



China's secondary privatization: Perspectives from the Split-Share Structure Reform [☆]



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ABSTRACT

The Split-Share Structure Reform granted legitimate trading rights to the state-owned shares of listed state-owned enterprises (SOEs), opening up the gate to China's secondary privatization. The expectation of privatization quickly boosted SOE output, profits, and employment, but did not change their operating efficiency and corporate governance. The improvements to SOE performance are positively correlated to government agents' privatization-led incentive of increasing state-owned share value. In terms of privatization methodology, the reform adopted a market mechanism that played an effective information discovery role in aligning the interests of the government and public investors.

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1. Introduction

The split-share structure was a legacy of China's initial share issue privatization (SIP), in which state-owned

enterprises (SOEs) went public to issue minority tradable shares to institutional and individual investors. On the other hand, the Chinese government withheld control of these listed SOEs by owning majority non-tradable shares.³ Although the split-share structure played a positive role in facilitating the SIP, it jeopardized China's

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³ For almost all SOEs that went public before 2005, state-owned shares—together with shares issued to non-state legal persons, natural persons, and foreigners before initial public offerings (IPOs)—were prohibited from trading in the secondary market. Only new shares issued in IPOs and seasoned cash offerings and shares derived from tradable shares in rights offerings and stock splits were tradable. By the end of 2004, the total number of RMB-denominated domestic shares (A-shares) outstanding was 714.9 billion. There were 454.3 billion non-tradable shares, 74% of which were state-owned (China Securities Regulatory Commission, 2008).

continued privatization efforts by restricting the tradability of state-owned shares in the secondary market. It caused serious corporate governance problems, encouraged speculation in the stock market, and blocked mergers and acquisitions.⁴

In 2005, the Split-Share Structure Reform was initiated to dismantle the dual share structure by converting non-tradable shares into tradable shares.⁵ The reform effectively removed the legal and technical obstacles of transferring state-owned shares to public investors, opening up the gate to China's secondary privatization, which, in contrast to the initial SIP, would further liberalize state-owned shares in full circulation. Although it had long been predicted that the Split-Share Structure Reform would substantially change China's corporate landscape (Inoue, 2005), the privatization effect of the reform has not been studied. In contrast, China's initial SIP during the 1990s received extensive research attention (See, e.g., Bai, Li, and Wang, 1997; Lin, Cai, and Li, 1998; Lin, 2000; Sun and Tong, 2003). In this paper, we fill the research gap by reviewing and evaluating the Split-Share Structure Reform. We measure and examine the privatization effect of the reform as the differences between the changes in the fundamental performance of SOEs and comparable non-SOEs before and after the reform.⁶ We explore the sources of the privatization effect, and provide policy implications for future privatization.

The evidence shows that the output, profit, and employment of listed Chinese firms substantially increased after the reform and much more so for SOEs. Such differences were reflected in higher SOE stock returns, consistent with Megginson, Nash, and Randenborgh (1994) in that firms with better incentives to increase stock value boost output and profits. After the reform, SOEs and non-SOEs experienced similar degrees of increase in operating efficiency, measured by accounts receivable turnover and expense-to-revenue ratio. However, evidence on change in corporate governance, measured by agency activities of controlling shareholders, for SOEs and non-SOEs is mixed. It appears that the Split-Share Structure Reform had a privatization effect that quickly boosted SOE output and profits, but did not change SOE corporate governance and operating efficiency.

We look into the sources of the privatization effect. After the reform, state-owned shares became market priced and could be conveniently transferred to public investors in the

secondary market. These changes led to an expectation of in-depth privatization in the future. In preparing for privatization by increasing the market values of state-owned shares, government agents who operate and control SOEs will be rewarded with more control power and favorable promotion opportunities if they improve SOE performance.⁷ As a result, the interest of government agents became better aligned with the interest of public investors. Evidence shows that privatization-led improvements to post-reform SOE performance are positively correlated to government agents' supportive activities to SOEs. Moreover, we find that post-reform state-owned share sales, which constitute a punitive mechanism to government agents, are negatively correlated to privatization-led improvements to SOE performance.

Compared to privatization in other countries (Megginson and Neffer, 2001; Stiglitz, 2002) and failed early privatization attempts in China, the Split-Share Structure Reform adopted a market mechanism through which government agents and public investors negotiated the terms of SOE reform plans including consideration paid to the latter.⁸ The market mechanism allowed government agents to communicate with public investors their incentive of improving SOE performance after the reform in exchange for the latter's agreement to reform. We find that privatization-led improvements to post-reform SOE performance are positively correlated to public investors' reform plan approval rates, and negatively correlated to the amount of consideration. The evidence suggests that market mechanism played an effective information discovery role in facilitating privatization in the reform. It helped to align the interests of the government and public investors, and to ensure a smooth implementation of the reform.

Our finding adds new support to the notion that privatization improves the performance of SOEs (Megginson, Nash, and Randenborgh, 1994; Dewenter and Malatesta, 2001; Boubakri, Cosset, and Guedhami, 2005; Song, Storesletten, and Zilibotti, 2011). Moreover, expectation on privatization can stimulate managerial incentives and boost firm performance even before actual ownership transition takes place. The finding generates implications for privatization policy, which is considered a complex task for global economies. Outcome of privatization is influenced by not only economic, political, legal, institutional and firm-specific factors (Megginson, Nash, Netter, and Poulsen, 2004), but also privatization methodology (Perotti, 1995; Biais and Perotti, 2002).⁹ We demonstrate

⁴ Section 2.2 presents in detail the corporate governance problems and other issues caused by the split-share structure. See also Allen, Qian, and Qian (2005), Hwang, Zhang, and Zhu (2006), Deng, Gan, and He (2008), and Liao, Liu, and Wang (2011) for additional discussions.

⁵ The Split-Share Structure Reform remains an ongoing process as of November 2013. Most listed firms, however, finished the reform between 2005 and 2007. There are 1,260 firms that finished the reform by the end of 2007. As of November 2013, only three out of the 1,315 listed firms with the split-share structure did not reform.

⁶ A firm is classified in this paper as SOE if its ultimate controlling party is the state. See Section 4.1.1 for more classification details. The Split-Share Structure Reform was simultaneously carried out on SOEs and comparable non-SOEs with the split-share structure. For non-SOEs, the reform dismantled the split-share structure. For SOEs, the reform in addition liberalized state-owned shares, which led to an expectation of in-depth privatization.

⁷ We use "government agents" to denote SOE executives and controlling shareholders. Almost all Chinese listed SOEs have state-owned controlling shareholders, who hold majority non-tradable shares on behalf of the Chinese government. Executives of listed SOEs are appointed and evaluated by their controlling shareholders, whose executives are appointed and evaluated by the Chinese government.

⁸ Sections 2.3 and 2.4 present in detail China's failed privatization attempts after the SIP and the market mechanism in the Split-Share Structure Reform, respectively.

⁹ Megginson and Neffer (2001) and Sheshinski and Lopez-Calva (2003) provide excellent reviews of the empirical and theoretical privatization literature. Brada (1996) classifies privatization methods into four categories: privatization through restitution, privatization through the sale of state property (direct sales and SIP), mass or voucher privatization, and privatization from below. Different economies have adopted different privatization methods and have experienced very

that market mechanism is more effective than crude top-down privatization orders when China enters into an in-depth reform era. These positive elements of the Split-Share Structure Reform provide policy implications for China's continued economic reforms and privatization in the other economies.

To the best of our knowledge, this study constitutes the first effort to review the Split-Share Structure Reform with privatization perspectives, and evaluate its long-term effects on SOE performance and corporate governance.¹⁰ The reform also provides a desirable experiment setting enabling us to overcome such methodology difficulties as sample bias, data unreliability, and changing environments that plague the empirical privatization literature (Megginson and Neffer, 2001; Sheshinski and Lopez-Calva, 2003). As a policy event, the reform involved almost all listed Chinese firms, both SOEs and non-SOEs, in the world's largest transitional economy, providing a cross-sectional sample of unprecedented scale. Publicly disclosed high-quality financial, stock, and ownership data are available before and after the reform. These unique features allow us to measure the effects of privatization in a clean and reliable manner.

The rest of the paper is organized as follows. Section 2 reviews the Split-Share Structure Reform and its background. Section 3 develops our hypotheses. Section 4 describes our empirical strategy. Section 5 analyzes the empirical findings. Section 6 concludes.

2. Review of the Split-Share Structure Reform

This section presents the origin of the split-share structure and the problems it had caused. It then reviews China's failed in-depth privatization attempts before the

(footnote continued)

different results. For example, Boubakri and Cosset (1998) evaluate the financial and operating performance of newly privatized firms in developing countries, and find significant post-privatization improvements. Harper (2002) and Black, Kraakman, and Trassova (2000) find disappointing results from the Czech Republic and Russia—firm income, profitability, and employment significantly decreased after voucher privatization. Martin and Parker (1995) show that most UK firms did not improve their performance after privatization through asset sales after adjusting for the business cycle effect. Boubakri and Cosset (2002) find that 79 SOEs in 21 African countries improved their output, operating efficiency, and profitability after SIP.

¹⁰ There is a growing literature studying the Split-Share Structure Reform as a special event to examine various corporate finance and capital market issues. Among them, the study of Li, Wang, Cheung, and Jiang (2011) finds that consideration is significantly influenced by efficiency gain from better risk sharing. Liao, Liu, and Wang (2011) examine information discovery and information-based trading during post-reform lockups. Chen, Chen, Schipper, Xu, Xue (2012) investigate the change in firm cash holdings around the reform. Among studies on short-term market reactions and the interaction between consideration and ownership, that of Bortolotti and Beltratti (2006) reports a statistically significant 8% positive abnormal return over the reform event window after adjusting for consideration requested by tradable shareholders. Lu, Balatbat, and Czernkowski (2008) find that the positive abnormal returns after the reform announcement are not related to consideration paid to tradable shareholders. Firth, Lin, and Zou (2010) report the negative effects of state-ownership and mutual fund ownership on consideration. Liu, Uchinda, and Yang (2014) report a significant reduction in cash dividends after the reform, which is significantly related to the reduction in ownership of the largest shareholders.

Split-Share Structure Reform, followed by a description of the reform process.

2.1. Review of the Split-Share Structure Reform

A split-share structure involves two classes of domestic A-shares with otherwise identical rights, tradable and non-tradable, coexisting in a listed firm in China.¹¹ Before the Split-Share Structure Reform, the non-tradable shares were prohibited from trading in the secondary market, and only allowed to be transacted through negotiations between designated parties. The transaction was also subject to the approval of relevant regulatory authorities. In contrast, the tradable shares were issued to public investors and could be transacted in the secondary market.

The origin of this dual share ownership structure can be traced back to the enterprise ownership structure reform in 1978. By then there were only two types of enterprise ownership in China: SOEs, which contributed 78% of China's industrial output, and *collectives*, which were small enterprises operated by rural municipalities or urban communities. In the early 1980s, the Chinese government carried out a series of reforms to improve the low productivity and shrinking efficiency of financially plagued SOEs. The early economic reform attempts achieved limited success, because their goals of decentralizing decision making and improving managerial incentives were unable to fundamentally resolve the complex ownership structure problems inherited from the country's planned economy.¹²

The Chinese government started corporatizing a selection of small and medium SOEs in the mid-1980s and experimented by privatizing them as a core element of the second-stage economic reform started in 1988. The founding of the Shanghai Stock Exchange and Shenzhen Stock Exchange in 1990 marked the start of China's SIP. SOEs went public to issue exchange-listed tradable shares to institutional and individual investors. The SIP could be best labeled as partial because it transferred only a small portion of SOE ownership to public investors and did little to lessen the state's dominant role in corporate decision making.

The split-share structure was then formed during the SIP. State-owned shares, together with shares issued to legal persons, natural persons, and foreigners before IPOs, were prohibited from trading in the secondary market. This restriction was explicitly written in public offering prospectuses or publicly announced. Only new shares issued in IPOs and seasoned cash offerings and those derived from tradable shares in rights offerings and stock splits were tradable on the stock exchanges. The *Tentative Measures for the Administration of the Issuance and Trading*

¹¹ A listed Chinese firm can issue several types of common shares. A-shares are common shares priced in RMB and traded on the Shanghai or Shenzhen Stock Exchanges. B-shares are listed on the Shanghai or Shenzhen Stock Exchanges but priced in US dollars. H-shares are listed on the Hong Kong Stock Exchange and priced in Hong Kong dollars. A firm can also be cross-listed overseas. For example, N- and L-shares represent shares listed on the New York Stock Exchange and London Stock Exchange, respectively.

¹² See Sun and Tong (2003) for a detailed review of the goals and undesirable outcomes of these reform policies before SIP.

of Stocks, issued by the State Council in April 1993, required transactions of state-owned shares to be approved by the relevant authorities but provided no applicable measures on implementation.

Indeed, the Chinese government chose to put the state-owned share transaction issue on hold indefinitely for several reasons. First, transaction of state-owned shares appeared unnecessary within a centralized ownership framework and the designated administrative system.¹³ Second, in the 1990s, the economic reform was still focused on the administration and management of SOEs that went public mainly to raise capital and to experiment with new government-controlled management mechanism. Third, the Chinese stock market was at an experimental stage and not ready to facilitate transactions of state-owned shares.

2.2. Problems caused by the split-share structure

The legacy split-share structure created serious problems in the functioning and development of China's financial markets in the recent years and caused tremendous concerns. Under the split-share structure, the interests of tradable and dominant non-tradable shareholders naturally diverged due to different pricing mechanisms of tradable and non-tradable shares. The non-tradable shares were priced according to the book value of firm assets. Controlling non-tradable shareholders, who on average possessed two-thirds of total shares outstanding, were unable to benefit from capital gains. Hence, they had little, if not zero, incentive to improve firm share values.

In the absence of effective internal and external monitoring, controlling shareholders tend to let listed firms to relentlessly raise money through seasoned cash offerings.¹⁴ Controlling shareholders were not concerned over control dilution and adverse market reactions because they had absolute control but did not benefit from capital gains. After raising money, controlling shareholders exploited minority shareholders through related-party transactions, where controlling shareholders transferred wealth from listed firms to entities they owned through, e.g., asset sales and product purchases (29.7% of firms in our sample engaged in related-party transactions with controlling shareholders before the reform). Some listed firms made loans to controlling shareholders (42.3% of firms in our sample made loans to their controlling

shareholders before the reform). Some listed firms guaranteed loans for their controlling shareholders.

As a result, investors speculated in the stock market for short-term returns rather than invested for long-term capital gains. Overtrading was rampant in the Chinese stock market. As of 2007, the average turnover ratios of the Shanghai and Shenzhen Stock Exchanges were 927% and 987%, respectively. In comparison, as of 2005, the average turnover ratios of the stock markets in the US, UK, and Japan were 129%, 142%, and 119%, respectively (China Securities Regulatory Commission, 2008). Such high turnover ratios cannot be justified by liquidity, since high liquidity should be accompanied by low volatility of stock returns. Liao, Liu, and Zhang (2010) show that between 1995 and 2008, the average monthly stock return volatilities of the Shenzhen and Shanghai Stock Exchanges were 10.7% and 8.9%, respectively. The volatilities are the highest in the world, and 19 and 16 times the average stock return volatility of the New York Stock Exchange. Highly volatile stock prices in the Chinese stock markets are likely driven by speculative trading activities (Sun and Tong, 2003; Allen, Qian, and Qian, 2005; Xiong and Yu, 2011).

The lack of controlling shareholder incentive to finance with debt to avoid potential financial distress together with corporate bond pricing difficulties introduced by the split-share structure fundamentally discouraged the development of domestic corporate debt and derivative markets. As of 2007, the ratio of China's bond market capitalization to gross domestic product (GDP) was 35.3%, far lower than 188.5% and 201.0% of the US and Japan, respectively. Corporate bonds amounted to only 4.2% of China's bond market. The ratio of outstanding corporate bonds to GDP was 1.5% for China, in comparison to 125.7% and 38.9% for the US and Japan, respectively (China Securities Regulatory Commission, 2008).

2.3. Failed early privatization attempts

The Split-Share Structure Reform, as part of China's in-depth privatization efforts, did not come in an easy way. This section presents China's failed privatization attempts before the reform and the reasons of their failure.

In September 1999, the Fourth Plenum of the 15th Central Committee of the Communist Party of China passed the Decision of the Central Committee of the Communist Party of China on Major Issues Concerning the Reform and Development of State-Owned Enterprises. The decision aimed to privatize an unspecified number of state-owned shares to raise capital for the Social Security Fund, which served to lessen the welfare burden of SOEs. The privatization, however, was conditional on that the state secured absolute control of those SOEs to be further privatized.

In December 1999, the CSRC hand-picked 10 listed companies to pilot the state-owned share sales. As in rights offerings, preferential subscription rights were offered to existing shareholders. Sale prices were crudely set using firms' average earnings per share in the past three years multiplied by a fixed price earnings ratio of 10. Sales were quickly suspended after two companies practiced the decision, because the stock market negatively

¹³ Socialism by then was ideologically interpreted as that citizens collectively own assets. The state possesses assets on behalf of citizens at the primitive stage of socialism. The central government represents the state in exercising ultimate control and administration of state-owned assets. State-owned asset-holders consisted of different levels and departments of the Chinese government and their affiliates, who represented the central government to manage SOEs according to their administrative functions. Transfers of state-owned assets due to reorganization and industry restructure were almost all executed through administrative orders without monetary transactions.

¹⁴ Boards of directors nominated by dominant non-tradable shareholders did not function effectively in terms of monitoring managerial behaviors in the best interest of minority tradable shareholders. External monitoring through corporate takeovers was not feasible due to non-transferability of non-tradable shares.

reacted due to the huge discrepancies between the sale prices and market expected prices. The Shanghai Composite Index and the Shenzhen Composite Index dropped by 7.3% and 6.8%, respectively, during the 25-day sale period.

On June 12, 2001, the State Council issued the *Interim Measures of the State Council on the Management of Reducing State Shares Held and Raising Social Security Funds*, stating that SOEs would privatize 10% of state-owned shares in IPOs and seasoned cash offerings. The price of state-owned shares would be set equal to the issue price. Sales were halted on October 22, 2001 after 16 SOEs practiced the interim measures, and invited tremendous adverse market reaction. During four months, the Shanghai and Shenzhen Composite Indexes plummeted by 31.0% and 32.9%, respectively. The stock market remained bearish throughout 2002–2004 with transaction volumes shrunk by nearly 30%. The Shanghai Composite Index plunged from a record high of 2,245 points on June 14, 2001 to 998 points on June 6, 2005. During the same period of time, the Chinese economy experienced 11% growth each year.

Why did the market react so adversely? The market was concerned that the rapidly inflated stock volume could flood the secondary market. A more fundamental reason was that these privatization attempts breached the agreement between the Chinese government and public investors on non-tradability of state-owned shares, which was explicitly written in IPO and seasoned equity offering prospectuses. The privatization attempts harmed investor interest but provided no compensation, creating wide spread dissatisfaction and anxiety over the overhung state-owned shares. In November 2001, the CSRC solicited public opinions and suggestions on practical methods to privatize state-owned shares. No satisfactory resolution was reached because investors refused to accept the notion of privatizing state-owned shares without completely legitimizing their trading rights and compensating tradable shareholders.¹⁵

2.4. The Split-Share Structure Reform

The Chinese government gradually realized that in-depth privatization and market liberalization could not be accomplished without completely dismantling the legacy dual share structure inherited from the initial SIP. The Split-Share Structure Reform was initiated to liberalize state-owned shares in full circulation. On January 31, 2004, the State Council issued *Some Opinions of the State Council on Promoting the Reform, Opening and Steady Growth of Capital Markets* as a blueprint of the reform. *The Notice of the China Securities Regulatory Commission on*

Piloting the Share-Trading Reform of Listed Companies issued on April 30, 2005 marked the official start of the Split-Share Structure Reform.¹⁶ Instead of directly selling state-owned shares to public investors, the reform aimed to convert all non-tradable shares into legitimate tradable shares paying negotiated considerations to tradable shareholders. To encourage listed firms to reform, the CSRC imposed the reform as a prerequisite for seasoned equity offerings.

A firm's reform process typically has several steps. First, if the shareholders of over two-thirds of non-tradable shares agree to reform, the board of directors authorizes the management to hire a qualified securities firm as facilitator to formulate a tentative reform schedule with the domestic exchange on which the firm is listed. Non-tradable shareholders then propose a reform plan that specifies consideration paid to tradable shareholders in exchange for the trading rights of non-tradable shares. The consideration can be paid in cash, stock, stock option, or warrant.¹⁷ Controlling non-tradable shareholders could make legally binding promises on future dividend payouts and/or asset injections to sweeten the consideration package. The proposal is then circulated for tradable shareholder feedback and negotiation.¹⁸

The reform adopts a market mechanism through which tradable and non-tradable shareholders negotiate the terms of the reform plan. On the principle of fair negotiation, mutual trust, and independent decision making (China Securities Regulatory Commission, 2008), the negotiation reflects each firm's specific situation. No government intervention or standard pricing is imposed. After receiving positive feedback from tradable shareholders during negotiation, the firm calls for a special shareholder meeting in which tradable shareholders vote to approve the proposal. The firm is also required to provide the necessary information technology system for tradable shareholders to vote online. Trading of tradable shares is frozen on the meeting day. The reform plan is submitted to the CSRC for final approval if the shareholders of more than two-thirds of the tradable shares whose shareholders participate in the voting support it. After the CSRC's approval, the reform plan becomes effective. Trading of tradable shares resumes on the next trading day.

To stabilize the stock market, each firm's reform plan contains a compulsory lockup period of 12 months for non-tradable shares after the reform plan's effective day.

¹⁶ Four companies, namely, Sany Heavy Industry, Tongfang Co., Zijiang Enterprise Group, and Jinniu Energy Resources, comprised the first batch of pilot firms chosen by the CSRC. The second pilot batch included 42 companies.

¹⁷ Li, Wang, Cheung, and Jiang (2011) report that the average (median) value of consideration, measured as the number of shares transferred to tradable shareholders for each tradable share held, is 0.305 (0.310) for firms whose non-tradable shareholders paid considerations in stock only.

¹⁸ It was not uncommon for negotiations to take several rounds. For example, Tongfang Co., one of the pilot firms, disregarded the negative feedback from tradable shareholders and held a special shareholder meeting in which its reform plan proposal was rejected and returned for re-proposal. The result substantially delayed the company's reform. Later on, all companies tended to renegotiate and re-propose their plans after learning of tradable shareholder dissatisfaction.

¹⁵ Other privatization methods, including contract-based transaction of state-owned shares, state-owned share-to-debt swaps, and auction, were either considered or pilot-tested but quickly withdrawn. For example, in January 2003, the CSRC announced a plan to sell state-owned shares, together with other non-tradable shares, at discounted prices. Sale price would be determined through public auction and below the secondary market price. After sales, non-tradable shareholders would compensate tradable shareholders through share transfers or designated rights offerings. The plan was withdrawn in two days after the Shanghai Composite Index lost 6% after the announcement of the plan.

In addition, a non-tradable shareholder is prohibited from selling more than 5% (10%) of total shares outstanding within 12 (24) months after the lockup. Transactions of non-tradable shares over 1% of total shares outstanding must be publicly disclosed within two trading days. Upon completion of the Split-Share Structure Reform, the Chinese stock market would no longer be fundamentally different from international markets in terms of pricing and valuation.

3. Hypothesis development

This section develops hypotheses to examine the privatization effect embedded in the Split-Share Structure Reform, and to discover the source of the privatization effect. Theory predicts that private ownership is more efficient than government ownership because a competitive equilibrium is Pareto optimal (Megginson and Neffer, 2001). Sheshinski and Lopez-Calva (2003) argue that significant efficiency gain should be obtained for firms being transferred from government to private ownership in competitive industries. Empirical evidence shows that in many economies and industries, firm performance is improved after privatization (Megginson, Nash, and Randenborgh, 1994; LaPorta, Lopez-de-Silance, and Shleifer, 1999; Boubakri, Cosset, and Guedhami, 2005). We first develop and test the following hypothesis on the existence of a privatization effect in the Split-Share Structure Reform:

H1. After the Split-Share Structure Reform, SOEs improved performance more than non-SOEs.

The next question is on the source of the privatization effect, if it exists. Megginson, Nash, and Randenborgh (1994) show that stronger managerial incentive of increasing share value leads to increases in SOE output and profit. Chinese SOEs have very different corporate structure than western firms. Almost all listed SOEs in China have state-owned controlling shareholders, who own majority non-tradable shares on behalf of the Chinese government. Executives of listed SOEs are appointed and evaluated by their controlling shareholders, whose executives are appointed and evaluated by the Chinese government. Thus, the interest of the Chinese government and the incentive of the government agents operating SOEs play decisive roles in shaping SOE performance and corporate governance.

The split-share structure created a particular form of agency problem within listed Chinese SOEs. Jensen and Meckling (1976) state that a form of agency problem involves the interest conflict between controlling shareholders and minority shareholders in a market with high ownership concentration. Controlling shareholders have incentive to divert firm resources for private interest at the expense of minority shareholders (Grossman and Hart, 1988; Shleifer and Vishny, 1997). Since public investors held tradable shares of listed SOEs, the agency problems in SOEs were rooted in the interest conflicts between government agents and public investors, which caused serious governance problems (Allen, Qian, and

Qian, 2005; Deng, Gan, and He, 2008). Since the sales of state-owned shares are not possible, the government agents operating SOEs are evaluated according to the book values of firm assets, revenues, or short-term profits rather than share prices. Thus, government agents are likely to make decisions that increase book assets, revenues, or short-term profits but decrease stock values.

The Split-Share Structure Reform generated an expectation of in-depth privatization.¹⁹ After the reform, state-owned shares became market priced and could be easily transferred to public investors in the secondary market. Performance of government agents will be evaluated on the market values of state-owned shares, instead of the book values of SOE assets as before the reform. Hence, the interests of government agents and public investors become better aligned. In particular, government agents will be rewarded with more control power and favorable promotion opportunities if they improve SOE performance and increase state-owned share values. For instance, strong performance of an SOE could help its controlling shareholder become group-listed.²⁰ Thus, the controlling shareholder is willing to inject more assets into the listed SOE. On the other hand, the government could divest in underperforming SOEs to discipline their management. Sales of state-owned shares constitute a punitive mechanism to government agents, diluting their control and jeopardizing their future promotion. Furthermore, SOEs with good performance could have better access to seasoned equity offerings, which are subject to profitability requirements. They could also enjoy lower financing costs, because higher firm value signals lower insolvency risk and better quality collateral. Assuming that the privatization-led incentive of government agents should be duly reflected in their supportive activities to SOEs, we develop and test the following hypothesis:

H2. Privatization-led improvements to post-reform SOE performance are positively correlated to government agents' supportive activities.

It should be noted that according to H2, it is the enhanced incentive of incumbent management, that is, the government agents, rather than the new management brought in after actual privatization takes place as in other

¹⁹ As shown in the previous section, the Chinese government had attempted but failed to privatize state-owned shares of listed SOEs to raise capital for economic reforms in the past. It remains unclear when and how the Chinese government will privatize SOEs after the Split-Share Structure Reform, which has nonetheless removed the legal and technical obstacles. The reform also hinted the direction for future policies. Growing government liabilities and loss of SOE competitiveness after further financial liberalization are potential triggers for large-scale privatization. The third plenum of the 18th Central Committee of the Chinese Communist Party in November 2013 emphasized that China will allow private capital to play a more important role in developing a mixed ownership economy.

²⁰ On August 23, 2005, the CSRC, joined by the State-owned Assets Supervision and Administration Commission of the State Council, the Ministry of Finance, the People's Bank of China (the central bank), and the Ministry of Commerce, announced *The Guiding Opinions on the Split-Share Structure Reform of Listed Companies* stating that the government encourages enterprises with good performance to become group-listed through the listed SOEs under their control after the Split-Share Structure Reform.

privatization theories, that contributes to the improvements to SOE performance. Since the expectation of privatization changes the incentive, the privatization effect could take shape before actual transfer of state to private ownership.

We further examine the information discovery role of the market mechanism adopted in the reform in facilitating privatization, arguing that the market mechanism helps to bridge the information exchange between government agents and public investors at the reform negotiation stage. The notion is that government agents could offer either higher up-front consideration or convincing outlook of higher post-reform capital gain conditional on the success of the reform in exchange for the latter's agreement to reform. If the market mechanism is effective in facilitating the information exchange, investors should be able to form reasonable expectations on the post-reform performance of SOEs, which in turn affects their approval of reform plans and the amount of consideration demanded. Therefore, we develop and test the following hypothesis:

H3. Privatization-led improvements to post-reform SOE performance are positively correlated to public investors' reform plan approval rate and negatively correlated to consideration value.

4. Empirical strategy

This section presents our empirical strategy. It first illustrates the methods used to identify the privatization effect, followed by introducing our data. It then introduces how to relate the privatization effect to its potential source.

4.1. Identifying the privatization effect

Our greatest advantage in studying privatization resides on the fact that the Split-Share Structure Reform was simultaneously carried out on listed SOEs and comparable listed non-SOEs. For non-SOEs, the reform dismantled the split-share structure. For SOEs, the reform not only dismantled the split-share structure, but also removed legal barriers of in-depth privatization. Thus, the reform has an additional privatization effect on SOEs than non-SOEs.

4.1.1. Measuring state-ownership

For robustness, we measure state-ownership in three ways: (1) we classify a firm as SOE if its ultimate controlling party is the state, non-SOE otherwise. Listed Chinese firms disclose their ultimate controlling parties in annual financial reports. The state is the ultimate controlling party of a firm if (i) the state controls directly or indirectly over 50% of total shares outstanding, (ii) the state controls directly or indirectly over 30% of total voting rights, (iii) the voting rights of the state allow it to elect over 50% of board directors, or (iv) the state has significant influence on decisions made in shareholder meetings; (2) we use the ratio of number of state-owned shares to number of total shares outstanding as a proxy for state-

ownership in our regression analysis; and (3) we assign firms by their state-ownership measured in (2) into four groups, where Group *P* contains private listed firms that do not have any state-owned shares. Group *P* constitutes a subsample of non-SOEs classified in (1).²¹ The rest of the firms are ranked by their state-owned shares to total shares outstanding ratios from low to high, and assigned to Groups S^L , S^M , and S^H evenly.

4.1.2. Evaluating the reform and estimating the privatization effect

In evaluating the Split-Share Structure Reform and estimating the privatization effect, we contrast firm performance and corporate governance three years before and after the reform. Medians, instead of means, of a list of performance and corporate governance variables are examined, because, as in Sun and Tong (2003), we note that the distributions of the key variables of interest are heavily skewed and leptokurtic.²² As a result, we apply Wilcoxon signed-rank tests to examine the significance of the median changes in the variables before and after the reform, and Wilcoxon Z-tests to examine the significance of the differences in the median changes between groups.

We adopt a *differences-in-differences* approach to measure the privatization effect. In doing so, we first divide non-SOEs into 5×5 benchmark portfolios by size (measured by market capitalization) and industry. For robustness, we construct another set of 5×5 non-SOE benchmark portfolios by size and market-to-book ratio. We then assign each SOE to one of the 5×5 benchmark portfolios by matching size and industry (size and market-to-book ratio). We compute the median changes in the performance and corporate governance variables of these benchmark portfolios, $\Delta Perform^{BK}$, and the median changes in the variables of each SOE, $\Delta Perform^{SOE}$, respectively. We measure the privatization-led improvements to SOE performance as $IMP^{PRW} = \Delta Perform^{SOE} - \Delta Perform^{BK}$. Our approach allows removing the non-privatization effects of the reform and influence of unknown factors, such as economic shocks.

4.1.3. Fundamental performance

In measuring firm fundamental performance, we consider that China revised the Chinese Generally Accepted Accounting Principles (GAAP) to embrace the International Financial Reporting Standards during our sample period. The new Chinese GAAP became effective in January 2007 with revisions concentrating on how investment profit and other income are scoped and recorded. Assets and

²¹ We manually trace the origins of the 146 private listed firms, and find that nearly 43% of the firms have never been state-owned. Their shares held by non-state legal persons, natural persons, and foreigners before IPOs were prohibited from trading in the secondary market before the Split-Share Structure Reform. About 53% of the firms had state-owned shares at IPOs. The state-owned shares were transferred to public investors on an individual case base as China continued experimenting with privatization methodology after the SIP. These privatized shares remained untradable before the Split-Share Structure Reform.

²² For example, the Shapiro-Wilk test on operating revenue generates $W=0.13$ with $p < 0.0001$, rejecting the null hypothesis that the variable is normally distributed.

shareholder equity are affected by the changes in recording inventories and retained earnings (Ding and Su, 2008; Peng and Bewley, 2010). The revision leads to incomparable earning- and asset-based financial variables, such as return on assets (ROA) and return on equity (ROE), before and after the reform.

As a result, we use the Consumer Price Index-adjusted operating revenue and operating profit as proxies for firm output. We use the number of employees to measure employment. Capital expenditure (measured as change in gross property, plant, and equipment plus change in intangible assets) normalized by operating revenue is used as a proxy for investment. We use operating revenue per employee and operating profit per employee as proxies for productivity and profitability, respectively. We compute the accounts receivable turnover and the ratio of selling and financial expenses to operating revenue to measure operating efficiency.²³ Since the commonly used debt-to-asset and current ratios are incomparable before and after the revision of the Chinese GAAP, we use the ratio of cash to total liabilities as a proxy of insolvency risk. Several commonly used but incomparable variables, such as ROA, ROE, and debt-to-asset ratio, are also reported only for reference nonetheless.

4.1.4. Stock performance

In measuring firm market performance, we estimate the Fama and French (1993) three-factor model-implied stock returns with

$$\hat{r}_i = \beta_i^M(r^M - r^f) + \beta_i^{SMB}r^{SMB} + \beta_i^{HML}r^{HML} + r^f \quad (1)$$

where r^M , r^f , r^{SMB} , and r^{HML} denote the market return (Shanghai Composite Index return), the risk-free rate (one-year Chinese Treasury rate), and the returns for the *SMB* and *HML* portfolios, respectively. The β coefficients are estimated using one-year pre-reform daily stock returns. We compute adjusted stock returns as $r_{adj} = r_i - \hat{r}_i$, where r_i denotes raw stock return. Privatization-led SOE stock return is computed as $r_{adj}^{PRIV} = r_{adj}^{SOE} - r_{adj}^{BK}$, where r_{adj}^{PRIV} denotes an SOE's adjusted stock return, and r_{adj}^{BK} denotes the median adjusted stock return of the non-SOE benchmark portfolio, to which the SOE is assigned.

4.1.5. Corporate governance

Traditional corporate governance tools, such as internal monitoring and external takeover, have been shown ineffective for listed firms in China (Allen, Qian, and Qian, 2005; Sun and Tong, 2003). We originate three measures of corporate governance: (1) related-party transactions, (2) related-party transactions with controlling shareholders, and (3) listed firms lending to controlling shareholders. These activities represented notorious controlling shareholder agency problems before the reform (Xu, Cai, and Xu, 2005; Cheung, Rau, and Stouraitis, 2006). Related-party transactions, especially those involving controlling

shareholders, were accused of being a commonly used profit tunneling strategy before the reform. Controlling shareholder borrowing at extremely low cost or even interest-free from listed firms has also been widely criticized. We examine whether the percentage of firms engaged and the amount of money involved in these agency activities change before and after the reform, in assessing the effect of the reform on listed firms' corporate governance.

4.2. Data

Data on the Split-Share Structure Reform and firm financial information are obtained from the CSMAR database and cross-checked against data in the WIND database to improve reliability. Firm operating revenues and operating profits before the revision of the Chinese GAAP are manually collected from annual financial reports, since they are not reported in the databases. There are 1,260 firms that finished the Split-Share Structure Reform by the end of 2007. We exclude 228 firms that are delisted, in the financial industry, or with incomplete accounting information. Our final sample contains 1,032 firms, among which 633 firms are SOEs and 399 firms are non-SOEs. Groups P , S^L , S^M , and S^H contain 146, 295, 296, and 295 firms, respectively.

Table 1 reports the medians of a selection of key variables one year before the reform. The medians of the ratios of non-tradable shares to total shares outstanding for non-SOEs and SOEs are similar, at 60.15% and 62.51%, respectively. SOEs, originating from capital-intensive heavy industries, are larger than non-SOEs in terms of assets, revenue, and employment. For example, the medians of non-SOE assets and annual revenue are RMB 1,264.25 million and 592.31 million, respectively. In contrast, the medians of SOE assets and annual revenue are RMB 2,069.67 million and 1,236.01 million, respectively.²⁴ SOEs and non-SOEs have similar levels of profitability. The medians of SOE (non-SOE) net margin rate, ROA, and ROE are 3.50% (3.66%), 2.50% (2.08%), and 5.26% (4.25%), respectively. SOEs and non-SOEs have comparable capital structure and short-term solvency measure. For example, the medians of SOE (non-SOE) debt-to-asset ratios and current ratios are 0.51 (0.55) and 1.17(1.14), respectively. The market-to-book ratios for SOEs and non-SOEs are 1.70 and 1.76, comparable to the average market-to-book ratio of US firms.²⁵

Managerial ownership in general is low for listed Chinese firms. The median managerial shareholding is 0.004% for the full sample, that is, average firm management holds four out of 100,000 shares outstanding. Non-

²³ General and administrative expenses are affected by the revision of the Chinese GAAP due to changes in how inventories and assets are recorded (Ding and Su, 2008; Peng and Bewley, 2010). We use selling and financial expenses, which are not affected by the revision, as a substitute for the commonly used selling, general, and administrative expenses.

²⁴ The Chinese renminbi appreciated steadily against the US dollar during our sample period. The annual average exchange rates of the US dollar to the renminbi during 2004–2009 were 8.28, 8.29, 7.97, 7.60, 6.95, and 6.83, respectively. On average, US\$1 was equivalent to RMB 7.64 during our sample period.

²⁵ Pontiff and Schall (1998) report an average book-to-market ratio of 0.668 for US firms during 1926–1994, which translates into an average market-to-book ratio of 1.50. Chen, Wang, and Zhou (2013) report an average market-to-book ratio of 2.13 for US firms during 1950–2010.

Table 1

Summary statistics.

This table reports the summary statistics of the 1,032 sample firms that completed the Split-share Structure Reform during 2005–2007. Medians of variables are reported. A firm is labeled as SOE (non-SOE) if its ultimate controlling party is (not) the state. Groups P , S^L , S^M , and S^H represent the subsamples of firms with zero, low, medium, and high levels of state-ownership measured by the ratio of number of state-owned shares to total shares outstanding. Net margin rate is calculated as net income divided by revenue. Accounts receivable turnover, asset turnover, and inventory turnover are calculated using operating revenue divided by average accounts receivable, total assets, and inventory, respectively. Capital expenditure is calculated as change in gross properties, plant, and equipment plus change in intangible assets. EBIT represents earnings before interest and tax. On average, US\$1 exchanged into RMB7.64 during the sample period.

Variable	Full sample	By ultimate control		By state-ownership				
		Non-SOEs	SOEs	P	S^L	S^M	S^H	
Sample	Number of firms	1032	399	633	146	295	296	295
	Non-tradable share-to-total share ratio	61.85%	60.15%	62.51%	60.00%	58.61%	55.99%	67.00%
Size	Total assets (RMB in millions)	1,727.19	1,264.25	2,069.67	1,350.81	1,398.51	2,016.95	2,033.64
	Revenue (RMB in millions)	946.41	592.31	1,236.01	562.83	693.95	1,145.39	1,225.31
	Number of employees	1,688.50	1,277.50	2,086.00	1,216.50	1,416.00	1,911.00	2,156.00
	EBIT (RMB in millions)	63.74	46.73	83.75	49.17	47.35	68.09	99.42
Profitability	Net margin rate (%)	3.66	3.66	3.50	3.74	3.24	3.22	4.72
	ROA (%)	2.26	2.08	2.50	1.80	1.82	2.22	3.18
	ROE (%)	4.95	4.25	5.26	4.55	3.39	4.97	6.28
Capital structure	Debt-to-asset ratio	0.52	0.55	0.51	0.54	0.54	0.53	0.49
	Current ratio	1.16	1.14	1.17	1.15	1.11	1.17	1.19
Growth	Market-to-book ratio	1.72	1.76	1.70	1.68	1.79	1.64	1.79
	Capital expenditure (RMB in millions)	61.26	35.07	87.56	42.19	41.88	70.25	96.88
Productive efficiency	Accounts receivable turnover	5.11	3.53	5.97	3.29	4.06	5.46	6.69
	Asset turnover	0.56	0.48	0.59	0.45	0.51	0.56	0.61
	Inventory turnover	3.90	3.26	4.32	3.13	3.77	3.90	4.78
Management incentive	Management shareholding (%)	0.04	0.05	0.04	0.09	0.07	0.07	0.01

SOE managers hold a higher percentage of shares than SOE managers. The median managerial shareholding for SOEs and non-SOEs are 0.004% and 0.005%. The Chinese government restricts SOE managerial shareholding to avoid value and control dilution of state assets. We, therefore, do not use managerial shareholding as a primary managerial incentive measure.

4.3. Regression setup

We test **H1** using the following regression with the full sample:

$$\Delta Perform_i = \alpha_i + \beta^{StateOwn} StateOwn_i + \sum_{j=1}^N \beta_j^{Control} Control_{ij} + \varepsilon_i \quad (2)$$

where $\Delta Perform_i$ denotes the change in fundamental performance or the stock return of firm i . $StateOwn_i$ denotes state-ownership measured by the ratio of number of state-owned shares to number of total shares outstanding. According to **H1**, the coefficient of $StateOwn_i$ is expected to be positive.

We include the ratio of number of non-tradable shares to number of tradable shares to control for the relative bargaining power of non-tradable shareholders in reform plan negotiation. Intuitively, non-tradable shareholders should have stronger bargaining power against tradable shareholders when the ratio is higher. One may be concerned that stronger improvements to SOE performance could be driven by their monopoly power (Megginson and Neffer, 2001). To address the issue, we include the logarithm

of market equity value and a regulated industry dummy to control for the monopoly power effect, because large firms in regulated industries, such as telecommunications and natural resources, tend to have stronger monopolistic power (Sun and Tong, 2003). We include a Hong Kong cross-listing dummy in the regressions to control for the cross-listing effect. We control for the year effect by including dummies for the years 2005 and 2006, respectively.

We investigate whether improvements to post-reform SOE performance are positively correlated to controlling shareholders' supportive activities with the SOE sample and the following regression:

$$IMP_i^{PRIV} = \alpha_i + \beta^{GroupList} GroupList_i + \beta^{AssetInject} AssetInject_i + \beta^{FundRaise} FundRaise_i + \sum_{j=1}^N \beta_j^{Control} Control_{ij} + \varepsilon_i \quad (3)$$

where IMP_i^{PRIV} represents privatization-led improvements to SOE post-reform performance, measured by operating revenue, operating profit, and stock return, respectively. $GroupList_i$ represents the group-listing dummy equal to one if the controlling shareholder of an SOE became group-listed after the reform, that is, majority assets of the controlling shareholders were injected into the SOE, and zero otherwise. $AssetInject_i$ represents the asset injection dummy equal to one if the controlling shareholder of an SOE injected assets into the SOE after the reform, and zero otherwise. $FundRaise_i$ represents the number of rounds of external fundraising after the reform. According to **H2**, $GroupList_i$, $AssetInject_i$, and $FundRaise_i$ should all be positively correlated to IMP_i^{PRIV} . To avoid the multicollinearity

problem, we include these supportive activities each individually as independent variables in the regressions.

To analyze whether the market mechanism played an effective informational role in facilitating privatization, we carry out cross-sectional regressions based on the following equation with the SOE sample to test H3:

$$IMP_i^{PRIV} = \alpha_i + \beta^{Consider} Consider_i + \beta^{Approval} Approval_i + \sum_{j=1}^N \beta_j^{Control} Control_{i,j} + \varepsilon_i \quad (4)$$

where $Consider_i$ and $Approval_i$ denote consideration paid to tradable shareholders and tradable shareholder reform plan approval rate, respectively. $Consider_i$ is measured as the ratio of number of shares transferred from non-tradable shareholders to tradable shareholders to number of tradable shares outstanding (Li, Wang, Cheung, and Jiang, 2011). Tradable shareholders' reform plan approval rate is computed as the ratio of number of tradable shares voted to approve the reform plan to number of tradable shares participated in the vote. According to H3, $Consider_i$ and $Approval_i$ should be negatively and positively correlated to IMP_i^{PRIV} , respectively.

The residuals in the above equations are not normally distributed.²⁶ In this situation, ordinary least square (OLS) regressions can lead to biased estimates and statistical inferences. Thus, we apply quantile regressions in our investigation (Koenker and Bassett, 1978). Quantile regression imposes no restrictive prior on the distribution of residuals, and utilizes the least absolute distance estimation algorithm instead of the least-squares algorithm. It allows one to examine any arbitrary quantiles of selected dependent variables, which enables the investigation on the significance and stability of results all over quantile spectrum. We analyze the most representative 25%, 50% (median), and 75% quantiles, and illustrate the robustness of results over the entire quantile range.

5. Result analysis

This section evaluates the Split-Share Structure Reform and its privatization effect looking into the post-reform changes in SOE and non-SOE output, employment, productivity, operating efficiency, and corporate governance. We find that the listed firms substantially increased output, profit, and employment after the reform, with SOEs significantly outperforming their counterparts. Such differences are duly reflected in their higher stock returns. These differences could be sourced to the expectation of privatization and enhanced managerial incentives. There is no consistent evidence that the expectation of privatization led to greater improvements in operating efficiency and corporate governance for SOEs than non-SOEs. Improvements to SOE performance are positively correlated to government agents' incentive of increasing state-owned

share value. The market mechanism played a remarkable information discovery role in facilitating privatization.

5.1. Evaluating the reform and privatization effect

5.1.1. Output and productivity

Table 2 reports the post-reform changes in firm output, employment, and investment. It shows that firm operating revenue increases significantly after the reform. For the full sample, the median increase is 73%, significant at the 1% level. The result is unlikely driven by outliers as column 1 shows that 779 firms experienced a positive operating revenue change, whereas 253 firms experienced a downward change. The increases in median operating revenue for non-SOEs and SOEs are 57% and 84%. Moreover, the increases in the medians for groups P , S^L , S^M , and S^H were 47%, 60%, 74%, and 92%, respectively, significant at the 1% level. SOEs experienced greater output growth than non-SOEs, that is, the difference in median output growth between SOEs and non-SOEs (the highest state-ownership group S^H and the pure private group P) was 27% (44%), significant at the 1% level. Expectation of privatization can have two opposite effects on output. On the one hand, there is a positive effect due to better-aligned government agent incentive and more flexible financing (Megginson, Nash, and Randenborgh, 1994). On the other hand, output could decrease due to a reduction in government subsidy (Boycko, Sheleifer, and Vishny, 1996). The first effect appears to dominate the second in our case.

The evidence indicates significant post-reform increases in firm operating profit. The median increases for the full sample, non-SOEs, and SOEs are 45%, 44%, and 50%, respectively, significant at the 1% level. The difference between SOEs and non-SOEs is, however, insignificant. Employment increased substantially after the reform with a median change for the full sample of 13%, significant at the 1% level. The difference in the changes of the median employment growth rate between SOEs and non-SOEs (Group S^H and Group P) is 17% (16%), significant at the 1% level. Higher growth in SOE employment after the reform cannot be entirely due to new positions created. Some employees could have been transferred from the SOE's controlling shareholders with asset injections. The reform nonetheless did not cause mass reduction in employment, which is in stark contrast to China's SIP that led to sizable unemployment in the 1990s (Sun and Tong, 2003).

Post-reform growth in capital asset investment was slower than operating revenue growth. The changes in the median ratios of capital expenditure to operating revenue for the full sample, non-SOEs, and SOEs are -2.76% , -3.87% , and -2.04% , respectively. SOEs experienced lower decreases in capital expenditure relative to their operating revenues than non-SOEs. The difference in the changes of the median ratios of capital expenditure to operating revenue between SOEs and non-SOEs (Group S^H and Group P) is 1.83% (5.16%), significant at the 10% (1%) level. The result is consistent with H2 in that government agents had a stronger incentive to inject high-quality assets into SOEs in boosting their performance and increasing stock prices after the reform.

²⁶ For example, the skewness and kurtosis of the residuals in the operating revenue regression specified in Eq. (2) are 3.3 and 15.8, respectively. The Shapiro-Wilk test on the residuals reports $W=0.70$ with $p < 0.0001$, rejecting the null hypothesis that the residuals are normally distributed.

Table 2

Post-reform changes in output, employment, and productivity.

This table reports changes in firm output, profitability, employment, and productivity three years before and after the reform. The sample consists of 1,032 firms that completed the Split-share Structure Reform during 2005–2007. Wilcoxon signed-rank test is applied to examine the significance of changes in medians of variables. Wilcoxon Z-test is applied to examine the significance of difference in changes between groups. Proportion Z-test is used to test whether increase (decrease) odds are greater than one. The *p*-values are reported in parentheses. The definitions of SOE and non-SOE (Groups *P*, *S^L*, *S^M*, and *S^H*) are the same as in Table 1. A variable with * is associated with percentage change calculated as the difference between its post-reform and pre-reform values normalized by pre-reform value. Otherwise, the change is calculated as the level difference between post-reform and pre-reform values. Variables in *italic* are incomparable before and after the revision of the Chinese Generally Accepted Accounting Principles effective in 2007, and reported only for reference. Superscripts *, **, and *** denote the significance levels of 10%, 5%, and 1%, respectively.

	Full sample		By ultimate control			By state-ownership				
	Increase odds	Median change	Non-SOEs	SOEs	SOEs – non-SOEs	<i>P</i>	<i>S^L</i>	<i>S^M</i>	<i>S^H</i>	<i>S^H – P</i>
<i>Panel A: Output, employment, and capital expenditure</i>										
Operating revenue*	779/253*** (0.000)	0.73*** (0.000)	0.57*** (0.000)	0.84*** (0.000)	0.27*** (0.000)	0.47*** (0.000)	0.60*** (0.000)	0.74*** (0.000)	0.92*** (0.000)	0.44*** (0.000)
Operating profit**	681/334*** (0.000)	0.45*** (0.000)	0.44*** (0.000)	0.50*** (0.000)	0.05 (0.176)	0.45*** (0.000)	0.34*** (0.000)	0.60*** (0.000)	0.51*** (0.000)	0.05 (0.216)
Total assets**	850/182*** (0.000)	0.81*** (0.000)	0.62*** (0.000)	0.98*** (0.000)	0.35*** (0.000)	0.64*** (0.000)	0.61*** (0.000)	0.93*** (0.000)	1.13*** (0.000)	0.50*** (0.000)
No. of employees**	606/424*** (0.000)	0.13*** (0.000)	0.02*** (0.001)	0.19*** (0.000)	0.17*** (0.000)	0.00** (0.018)	0.09*** (0.000)	0.17*** (0.000)	0.16*** (0.000)	0.16*** (0.010)
Capital expenditure (%)	317/556*** (0.000)	–2.76*** (0.000)	–3.87*** (0.000)	–2.04*** (0.000)	1.83* (0.063)	–6.28*** (0.000)	–2.76*** (0.000)	–3.58*** (0.000)	–1.12* (0.000)	5.16*** (0.002)
<i>Panel B: Productivity</i>										
Operating revenue per employee**	703/327*** (0.000)	0.41*** (0.000)	0.41*** (0.000)	0.41*** (0.000)	0.01 (0.968)	0.38*** (0.000)	0.33*** (0.000)	0.39*** (0.000)	0.53*** (0.000)	0.14 (0.283)
Operating profit per employee**	579/434*** (0.000)	0.17*** (0.000)	0.19*** (0.000)	0.15*** (0.000)	–0.04 (0.131)	0.20*** (0.000)	0.14*** (0.000)	0.16*** (0.000)	0.18*** (0.000)	–0.02 (0.331)
ROE(%)	538/465** (2.3)	0.67*** (25465)	0.72** (4539)	0.66** (8493)	–0.06 (0.7)	0.48 (0.450)	1.66*** (0.004)	0.67 (0.163)	0.10 (0.679)	–0.37 (0.644)
ROA (%)	507/523 (0.309)	–0.06 (0.863)	0.27* (0.060)	–0.17 (0.177)	–0.44** (0.023)	0.26 (0.398)	0.32** (0.029)	–0.07 (0.497)	–0.59* (0.073)	–0.85* (0.087)

Theory and empirical evidence show that a dual share structure misaligns the control and cashflow rights of controlling shareholders, and negatively affects productivity and profitability (Jensen and Meckling, 1976; Gompers, Ishii, and Metrick, 2008; Masulis, Wang, and Xie, 2009). Panel B of Table 2 reports the changes in operating revenue per employee and profit per employee as proxies for productivity. Operating revenue (profit) per employee increased significantly, by 41% (17%), 41% (19%), and 41% (15%) for the full sample, non-SOEs, and SOEs, respectively. However, there is no significant difference between SOEs and non-SOEs.

5.1.2. Operating efficiency and insolvency risk

Table 3 reports the post-reform changes in firm operating efficiency and insolvency risk. For operating efficiency, the increases in the median accounts receivable turnover for all firms, non-SOEs, and SOEs are 4.51, 4.24, and 4.64 times, respectively, significant at the 1% level. The increases in the median accounts receivable turnover for groups *P*, *S^L*, *S^M*, and *S^H* are 3.78, 5.26, 4.46, and 4.60 times, respectively, significant at the 1% level. Firms on the one hand experienced efficiency gains, and on the other hand became more discreet with credit sales, particularly during the global financial crisis in 2008–2009.²⁷ The difference

between SOEs and non-SOEs is, however, insignificant. The ratio of selling and financial expenses to operating revenue exhibits similar patterns for SOEs and non-SOEs with an increase of 3%. We find mixed evidence on improvements in operating efficiency with no significant difference between SOEs and non-SOEs. Panel B of Table 3 reports changes in leverage and solvency proxies after the reform. The ratio of cash to total liabilities displays no significant change in listed firms' insolvency risk.

5.1.3. Corporate governance

Panel A of Table 4 reports the percentage of firms engaging in the three controlling shareholder agency activities discussed in Section 4.1.5. Before the reform, there were 43.4%, 29.7%, and 42.3% of firms in our sample engaged in related-party transactions, related-party transactions with controlling shareholders, and lending to controlling shareholders. After the reform, the percentages dropped to 35.7%, 24.0%, and 16.6%, respectively. The percentage of firms engaged in these agency activities monotonically increases with state-ownership. After the reform, the percentage of *S^H* firms engaged in related-party transactions decreased more than the private listed

(footnote continued)

operating revenue is 73%, while the median decrease in accounts receivable is 13%. These results imply a median post-reform accounts receivable turnover of 8.70, leading to a net change of 4.30, which roughly matches the actual change of 4.51.

²⁷ The full-sample median accounts receivable turnover three years before the reform is 4.40. The full-sample median post-reform increase in

Table 3

Post-reform changes in operating efficiency and insolvency risk.

This table reports changes in firm operating efficiency and insolvency risk three years before and after the reform. The sample consists of 1,032 firms that completed the Split-share Structure Reform during 2005–2007. Wilcoxon signed-rank test is applied to examine the significance of changes in medians of variables. Wilcoxon Z-test is applied to examine the significance of difference in changes between groups. Proportion Z-test is used to test whether increase (decrease) odds are greater than one. The *p*-values are reported in parentheses. The definitions of SOE and non-SOE (Groups *P*, *S^L*, *S^M*, and *S^H*) are the same as in Table 1. The change is calculated as the level difference between post-reform and pre-reform values. Variables in *italic* are incomparable before and after the revision of the Chinese Generally Accepted Accounting Principles effective in 2007, and reported only for reference. Superscripts *, **, and *** denote the significance levels of 10%, 5%, and 1%, respectively.

	Full sample		By ultimate control			By state-ownership				
	Increase odds	Median change	Non-SOEs	SOEs	SOEs – non-SOEs	<i>P</i>	<i>S^L</i>	<i>S^M</i>	<i>S^H</i>	<i>S^H – P</i>
<i>Panel A: Operating efficiency</i>										
Accounts receivable turnover	806/209*** (0.000)	4.51*** (0.000)	4.24*** (0.000)	4.64*** (0.000)	0.39 (0.464)	3.78*** (0.000)	5.26*** (0.000)	4.46*** (0.000)	4.60*** (0.000)	0.82 (0.981)
Expense-to-sales ratio	714/280*** (0.000)	0.03*** (0.000)	0.03*** (0.000)	0.03*** (0.000)	0.00 (0.715)	0.03*** (0.000)	0.03*** (0.000)	0.03*** (0.000)	0.02*** (0.000)	0.00 (0.509)
Asset turnover	624/404*** (0.000)	0.08*** (0.000)	0.07*** (0.000)	0.09*** (0.000)	0.01 (0.302)	0.04 (0.114)	0.08*** (0.000)	0.10*** (0.000)	0.08*** (0.000)	0.05 (0.123)
<i>Panel B: Insolvency risk</i>										
Cash-to-total liabilities ratio	547/485** (0.027)	0.01 (0.857)	0.01 (0.614)	0.02 (0.866)	0.01 (0.530)	–0.01 (0.625)	0.06*** (0.005)	0.03 (0.510)	–0.04*** (0.007)	–0.03 (0.242)
Debt-to-asset ratio	696/336*** (0.000)	0.07*** (0.000)	0.05*** (0.000)	0.08*** (0.000)	0.03*** (0.000)	0.06*** (0.000)	0.03*** (0.000)	0.07*** (0.000)	0.11*** (0.000)	0.05*** (0.010)
Current ratio	388/644*** (0.000)	–0.15*** (0.000)	–0.07*** (0.019)	–0.18*** (0.000)	–0.11*** (0.004)	–0.10* (0.076)	–0.08*** (0.006)	–0.13*** (0.000)	–0.25*** (0.000)	–0.14* (0.082)

Table 4

Post-reform change in corporate governance.

This table reports changes in corporate governance measures before and after the reform. The sample consists of 1,032 firms that completed the Split-share Structure Reform during 2005–2007. Panel A reports the percentage of firms engaged in agency activities. Panel B reports the median ratios of the amount of money involved in agency activities to operating revenue for firms engaged in these activities. Wilcoxon Z-test is applied to examine the significance of the difference between groups in Panel B. The *p*-values are reported in parentheses. The definitions of groups *P*, *S^L*, *S^M*, and *S^H* are the same as in Table 1. Superscripts *, **, and *** denote the significance levels of 10%, 5%, and 1%, respectively.

	Pre-reform						Post-reform					
	Full sample	<i>P</i>	<i>S^L</i>	<i>S^M</i>	<i>S^H</i>	<i>S^H – P</i>	Full sample	<i>P</i>	<i>S^L</i>	<i>S^M</i>	<i>S^H</i>	<i>S^H – P</i>
<i>Panel A: Percentage of firms engaged in the agency activities</i>												
Related-party transaction	43.4%	39.7%	36.9%	45.9%	49.2%	9.4%	35.7%	29.9%	32.5%	39.0%	38.3%	8.4%
Related-party trans. with controlling shareholders	29.7%	29.5%	22.7%	31.8%	34.9%	5.5%	24.0%	19.4%	20.0%	25.4%	28.8%	9.4%
Lending to controlling shareholders	42.3%	37.7%	40.0%	43.2%	46.1%	8.4%	16.6%	9.7%	11.5%	19.3%	22.4%	10.8%
<i>Panel B: Median ratio of the amount of funds involved to operating revenue</i>												
Related-party transaction (%)	6.92	9.90	7.60	7.76	5.84	–4.06* (0.056)	7.16	8.34	7.17	5.47	7.74	–0.58 (0.660)
Related-party trans. with controlling shareholders (%)	5.81	5.59	6.34	5.66	5.84	0.25 (0.725)	7.36	10.70	5.40	6.48	9.15	–1.55 (0.412)
Lending to controlling shareholders (%)	1.11	1.01	1.43	0.64	1.15	0.14 (0.645)	0.11	0.49	0.07	0.14	0.10	–0.39 (0.436)

firms. However, the percentage of *S^H* firms engaged in related-party transactions with controlling shareholders and lending to controlling shareholders reduced less compared to firms in the private group. Panel B of Table 4 shows that the results on the changes in the relative amount of funds involved in these agency activities are also mixed. Overall, there is no consistent evidence that SOEs experienced greater improvements in corporate governance than non-SOEs, suggesting that the expectation of privatization might quickly boost SOE output and profit, but did not change corporate governance.

5.1.4. The privatization effect

Table 5 summarizes the privatization effect measured by changes in SOE operating revenue and operating profit, and Fama-French model-adjusted stock returns, respectively. An average SOE's operating revenue and operating profit increased by 84% and 50%, respectively. Its adjusted stock return is 109%. The changes are statistically significant at the 1% level. SOEs exhibit 6% (3%) higher increase in operating revenue, 2% (0%) higher increase in operating profit, and 6% (20%) higher stock return compared to their benchmark non-SOE portfolios, by size and industry (size

and market-to-book ratio), respectively. The results suggest that the Split-Share Structure Reform contains a significant positive privatization effect, supporting H1.

Table 5

The privatization effect.

This table reports the privatization effect measured by privatization-led post-reform changes in SOE operating revenue, operating profit, and stock return, respectively. The sample consists of 633 SOEs that completed the Split-share Structure Reform during 2005–2007. Unadjusted change in firm operating revenue (profit) is measured as the difference of the variable three years before and after the reform, normalized by pre-reform value. Unadjusted stock return is the three-year cumulative Fama-French model-adjusted return after the reform. In measuring the privatization effect, SOE operating revenue, operating profit, and stock return are further adjusted by the median operating revenue, operating profit, and stock return of a matching non-SOE benchmark portfolio by size–industry and size–market-to-book ratio, respectively. The *p*-values of Wilcoxon signed-rank tests on the significance of changes in the medians of variables are reported in parentheses. Superscripts *, **, and *** denote the significance levels of 10%, 5%, and 1%, respectively.

	Unadjusted	Adj. by non-SOE size– industry portfolio	Adj. by non-SOE size–M/B ratio portfolio
Operating revenue	0.84*** (0.000)	0.06*** (0.000)	0.03*** (0.000)
Operating profit	0.50*** (0.000)	0.02*** (0.000)	0.000*** (0.000)
Stock return	1.09*** (0.000)	0.06 (0.431)	0.20** (0.019)

Table 6

Post-reform changes in operational performance and state-ownership.

This table reports regression results of changes in firm operating revenue and operating profit on state-ownership for the full sample of 1,032 firms that completed the Split-share Structure Reform during 2005–2007. We follow [Koenker and Bassett \(1978\)](#) to apply quantile regressions. The results for the 25%, 50% (median), and 75% quantiles are reported. OLS regression results are reported for reference. Data are winsorized at the 1% level for OLS regressions. *t*-Statistics are reported in parentheses. Superscripts *, **, and *** denote the significance levels of 10%, 5%, and 1%, respectively.

	Operating revenue				Operating profit			
	25% quantile	50% quantile	75% quantile	OLS	25% quantile	50% quantile	75% quantile	OLS
Intercept	−94.92*** (4.9)	−73.70*** (3.1)	27.69 (0.5)	24.64 (0.5)	−45.11** (2.3)	−20.04 (0.7)	96.27 (1.3)	144.87*** (2.7)
State–ownership (%)	0.46*** (2.7)	0.51*** (2.7)	0.83** (2.3)	0.52 (1.5)	0.07 (0.4)	0.34 (1.5)	1.05** (2.4)	0.51 (1.3)
Non-tradable-to-tradable ratio	−0.08* (1.8)	−0.06 (1.1)	−0.19* (1.7)	−0.11 (1.0)	−0.07 (1.6)	−0.04 (0.6)	−0.20 (1.3)	−0.10 (0.8)
Log of market cap.	34.64*** (7.5)	43.55*** (7.7)	51.19*** (4.3)	33.92*** (3.6)	27.15*** (6.1)	30.93*** (4.8)	39.20*** (3.1)	27.50*** (2.5)
Regulated industry dummy	−1.46 (0.1)	−4.27 (0.3)	7.69 (0.2)	16.41 (0.6)	−2.61 (0.1)	−16.94 (0.7)	−30.74 (0.8)	−35.93 (1.0)
H-share dummy	35.07 (0.9)	15.68 (0.8)	−80.86 (1.5)	−14.42 (0.3)	34.98 (0.9)	13.33 (0.6)	−77.80 (0.6)	−11.61 (0.2)
B-share dummy	−27.59** (2.0)	−51.49*** (2.9)	−42.84 (0.9)	−32.67 (1.0)	−8.82 (0.7)	−33.98** (2.1)	−45.96 (1.3)	−74.95*** (2.1)
Year 2005 dummy	97.16*** (4.8)	135.37*** (5.9)	183.85*** (4.0)	150.20 (4.4)	57.13*** (3.7)	73.48*** (2.8)	99.63 (1.3)	52.87 (1.3)
Year 2006 dummy	30.57** (2.3)	34.99** (2.2)	6.79 (0.2)	11.45 (0.4)	14.20 (1.3)	16.62 (0.9)	−23.40 (0.5)	−28.90 (0.9)
Wald test for state- ownership	7.37***	7.07***	5.06**	F-stat = 5.44*** Adjusted R ² = 5.45%	0.15	2.35	5.87**	F-stat = 3.08*** Adjusted R ² = 2.68%

5.2. Sources of the privatization effect

This section analyzes the significance of the privatization effect and explores its source. The evidence shows that privatization-led improvements to post-reform SOE performance are positively correlated to the supportive activities of government agents, suggesting that their incentive plays an important role in shaping the privatization effect. Post-reform sales of state-owned shares are negatively correlated to the improvements to SOE performance, indicating that control dilution works as a punitive mechanism to government agents who fail to increase state-owned share value after the reform. Besides aligning the interests of the government and public investors, the market mechanism plays an effective information discovery role in facilitating privatization embedded in the reform.

5.2.1. The existence of the privatization effect

We formally test H1, that is, SOEs experienced significantly stronger post-reform improvement in performance than non-SOEs, using the regressions specified in Eq. (2). In Table 6, the quantile regression results indicate that post-reform increase in operating revenue is positively and significantly correlated to state-ownership. The coefficients of state-ownership are 0.46, 0.51, and 0.83 for the 25%, 50% (median), and 75% quantiles, respectively. The *t*-statistics show statistical significance at the 1%, 1%, and 5% levels, respectively. Graph A in Fig. 1 illustrates the estimates of the coefficients of state-ownership for regressions over the quantile spectrum. The post-reform change

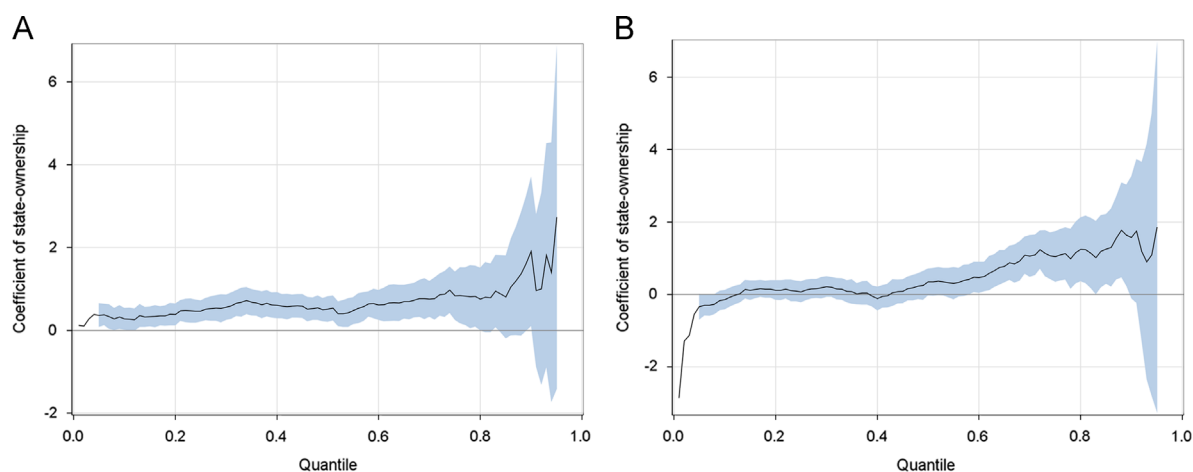


Fig. 1. Coefficients of state-ownership in quantile regressions. This figure depicts the estimates of the coefficients of state-ownership in the quantile regressions of changes in firm operating revenue and operating profit for the full sample of 1,032 firms that completed the Split-share Structure Reform during 2005–2007. The quantile regression method follows that in [Koenker and Bassett \(1978\)](#). The solid line represents coefficient values within a 0–100% quantile range. The gray area represents 95% confidence interval. Graph A: Operating revenue, Graph B: Operating profit.

Table 7

Post-reform stock return and state-ownership.

This table reports regression results of the Fama-French three-factor model adjusted stock return on state-ownership for the full sample of 1,032 firms that completed the Split-share Structure Reform during 2005–2007. We follow [Koenker and Bassett \(1978\)](#) to apply quantile regressions. The regression results for the 25%, 50% (median), and 75% quantiles are reported. OLS regression results are reported for reference. Data are winsorized at the 1% level for OLS regressions. *t*-Statistics are reported in parentheses. Superscripts *, **, and *** denote the significance levels of 10%, 5%, and 1%, respectively.

	25% quantile	50% quantile	75% quantile	OLS
Intercept	138.69*** (4.6)	231.92*** (8.0)	321.67*** (11.8)	206.14*** (7.0)
State-ownership (%)	0.70** (2.4)	0.54** (2.3)	−0.14 (0.4)	0.57** (2.1)
Non-tradable-to-tradable ratio	−0.42*** (4.2)	−0.29*** (3.6)	−0.33*** (3.6)	−0.33*** (3.9)
Change in operating revenue	0.40 (0.4)	0.20 (0.2)	0.78 (0.3)	0.64 (1.3)
Change in operating profit	0.15 (0.2)	0.21 (0.3)	0.25 (0.3)	0.20** (2.0)
Log of market cap.	−15.93** (2.4)	−28.40*** (3.8)	−28.31*** (3.2)	−35.55*** (4.6)
Regulated industry dummy	−31.75 (1.5)	−45.65** (2.0)	−43.10 (1.6)	−48.14** (2.0)
H-share dummy	−60.66 (1.4)	−69.08 (1.6)	9.01 (0.1)	−21.79 (0.5)
B-share dummy	−122.59** (4.7)	−133.74*** (7.5)	−154.95*** (6.2)	−130.49*** (5.4)
Year 2005 dummy	−43.65*** (2.6)	−49.72*** (3.9)	−2.43 (0.1)	−8.74 (0.5)
Wald test for state-ownership	5.87**	5.04**	0.12	<i>F</i> -stat = 5.21*** Adjusted <i>R</i> ² = 6.81%

in operating revenue is positively correlated to state-ownership for all quantiles.

Post-reform increase in operating profit is positively correlated to state-ownership in the 25%, 50% (median), and 75% quantiles, respectively, significant at the 5% level for the 75% quantile. Graph B in [Fig. 1](#) shows that the positive correlation between increase in operating profit and state-ownership is more pronounced for firms with high profit growth.

[Table 7](#) reports the regression results of stock performance measured by the Fama-French three-factor model-adjusted stock returns. The coefficients of state-ownership are positive and significant for the 25% and 50% (median) quantiles. Both

the fundamental performance and stock return results support [H1](#) in that improvements to SOE performance were stronger than those to non-SOE performance, highlighting a positive and significant privatization effect.

5.2.2. Government agents' incentives and the privatization effect

We test [H2](#), that is, privatization-led improvements to SOE performance are positively correlated to government agents' supportive activities, using the regressions specified in [Eq. \(3\)](#). [Table 8](#) reports the 50% quantile (median) regression results. It shows that privatization-led changes

Table 8

Post-reform changes in SOE performance and government agents' supports.

This table reports the results of the 50% quantile (median) regressions of changes in post-reform SOE operating revenue, operating profit, and stock return on government agents' supporting activities. The sample consists of 633 SOEs that completed the Split-share Structure Reform during 2005–2007. The unadjusted changes in SOE operating revenue and operating profit are calculated as the differences between the Consumer Price Index-adjusted operating revenues and profits three years before and after the reform, normalized by pre-reform values. Size–industry and size–market-to-book ratio adjusted changes are calculated using the unadjusted changes in SOE variables minus median changes in the variables of the matching non-SOE benchmark portfolios by size–industry or size–market-to-book ratio. The unadjusted SOE stock returns are the Fama-French three-factor model adjusted cumulative stock returns three years after the reform. Size–industry and size–market-to-book ratio adjusted SOE stock returns are calculated using the unadjusted SOE stock returns minus the median stock returns of the matching non-SOE benchmark portfolios by size–industry or size–market-to-book ratio. The supportive activities proxies are individually included in the regressions. *t*-Statistics are reported in parentheses. Superscripts *, **, and *** denote the significance levels of 10%, 5%, and 1%, respectively.

	Unadjusted (%)	Size–industry adjusted (%)	Size–M/B adjusted (%)
<i>Panel A: Change in operating revenue</i>			
Group listing dummy	137.23** (2.3)	168.50*** (3.7)	144.26** (2.3)
Wald test for group listing dummy	5.38**	13.32***	5.35**
Asset injection dummy	120.09*** (3.9)	113.81*** (3.8)	112.47*** (3.4)
Wald test for asset injection dummy	15.26***	14.29***	11.58***
Fund raising rounds	18.82*** (3.8)	21.61*** (4.0)	23.06*** (5.7)
Wald test for fund raising rounds	14.54***	15.76***	32.70***
<i>Panel B: Change in operating profit</i>			
Group listing dummy	116.23** (2.0)	96.06 (1.6)	109.94* (1.9)
Wald test for group listing dummy	4.16**	2.48	3.62*
Asset injection dummy	108.10*** (4.7)	104.27*** (3.3)	107.14*** (3.4)
Wald test for asset injection dummy	21.8***	10.72***	11.47***
Fund raising rounds	26.67*** (5.4)	26.02*** (5.8)	30.29*** (7.6)
Wald test for fund raising rounds	28.63***	33.67***	58.32***
<i>Panel C: Post-reform stock returns</i>			
Group listing dummy	15.07 (0.6)	22.81 (0.9)	14.78 (0.6)
Wald test for group listing dummy	0.3	0.83	0.40
Asset injection dummy	–0.54 (0.0)	2.45 (0.1)	11.70 (0.6)
Wald test for asset injection dummy	0.00	0.01	0.31
Fund raising rounds	9.01** (2.2)	6.11 (1.5)	–1.61 (0.3)
Wald test for rounds of fund raising	4.99**	2.25	0.08

in SOE operating revenue are positively correlated to the two proxies of government agents' supportive activities and the fund raising rounds proxy. The coefficients of the group listing dummy are 137.2, 168.5, and 144.3 for the unadjusted, size–industry, and size–market-to-book ratio portfolio-adjusted operating revenue regressions, significant at the 1% or 5% levels. The asset injection dummy and fund raising rounds results are consistent.

Privatization-led changes in SOE operating profit are also positively correlated to government agents' supportive activities. The asset injection dummy and fund raising rounds are significant for the privatization-led changes in SOE operating profit regressions at the 1% level. The stock return results are also consistent with the prediction of the hypothesis. But highly skewed and volatile post-reform stock returns during the global financial crisis could undermine the representativeness of the stock return results.

Overall, the empirical evidence supports H2 in that privatization-led improvements to post-reform SOE performance are positively correlated to the supportive activities of government agents and SOE financing opportunities. Since

these activities capture the incentive of government agents operating SOEs, the results support our argument that the privatization effect is positively related to the better-aligned incentive of government agents in the expectation of in-depth privatization.

5.2.3. Evidence from post-reform sales of state-owned shares

Besides rewarding the government agents who improve SOE performance, the Chinese government could choose to divest in underperforming SOEs to discipline the government agents who fail. Sales of the state-owned shares work as a punitive mechanism to government agents by diluting their control power and jeopardizing their future promotion. We examine whether post-reform sales of state-owned shares are negatively correlated to privatization-led improvements to SOE performance as a robustness check for H2. We collect data on post-reform sales of state-owned shares to public investors and measure actual privatization with (1) number of state-owned shares sold, (2) percentage of state-owned shares sold to state-owned shares owned, (3) percentage of state-owned

Table 9

Post-reform sales of state-owned shares and SOE performance.

This table reports the statistics of post-reform sales of state-owned shares as of October 2011. The sample consists of 633 SOEs that completed the Split-share Structure Reform during 2005–2007. Panel A reports the number of firms, number of state-owned shares sold, ratio of state-owned shares sold to total shares outstanding, and percentage of state-shareholders involved in the sales. We apply two-tail *t*-test to examine the statistical significance of these variables. *t*-Statistics are reported in parentheses except for column 2. Panel B reports the Pearson correlations between post-reform sales of state-owned shares and post-reform change in SOE operating revenue. Superscripts *, **, and *** denote the significance levels of 10%, 5%, and 1%, respectively.

Panel A: Post-reform sales of state-owned shares						
Industry	Obs.	Number (% in parentheses) of SOEs sold state-owned shares	Avg. number of shares sold per SOE (in millions)	Avg. % of state-owned shares sold to owned per SOE	Avg. % of state-owned shares sold to outstanding per SOE	Avg. % of state-shareholders involved in the sales
Full sample	633	160 (25.3%)	5.13*** (9.6)	2.95*** (5.8)	0.44*** (11.0)	31*** (12.7)
Utilities	69	10 (14.5%)	3.69*** (2.7)	2.66* (1.7)	0.25*** (2.5)	20*** (3.0)
Real estate	31	8 (25.8%)	4.72** (2.4)	1.24** (2.4)	0.59** (2.1)	26*** (3.2)
Comprehensive	87	25 (28.7%)	4.87*** (4.7)	2.32*** (3.2)	0.47*** (5.4)	38*** (4.9)
Manufacturing	394	108 (27.4%)	5.94*** (7.7)	3.01*** (5.0)	0.46*** (9.3)	33*** (10.6)
Commercial	52	9 (17.3%)	1.53*** (2.6)	4.91 (1.4)	0.34** (2.3)	19** (3.1)

Panel B: Correlations between sales of state-owned shares and changes in SOE operating revenue					
	Number of sales of state-owned shares	Number of state-owned shares sold (in millions)	% Of state-owned shares sold to owned	% Of state-owned shares sold to shares outstanding	% Of state-shareholders involved in the sales
Unadjusted	−0.08**	−0.08**	−0.02	−0.07*	−0.09**
Size–industry adjusted	−0.10***	−0.11***	0.00	−0.09**	−0.11***
Size–M/B ratio adjusted	−0.09**	−0.11***	0.00	−0.08*	−0.10***

shares sold to total shares outstanding, and (4) percentage of state-shareholders involved in the sales.

Panel A of Table 9 shows that state-shareholders in 160 out of 633 SOEs in our sample sold 2.95% of state-owned shares to public investors as of October 2011.²⁸ The comprehensive firms had the highest percentage of firms that sold state-owned shares, 28.7%, whereas the utility firms had the lowest 14.5%.²⁹ An average firm sold 5.13 million shares, comprising 0.44% of total shares outstanding, with 31% state-shareholders involved. The pattern is similar across all five industries. Privatization appeared to take place only on a small scale after the reform.

Panel B of Table 9 reports the correlations between post-reform sales of state-owned shares and privatization-led improvements to SOE operating performance. Number of sales of state-owned shares, number of state-owned shares sold, percentage of state-owned shares sold to total shares outstanding, and percentage of state-shareholders involved are all negatively and significantly correlated to

changes in SOE performance. The results show that the government indeed divested in underperforming SOEs after the reform, supporting our prior that improvements to post-reform SOE performance were driven by the incentive of government agents in increasing state-owned share value.

5.2.4. Information discovery role of the market mechanism

We examine whether the incentives of government agents and expectation of privatization, and information on firm quality were effectively communicated through the market mechanism adopted in the reform. Table 10 reports the 50% quantile (median) regression results in testing H3. It shows that privatization-led improvements to SOE operating revenue and operating profit are negatively and significantly correlated to consideration, and positively correlated to public investors' reform plan approval rate, supporting H3. Fig. 2 confirms the robustness of these findings.

The evidence implies that through the market mechanism, government agents communicate their privatization-led incentives of improving SOE performance and firm quality information with public investors in exchange for their support for the reform. Public investors trade off receiving higher lump sum consideration at the reform stage versus benefiting from greater improvements to post-reform SOE performance. Moreover, they tend to

²⁸ The statistics could slightly underestimate the actual sales of state-owned shares, because only sales of shares exceeding 1% of total shares outstanding are required to be publicly disclosed. Given that most sales of state-owned shares are in large quantity, our results provide imperfect but reasonable estimates.

²⁹ A listed firm is classified as comprehensive if it is not in the utility, real estate, manufacturing, or commercial industries.

Table 10

Post-reform changes in SOE performance and the market mechanism.

This table reports the results of the 50% quantile (median) regressions of changes in post-reform SOE operating revenue, operating profit, and stock return on consideration and public investor reform plan approval rate. The sample consists of 633 SOEs that completed the Split-share Structure Reform during 2005–2007. The unadjusted changes in SOE operating revenue and operating profit are calculated as the differences between the CPI-adjusted revenues and profits three years before and after the reform, normalized by pre-reform values. Size–industry and size–market-to-book ratio adjusted changes are calculated using the unadjusted changes in SOE variables minus median changes in the variables of the matching non-SOE benchmark portfolios by size–industry or size–market-to-book ratio. The unadjusted SOE stock returns are the Fama–French three-factor model-adjusted cumulative stock returns three years after the reform. Size–industry and size–market-to-book ratio adjusted SOE stock returns are calculated using the unadjusted SOE stock returns minus the median stock returns of the matching non-SOE benchmark portfolios by size–industry or size–market-to-book ratio. *t*-Statistics are reported in parentheses. Superscripts *, **, and *** denote the significance levels of 10%, 5%, and 1%, respectively.

	Change in operating revenue			Change in operating profit			Post-reform stock return		
	Unadjusted (%)	Size-ind. adj. (%)	Size-M/B adj. (%)	Unadjusted (%)	Size-ind. adj. (%)	Size-M/B adj. (%)	Unadjusted (%)	Size-ind. adj. (%)	Size-M/B adj. (%)
Consideration	−1.06*** (3.1)	−0.84*** (2.5)	−1.16*** (3.2)	−0.81* (1.9)	−0.72* (1.7)	−1.10*** (2.4)	0.63 (1.1)	0.72 (1.6)	0.64 (1.6)
Approval rate (%)	1.45* (1.8)	1.73** (2.0)	1.97** (2.3)	2.02** (2.0)	1.61* (1.7)	2.42*** (2.6)	0.04 (0.1)	−0.07 (0.1)	2.46** (2.2)
State-ownership (%)	0.17 (0.6)	0.35 (1.2)	0.03 (0.1)	−0.22 (0.7)	0.08 (0.2)	−0.36 (1.2)	0.00 (0.0)	0.09 (0.2)	0.11 (0.3)
Controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald test for consideration	9.79***	6.10***	10.52***	3.57*	2.82*	5.97***	1.19	0.05	2.44
Wald test for approval rate	3.15*	3.91**	5.14**	3.81**	2.83*	6.57***	0.13	0.11	4.75**

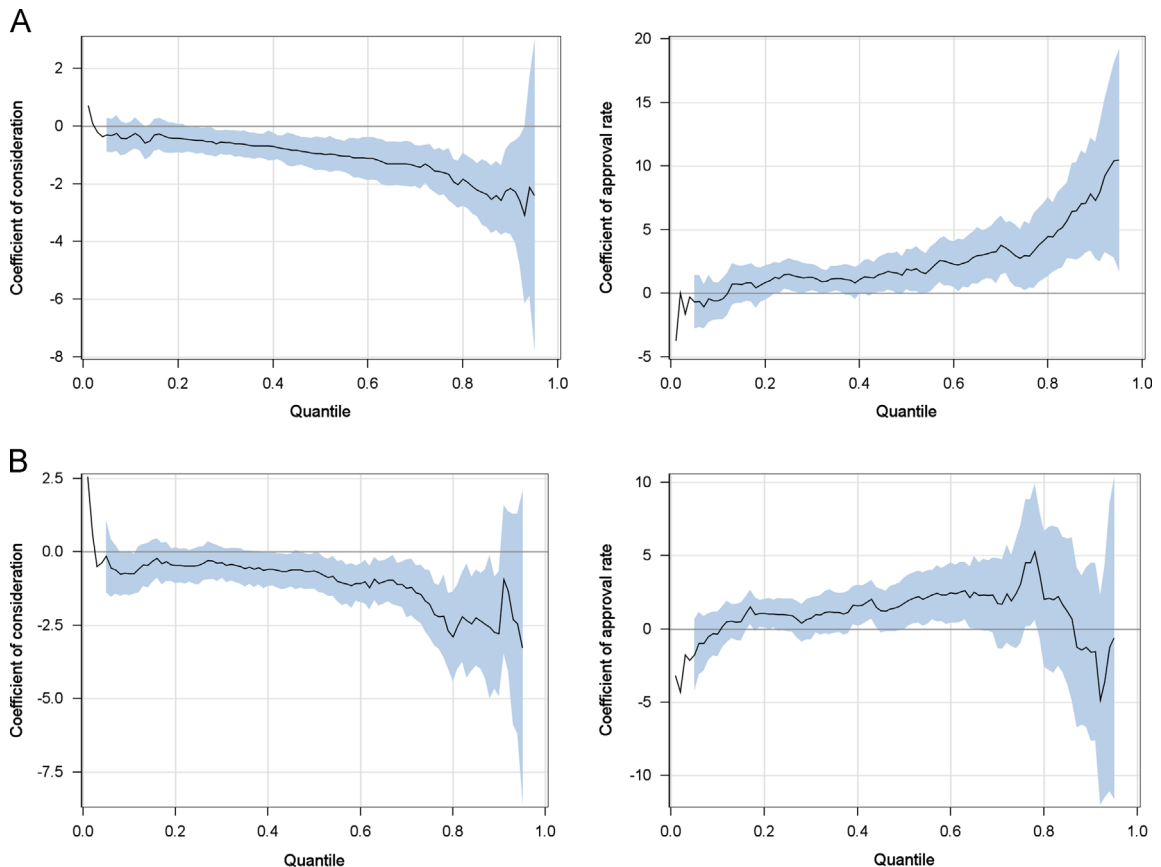


Fig. 2. Coefficients of consideration and reform plan approval rate in quantile regressions for privatization-led improvements to SOE performance. This figure depicts the estimates of the coefficients of consideration and public investor reform plan approval rate in quantile regressions. The dependent variables are changes in the size–industry adjusted SOE operating revenue and operating profit. The quantile regression method follows that in [Koenker and Bassett \(1978\)](#). The solid line represents coefficient values within a 0–100% quantile range. The gray area represents 95% confidence interval. Graph A: Size–industry adjusted operating revenue, Graph B: Size–industry adjusted operating profit.

approve reform plans with higher approval rates when stronger SOE performance is expected. Besides balancing the interests of the government and public investors, the market mechanism plays an information discovery role in facilitating privatization in the reform. It is an important element for the success of the reform and privatization.

6. Conclusions

The Split-Share Structure Reform was a landmark event in China's financial liberalization. It converted non-tradable state-owned shares into tradable shares, enabling in-depth privatization of listed SOEs. We find that SOEs experienced remarkable increases in output and employment without sacrificing operating efficiency. The expectation of privatization stimulated the incentive of government agents operating SOEs to take quick measures to improve SOE performance. We do not find that the reform improved SOE corporate governance without fundamentally changing their ownership structure. In contrast to the evidence found in other transitional economies that new management helps improve post-privatization firm performance, our results show that stimulating incumbent management's incentive with expectation of privatization also has positive effects. Market mechanism is more effective than crude top-down privatization orders in making privatization happen when China enters into an in-depth reform era. It played an important role in aligning the interests of government and public investors. These positive elements of the Split-Share Structure Reform provide useful policy implications for China's continued economic reforms.

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