Australia, Mexico, Indonesia, South Africa, Iran, Thailand, and Hong Kong (SAR) are from the World Bank, which report real rates as the lending interest rate adjusted for inflation as measured by the GDP deflator. It is calculated as (i - P) / (1 + P), where *i* is the nominal lending interest rate and *P* is the inflation rate (as measured by the GDP deflator). For countries (Germany, France, Spain, Turkey, Switzerland and Poland) whose real interest rate data are missing from the World Bank, we use government security bonds interest rate reported by the IMF, adjusted for CPI (these countries also have missing nominal interest rate data in IMF) as the measure for real interest rate. Data for Saudi Arabia are from WIND. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels.

Country	Mean	Mean China	*t*-value	*p*-value	Difference
Brazil	37.06%	1.99%	16.985	<0.001	35.07%***
Saudi Arabia	14.39%	1.99%	3.328	0.002	12.40%***
Turkey	8.89%	1.99%	3.482	0.001	6.90%***
India	5.01%	1.99%	3.666	0.001	3.02%***
Indonesia	4.75%	1.99%	2.401	0.022	2.76%**
South Africa	4.36%	1.99%	3.617	0.001	2.37%***
Australia	3.77%	1.99%	2.64	0.012	1.78%**
South Korea	3.46%	1.99%	2.182	0.036	1.47%**
Italy	3.31%	1.99%	2.269	0.029	1.32%**
Hong Kong	3.00%	1.99%	0.738	0.445	1.01%
United States	2.81%	1.99%	1.26	0.216	0.82%
Thailand	2.58%	1.99%	0.861	0.395	0.59%
Canada	2.47%	1.99%	0.649	0.521	0.48%
Japan	2.09%	1.99%	0.156	0.877	0.10%
China	**1.99%**	**1.99%**	**--**	**--**	**--**
Mexico	1.78%	1.99%	-0.291	0.773	-0.21%
Spain	1.65%	1.99%	-0.544	0.59	-0.34%
France	1.58%	1.99%	-0.639	0.527	-0.41%
Germany	1.30%	1.99%	-1.041	0.305	-0.69%
United Kingdom	0.71%	1.99%	-1.805	0.08	-1.28%
Russia	-0.57%	1.99%	-1.572	0.125	-2.56%
Iran	-2.15%	1.99%	-1.764	0.088	-4.14%
Developed Countries	2.90%	1.99%	1.407	0.168	0.91%
Emerging Countries	7.56%	1.99%	6.375	<0.001	5.57%***

Table IA18. Governance Indexes and Stock Returns of Small and Large A Share Firms

Panel A compares the mean G-Index-A for small and large A share firms by subperiods during 2000-2018. Panel B examines the effects of governance and investor behavior measures in explaining the stock return differences between small and large A share firms. The dependent variable is annual stock returns in percentage points, including cash dividend and adjusted for stock split and inflation. The independent variables of interest are the small and large firm indicator, and the interaction terms of the indicators and governance and investor behavior measures. *Small* is a dummy indicator taking one if the firm's lagged-one-year market capitalization is below the 30th percentile. *Large* is a dummy indicator taking one if the firm's lagged-one-year market capitalization is above the 70th percentile. *t*-statistics calculated using the standard errors clustered by industry and year are reported in the parentheses. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels. See variable definitions in Appendix A of the paper.

Panel A. Comparison of G-Index-A for Small and Large A share Firms

Period	Small	N	Large	N	Difference	*t*-value
2000-04	2.906	416	2.855	277	0.051	0.82
2005-07	2.187	1,524	1.909	1,204	0.278***	6.80
2008-12	2.796	4,053	2.124	2,666	0.672***	21.87
2013-18	2.773	8,611	2.317	6,226	0.456***	23.68

Panel B. Governance and Sentiment Factors and the Performance of Large and Small A share Firms

Variable	(1)	(2)	(3)	(4)	(5)	(6)
Small	13.756***	13.708***	8.231***			
	(3.952)	(3.382)	(3.432)			
G-Index-A		1.427**	1.216**		1.353**	1.342**
		(2.442)	(1.996)		(2.372)	(2.366)
Small × G-Index-A			2.008			
			(1.553)			
Large				-6.249**	-6.527**	-3.989
				(-2.245)	(-2.265)	(-1.266)
Stock-level Turnover					-1.942**	-0.981
					(-2.273)	(-0.952)
Large × Turnover						-1.858
						(-1.633)
Firm Controls	Yes	Yes	Yes	Yes	Yes	Yes
Year/Ind FEs	Yes	Yes	Yes	Yes	Yes	Yes
Firm Location FEs	Yes	Yes	Yes	Yes	Yes	Yes
R-squared (%)	52.69	51.14	52.78	52.44	53.39	53.41
Observations	36,044	36,044	36,044	36,044	34,406	34,406

Table IA19. Decompose the Underperformance in Returns of A Share Firms: 1991-2018

This table decomposes the performance gaps of three groups of A share firms: (i) newly-listed (firms conduct IPO within two years), (ii) incumbent, and (iii) ST firms, using annual stock return data for 1991-2018. In Panel A, we first allow all A share firms to enter the cross-country regressions and estimate the coefficient of the A share indicator (Row 1), then allow incumbent firms and incumbent plus newly listed firms to enter the regressions (Rows 2 and 3). In Panel B, we take the differences in the regression coefficients of the A share indicator (in Panel A) in order to measure the marginal contribution of each of the three groups of firms to the overall performance gap. The contribution by the ST firms (newly listed firms) is measured by the difference in coefficients in Row 1 and Row 3 (Row 2 and Row 3) of Panel A. We divide the performance gap of each group of firms by the total A share performance gap to obtain the relative contribution (in percentages) of each group. We employ WLS regressions in Panel A, where we use the lagged-one-year market capitalization as the weight. *t*-statistics calculated using the standard errors clustered by industry and by year are reported in the parentheses. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels.

Panel A. Decompose Gaps of A share Firms: Regression Coefficients during 1991-2018

	All	SOEs	Non-SOEs
	(1)	(2)	(3)
(1) All A share Firms (Incumbent	-13.399***	-12.995***	-12.993***
+ Newly Listed + ST)	(-4.732)	(-3.700)	(-3.698)
(2) Incumbent Firms Only	-9.412**	-7.99**	-8.374**
	(-2.385)	(-2.171)	(-2.289)
(3) Incumbent + Newly Listed	-11.399***	-11.038***	-11.490***
	(-3.293)	(-3.141)	(-3.292)

Panel B. Decompose Underperformance of A share Firms during 1991-2018 (in percentages)

	All Firms	All Firms (%)	SOEs	SOEs (in %)	Non-SOEs	Non-SOEs (in %)
	(1)	(2)	(3)	(4)	(5)	(6)
Firms in ST Status	2.000	14.93%	1.957	15.06%	1.503	11.57%
Incumbent Firms	9.412**	70.24%	7.99**	61.49%	8.374**	64.45%
Newly Listed Firms	1.987*	14.83%	3.048*	23.46%	3.116*	23.98%

Table IA20. Beta Estimates of A Share Listed Firms and Externally Listed Chinese Firms

This table reports the beta estimates of A share listed and externally listed Chinese firms by industry. First, we use firms' monthly stock returns from 2000 to 2018 to estimate the beta for each firm. For externally listed Chinese firms, we use the value-weighted stock returns of firms listed in its listing exchange or country as the market returns, with the lagged-one-year market capitalization as the weight. For instance, to estimate the beta of a Chinese firm listed in Hong Kong, we use the value-weighted stock returns of all the firms listed in Hong Kong as the market return. For A share listed firms, we use the value-weighted stock returns of all the firms listed in the A share market as the market return, then we take the weighted average of betas across firms by industry, using firms' market capitalization as the weight. Columns 1 to 3 report the average betas of Chinese firms listed in Hong Kong, US, and Singapore, respectively; Column 4 reports the weighted average betas of all externally listed Chinese firms (using USD denoted market cap as weight). We compare betas of externally listed Chinese firms and A share listed firms for each industry sector and report the differences in Column 6 and the *t*-statistics in Column 7. ***, ** and * denote the statistical significance at the 1%, 5% and 10% levels.

Industry	HK Listed Chinese Firms	US Listed Chinese Firms	Singapore Listed Chinese Firms	All Externally Listed Chinese Firms	A share Listed Firms	Difference (4)-(5)	*t*-statistics
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Basic Materials	N/A	1.37	1.25	1.31	1.10	0.21	1.39
Consumer Goods	0.83	1.11	1.14	0.86	0.97	-0.12*	-1.88
Consumer Services	0.96	1.45	0.48	1.35	1.02	0.34***	4.45
Financial & Real Estate	0.91	1.34	-0.32	0.91	1.00	-0.09	1.59
Healthcare	1.26	0.95	0.93	0.95	0.87	0.09	1.37
Industrials	1.14	1.79	1.35	1.19	1.06	0.13	1.17
Oil & Gas	0.89	N/A	2.73	0.89	0.91	-0.02	-0.19
Technology	1.11	N/A	1.35	1.12	1.09	0.02	0.88
Telecommunications	0.55	0.23	1.86	0.47	0.82	-0.35	-1.23
Utilities	0.91	1.64	N/A	0.92	0.92	0.00	1.08

Derivations and Proofs of Key Results of Theoretical Model

a) Derivation of V_{Lt}: As explained in Section III.1,

$$V_{Ht} = \frac{EC_{Lt}(1+g_H)}{r-g_H} \tag{1}$$

From Equation (2) of the paper, we know that

$$V_{Lt} = \frac{EC_{Lt+1}+\pi V_{LHt+1}+(1-\pi)V_{LLt+1}}{1+r} \tag{2}$$

$$= \frac{EC_{Lt}(1+g_L)+\frac{\pi EC_{Lt}(1+g_L)(1+g_H)+(1-\pi)V_{LLt+1}}{r-g_H}}{1+r}$$

$$= \frac{(1+g_L)+\left(1+\frac{\pi(1+g_H)}{r-g_H}\right)EC_{Lt}+(1-\pi)V_{LLt+1}}{1+r} \tag{A1}$$

Now

$$V_{LLt+1} = \frac{(1+g_L)\left(1+\frac{\pi(1+g_H)}{r-g_H}\right)EC_{Lt+1}+(1-\pi)V_{LLLt+2}}{1+r}$$

Substituting this in (A1):

$$V_{Lt} = \frac{(1+g_L)\left(1+\frac{\pi(1+g_H)}{r-g_H}\right)EC_{Lt}}{1+r} + \frac{1-\pi}{(1+r)^2}\left[(1+g_L)^2\left(1+\frac{\pi(1+g_H)}{r-g_H}\right)EC_{Lt}+(1-\pi)V_{LLLt+2}\right]$$

$$V_{Lt} = EC_{Lt}\left(1+\frac{\pi(1+g_H)}{r-g_H}\right)\left[\frac{1+g_L}{1+r}+\frac{(1-\pi)(1+g_L)^2}{(1+r)^2}\right]+\frac{(1-\pi)^2}{(1+r)^2}V_{LLLt+2}$$

Continuing with this process:

$$V_{Lt} = a[b+(1-\pi)b^2+(1-\pi)^2b^3+\cdots] \tag{A2}$$

where

$$a = EC_{Lt}\left(1+\frac{\pi(1+g_H)}{r-g_H}\right) \tag{A3}$$

$$b = \frac{1+g_L}{1+r} \tag{A4}$$

Multiplying (A2) by (1-π)b gives

$$(1-\pi)bV_{Lt} = a[(1-\pi)b^2+(1-\pi)^2b^3+\cdots] \tag{A5}$$

Subtracting (A5) from (A2) gives

$$[1-(1-\pi)b]V_{Lt} = ab$$

$$V_{Lt} = \frac{\frac{a(1+g_L)}{1+r}}{1-\frac{(1-\pi)(1+g_L)}{1+r}} \tag{A6}$$

$$= EC_{Lt}\left(1+\frac{\pi(1+g_H)}{r-g_H}\right)\left(\frac{1+g_L}{r-g_L+\pi(1+g_L)}\right) \quad (3)$$

b) Derivation of returns in the state when there is no reform (R_L) and the state when the reform is successful (R_H): Now R_L is the ex post current period return with no announcement, and is given by

$$R_L \equiv 1 + r_L = \frac{EC_{Lt+1} + V_{LLt+1}}{V_{Lt}}$$

From (3) it can be seen $V_{LLt+1} = (1+g_L)V_{Lt}$, so

$$\begin{aligned} 1 + r_L &= 1 + g_L + \frac{EC_{Lt}(1+g_L)}{V_{Lt}} \\ &= 1 + g_L + (r-g_H)\left(\frac{r-g_L+\pi(1+g_L)}{r-g_H+\pi(1+g_H)}\right) \\ &= (1+r) - (g_H-g_L)\left(\frac{\pi(1+r)}{r-g_H+\pi(1+g_H)}\right) \end{aligned} \quad (4)$$

R_H is the ex post current period return with the announcement is made, and is given by

$$\begin{aligned} R_H \equiv 1 + r_H &= \frac{EC_{Ht+1} + V_{HHt+1}}{V_{Lt}} \\ &= \frac{(1+g_H)\left(1+\frac{1+g_H}{r-g_H}\right)}{(1+g_L)\left(1+\frac{\pi(1+g_H)}{r-g_H}\right)\left(\frac{1}{r-g_L+\pi(1+g_L)}\right)} \\ &= (1+r)\frac{(1+g_H)(r+\pi-g_L(1-\pi))}{(1+g_L)(r+\pi-g_H(1-\pi))} \end{aligned} \quad (5)$$

c) Derivation of $\frac{\partial R_L}{\partial \pi}$: Finally, for Proposition 1, partially differentiating (3), it can be shown that:

$$\frac{\partial R_L}{\partial \pi} = -(g_H - g_L)(1+r)\left(\frac{r-g_H}{(r-g_H+\pi(1+g_H))^2}\right) \quad (A7)$$

Because $r > g_H$ and $g_H > g_L$, which means that the low-state return is decreasing in π.

d) Derivation of Proposition (2): From Equations (4) and (5) we know that:

$$R_L^{OP} = (1+r) - (g_H - g_L)\left(\frac{\pi^{OP}(1+r)}{r-g_H+\pi^{OP}(1+g_H)}\right)$$

$$R_H^{OP} = (1+\mathrm{r})\frac{(1+g_H)}{(1+g_L)}\frac{\left(r+\pi^{OP}-g_L(1-\pi^{OP})\right)}{\left(r+\pi^{OP}-g_H(1-\pi^{OP})\right)}$$

Because $r > g_H$, $g_H > g_L$, it is easy to show that

$$R_L^{OP} < 1 + r < R_H^{OP}.$$