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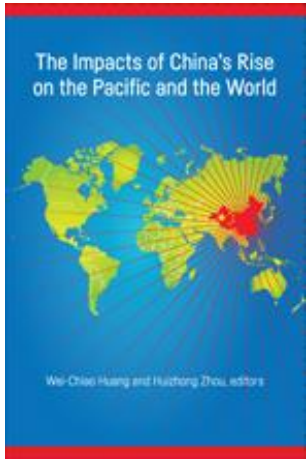
State Enterprise Reform in China: Grasp or Release?



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The Impacts of China's Rise on the Pacific and the World

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State Enterprise Reform in China

Grasp or Release?

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Beginning in the mid-1990s, the Chinese government moved aggressively to close loss-making state-owned enterprises (SOEs) and to restructure underperforming state assets deemed central to economic development. Over the next decade, the state laid off almost 50 million workers—40 percent of the public-enterprise workforce (Naughton 2007, p. 179). The adjustment of labor and other factors to this restructuring accommodated the rise of private enterprises and ushered in a sustained period of productivity growth. The wealth of newly minted entrepreneurs attested to the success of China's "privatization" of its industrial sector (Lardy 2014; Nee and Opper 2012).

While much attention has focused on the performance of China's private sector, its state sector is now coming under renewed international scrutiny. Even with the ascendancy of the private sector, China's state-owned and state-controlled enterprises have hardly disappeared and are among the country's largest firms. Geopolitically, this renewed interest is partly due to trade conflict in industries dominated by state enterprises, such as steel and shipbuilding, where shifts in global demand following the Great Recession led to global overcapacity and falling prices. Despite two decades of reform, state enterprises continue to dominate major sectors of the Chinese economy and have also emerged as global titans. Kowalski et al. (2013) investigate the extent of state ownership among the world's 2,000 largest companies—the so-called Forbes Global 2,000—and their 330,000 subsidiaries worldwide. Using an equally weighted average of shares of state-owned enterprises in sales, assets, and market value of the country's top 10 firms, they

find that China tops the list of countries with the highest state presence among its globally elite enterprises.

That state firms remain an important aspect of the Chinese economy is not a surprise since, as Naughton (2007) notes, "there has never been a clearly articulated rationale for privatization" (p. 324). Without a specific privatization policy, the nature of industrial restructuring must be discerned from the historical record. In this chapter, we examine the characteristics of firms that were retained by the Chinese state and those that were released to the private sector. We begin our analysis by tracking the evolution of enterprises away from China's state sector, a task complicated by alternative definitions of state control, limited data, and opaque ownership arrangements. An initial contribution of this chapter, then, is the provision of new estimates of the size of the state sector, with a comparison to other recent characterizations in the literature.

To better understand the factors that influenced state decision making, we review and categorize various descriptions of the objectives of both central and local governments in enterprise restructuring. We then formulate these views as hypotheses and test them using data from China's Annual Survey of Industrial Production. We employ a linear probability model to link firm characteristics to the likelihood of remaining under state control. We undertake this exercise for two time intervals: 1998–2002, a period following massive urban state-owned enterprise (SOE) restructuring and significant labor unrest; and 2002–2006, the early years of the Hu administration.[1] We then summarize the findings of recent analyses of restructuring's success in reducing factor misallocations and, hence, its contribution to productivity growth. Finally, we use our analysis of the grasp-or-release decision to highlight some of the challenges of continued SOE reforms.

OWNERSHIP RESTRUCTURING, ENTERPRISE CLASSIFICATION, AND THE EXTENT OF STATE CONTROL IN THE INDUSTRIAL SECTOR

Identification and measurement of the Chinese "state sector" are complicated by the variety of ways in which state-controlled firms are organized. According to Gan (2009), SOE restructuring stems from

policies initiated in the 1980s and early 1990 permitting changes to enterprise governance structures rather than outright privatization. The formal adoption of the Company Law in 1994 provided a legal framework into which different ownership forms could fit. The law permitted the formal conversion of state-owned enterprises to joint stock companies, allowing for the option of selling off some or all shares of the new organization (Naughton 2007, p. 301). Shareholding conversion, called "corporatization" when the state retains a controlling interest, became a broad-based initiative after 1997 when the Chinese Communist Party's Fifteenth Congress elevated the shareholding system as a vehicle for enterprise restructuring. The changing ownership composition was also shaped by the adoption at the Fifteenth Party Congress of the policy known as "grasping the large, letting go of the small" (Gan, Guo, and Xu 2015). This policy sought to protect and promote the largest, typically centrally controlled, state enterprises while spurring the privatization or exit of smaller, often loss-making, enterprises controlled by lower levels of government. The policy quickly led to dramatic changes in China's industrial sector. Jefferson et al. (2005) find that from 1997 to 2001 the number of large and medium-sized SOEs declined by over 40 percent, and the number of large and medium-sized collective enterprises declined by 35 percent, while the number of shareholding firms soared.

These policies resulted in a distinct blurring of boundaries between state-controlled and privately held enterprises. Since 2001, the evolution of the Chinese industrial sector has continued, but tracking the extent to which state control has receded is difficult. China's National Bureau of Statistics assigns each firm an ownership classification, known as its "registration status." State-owned enterprises include those that are majority owned by the central government or a local government, those registered to the state but jointly operated with a nonstate entity, and those wholly state owned. Private firms, by registration status, include those registered to natural persons, whether solely, in partnership, as limited liability enterprises, or shareholding firms. Distinctions between ownership types become truly opaque in another type of domestic registration status, legal persons. Firms registered as legal persons include limited liability and shareholding limited liability firms. Their relationship to the state is not indicated by their registration status. An additional complication is that the state may control firms in

which it has only a minority holding, firms that are correctly registered as private or foreign owned. These complexities imply that measures of the state-controlled industrial share drawn from aggregate statistics based on registration type are misleading.

Enterprises registered as legal persons are mostly shareholding firms, an organizational form integral to reform of China's state-owned enterprises (Jefferson et al. 2005). Shareholding firms may operate under state control, may be privately controlled, or may simply be "hybrid ownership." Fortunately, progress in identifying firms not classified as SOEs by registration status yet controlled by the state can be made by accessing additional information contained in China's Annual Survey of Industrial Production (ASIP). This census of all state-owned enterprises and other industrial firms with revenues above 5 million RMB is available to us for the period 1998–2006 only. The ASIP includes information on the origin of the various sources of registered capital in the firm—the state, collectives, legal persons, private persons, and foreigners.[2] This information on equity shares can be used to classify firms based on majority ownership. If 50 percent or more of equity originates from state, collective, private, or foreign sources, the enterprise can be reclassified accordingly. However, for many firms, legal person is a significant source of capital, making it impossible to classify these firms based on paid-in capital shares alone. Indeed, of the 54,320 firms officially registered as legal person, 21,910 enterprises cannot be reclassified using equity information because the majority of their capital originates from a legal person. In other words, equity shares do not allow us to completely peer around the veil of legal-person status.

Other researchers have faced this problem. Dollar and Wei (2007) add legal-person capital to private capital before calculating majority ownership. While subsequent researchers have followed the same procedure, this method ignores Huang's (2008) observation that categorizing legal-person firms as private can be misleading because "(e)ven a casual glance at the data reveals that many of these legal-person shareholding firms are among the best-known and quintessential SOEs in China" (p. 16). Huang concludes that "(t)he majority of the shareholding firms, especially the large ones, are still state-controlled" (p. 46). His observation suggests that an alternative grouping of firms, in which legal-person capital is treated as state-owned capital before calculating majority ownership, is also reasonable.[3] Kamal and Lovely (2013) take

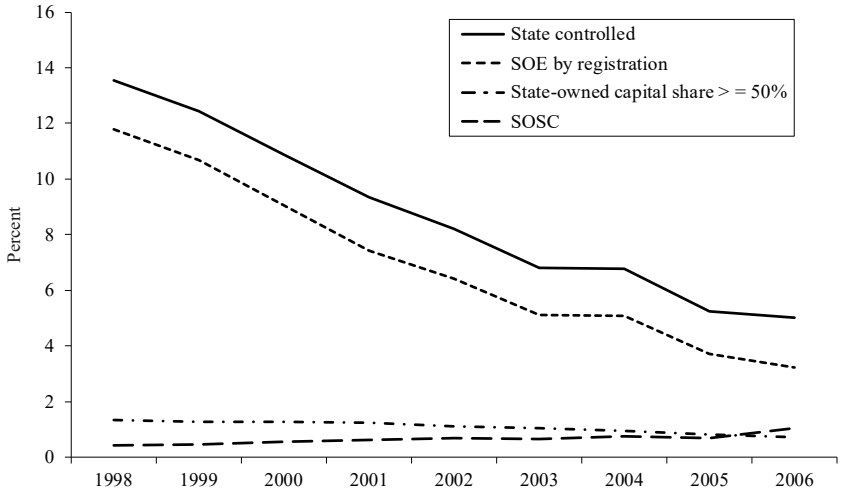
a middle approach in their study of labor misallocation: they separate legal-person enterprises from both SOEs and firms registered as privately owned.

Fortunately, the ASIP contains additional information that defines the firm's controlling shareholder as either the state, a collective, a foreigner, or a private person. Together with data on equity shares, the ASIP allows us to define state-owned and state-controlled (SOSC) firms. We define a firm as SOSC when it is registered as an SOE, when the share of registered capital held directly by the state exceeds or equals 50 percent, or when the state is reported as the controlling shareholder. The method captures those firms registered as SOEs and those in which the state holds a controlling interest, whether directly or through a holding company. Hsieh and Song (2015) use a similar method to identify state-controlled firms, and they report that this method resulted in correct categorization when they manually checked the results using information directly from firm websites.[4]

To identify enterprises that remain under state control from those that transition to another type of ownership, we need to trace firms over time. However, linking firms across years can be problematic because firm IDs may be changed or missing when there are revisions in legal registration status. We follow Brandt, Van Biesebroeck, and Zhang's (2012) method of constructing complete firm histories. We supplement matching via the firm's Legal Person Entity Code with matching based on five additional identifiers: firm name, industry code, geographic code, founding year, and name of main product. After completing this multistep procedure, we can match over time more than 95 percent of the firms in the data set.

The state sector appears to recede far less when corporatized yet state-controlled firms are included in the definition of state enterprises rather than considered private firms. Figure 5.1 shows trends in the share of total enterprises by type of ownership. When ownership is defined using NBS registration status, the number of state-owned enterprises falls by more than 90 percent between 1998 and 2006, accounting for only about 3 percent of all above-scale firms by 2006.[5] However, using information on equity shares to define ownership allows us to observe another 1 percent of firms as being state majority owned in 2006. We also find an additional 1 percent of firms for which ownership cannot be determined directly from paid-in capital shares but which are identified

Figure 5.1 Shares of Total Enterprises, by Type of State Control



SOURCE: Authors' calculations.

as state controlled by the NBS. In total, we find that about 5 percent of total enterprises are state owned and controlled in 2006.

If these adjustments seem too small to bother with, Table 5.1 shows that the state controls a much larger share of industrial output than the number of firms might suggest. As seen in Figure 5.2, firms registered as SOEs account for 15 percent of gross industrial output, even though they make up only 3 percent of all enterprises. Similarly, corporatized firms controlled by the state punch above their numbers due to their larger than average size. Firms in which the state owns 50 percent or more of registered capital provide 5.4 percent of gross output, while firms controlled by the state without having registered majority state ownership account for fully 11 percent of gross output. Altogether, as shown in Figure 5.2, SOSC enterprises provided 31.4 percent of gross industrial output by 2006, more than double the share produced by registered SOEs, and that the decline in state share appears to level out by 2005.

Figure 5.3 shows trends in output shares for SOSC firms, distinguished by their official registration type. While about 60 percent of state-controlled firms are registered as SOEs, the share of SOSC firms

Table 5.1 Enterprise Size and Performance: Linear Probability Model of Firm Remaining State Controlled or State Owned, 1998–2002 and 2002–2006

	1998–2002		2002–2006	
	(1)	(2)	(3)	(4)
ln Output value (normed)	0.0506***	0.0472***	0.0606***	0.0481***
	(0.00299)	(0.00541)	(0.00241)	(0.00740)
ln Viability	0.0491***	0.0329***	0.0352***	0.0275***
	(0.00475)	(0.00456)	(0.00661)	(0.00611)
ln Return on assets	−0.0326***	−0.0258***	−0.0340***	−0.0157***
	(0.00428)	(0.00465)	(0.00544)	(0.00480)
Observations	55,502	55,502	35,719	35,719
Industry fixed effects	No	Yes	No	Yes

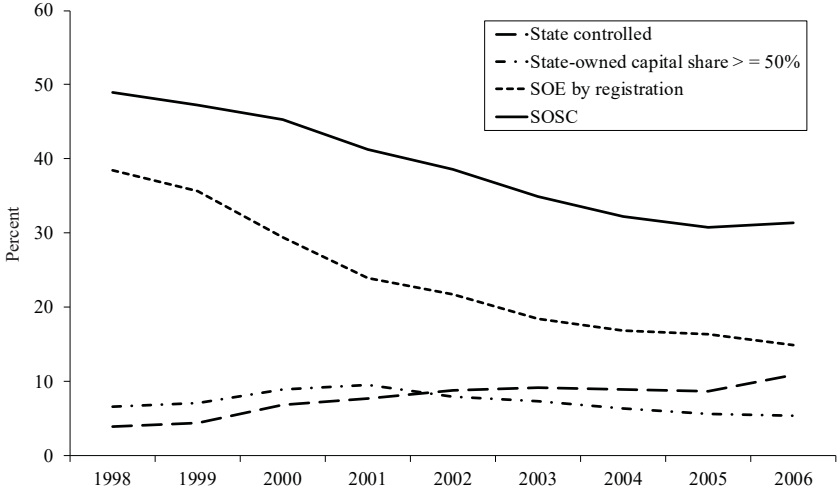
NOTE: *p < 0.1; **p < 0.05; ***p < 0.01. Dependent variable takes value of 1 if firm remains state owned or state controlled over full-time period. Robust standard errors in parentheses are clustered at the two-digit census industry code.
SOURCE: Authors' calculations.

registered as limited liability corporations grew dramatically after 2001. Recognizing that firms officially registered as legal-person enterprises are larger than average, properly classifying these organizational forms is integral to tracking the extent of state control in China's industrial sector. Proper classification leads to quite different conclusions about the extent of "privatization" from that drawn using registration type alone. We conclude that the Chinese state continues to control firms supplying more than 30 percent of industrial output and that earlier downward trends in the state share appear to level off by 2005.

GRASPING AND RELEASING

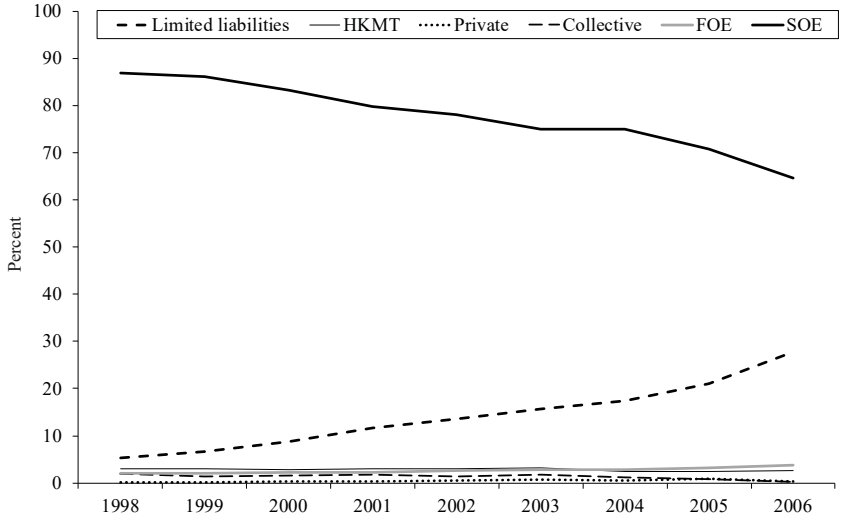
Large-scale restructuring of China's state-owned firms began in the late 1990s. As we have shown, this process resulted in a smaller share of firms owned by the state. With about a third of gross industrial output still under state control, however, we now examine the characteristics of those enterprises chosen by the state to be released and which it

Figure 5.2 Shares of Gross Industrial Output Value, by Type of State Control



SOURCE: Authors' calculations.

Figure 5.3 Shares by Registration Type among State-Owned, State-Controlled Enterprises



SOURCE: Authors' calculations.

chose to grasp. Such an analysis provides insight into both the process of sculpting the modern state sector in China, and also the problems that continued to face the state industrial sector after 2006.

The slogan "grasp the large, let go of the small" suggests that enterprise performance was a major determinant of decisions about industrial restructuring. Naughton (2007) reports that "In 'grasping the large,' policymakers sought to focus their attention on the largest, typically centrally controlled firms" (p. 31). In addition to size, the financial status of the firm likely contributed to the retention decision. An impetus for selling assets, especially at the local level, was the negative budgetary impact associated with loss-making and insolvent enterprises. Firms with debts in excess of the value of their assets were essentially bankrupt. Because of "soft budget constraints" in the period before restructuring, enterprises could lose money for a prolonged period yet continue to receive financing and investment. These injections of funds sapped the resources of local governments and contributed to concerns about government indebtedness. As reported by Gan, Guo, and Xu (2015, p. 7), by the late 1990s, "the deteriorating performance of SOEs put increasing pressure on the fiscal conditions of local governments because they are the residual claimants of the SOE earnings and some were on the verge of insolvency following the losses of their SOEs."

While selling off the shares of insolvent firms may have solved the government's problem, finding buyers for such firms would be difficult without some indication that the firm could be profitable. Consequently, profitability may also have been a factor in determining which enterprises the state retained, with better-performing firms being sold while others were held under various organizational forms. We can summarize these enterprise performance criteria for retaining a firm under state control in the following hypothesis:

H1: The Chinese state was more likely to retain control of an enterprise that, ceteris paribus, was larger, financially viable, and less profitable. These factors matter in both time periods, 1998–2002 and 2002–2006.

To test this hypothesis, we measure the size, viability, and profitability of each firm in the initial year of each time period. Table 5.2 provides descriptive statistics for all variables used in our regression analysis. We measure enterprise size as the gross value of industrial

output of the firm relative to the average output value of private firms in the same three-digit industry. Viability is measured as the ratio for the firm of total current assets to total current liabilities. Lastly, we use sales revenue divided by total assets of the enterprise as a measure of firm profitability.

Some observers express the view that privatization was shaped by a desire to continue to guide economic development through the allocation of resources to sectors with strategic importance. Naughton (2007) states that the central government concentrated its focus on energy, natural resources, and other industries with large economies of scale. These upstream industries provide inputs into many different industrial activities and thus have strategic importance in driving economic development. The state may then have sought to retain control of firms in the upstream industries.

While local governments were given de jure control rights for local SOEs in 1997, the pressures they faced to restructure were associated with their own resources and assets. Lower levels of government held assets that may have been deemed less strategically important and more tempting to use as a source of revenue. Gan, Guo, and Xu (2015) find that direct sales of firm assets to insiders was the method of privatization used most often by local governments to release local SOEs from state control. This method of privatization is the most controversial because it lacks transparency and may result in the underpricing of state assets. Thus, local governments may have found SOEs under their jurisdiction less strategically important to retain and more tempting to sell off. We can summarize these strategic importance perspectives on state control in the following hypothesis:

H2: The Chinese state was more likely to retain control of an enterprise that, ceteris paribus, was further upstream in the industrial sector and was affiliated with a higher level of government.

To measure strategic importance, we control for the degree of "upstreamness" of the three-digit industry to which the enterprise belongs. We measure this industry characteristic using the upstream index for two-digit sectors created by Tang, Wang, and Wang (2016) for China using the method of Antras et al. (2012). The index essentially measures the number of industries between a producer and the final consumer, with a higher number indicating that the firm has a

Table 5.2 Description of Variables Used in Regression Analysis

	Description	Mean 1998–2002	Mean 2002–2006
State owned or state controlled	=1 if start as SOSC and remain SOSC to end of period (see text for definition of SOSC)	0.45 (0.50)	0.39 (0.49)
ln Output value (normed)	Log of output value divided by averaged private firm's output value in same 3-digit industry	−1.38 (2.10)	−1.31 (2.09)
ln Viability	Log of total current assets divided by total current liabilities	−0.16 (0.82)	−0.13 (0.94)
ln Return on assets	Log of industrial sales revenue divided by total assets	−1.04 (1.24)	−0.95 (1.31)
Social burden	Log of the ratio of firm's industrial sales per worker to the averaged industrial sales per worker in the same 3-digit industry	−1.44 (1.36)	−1.25 (1.37)
Strategic burden	Log of ratio of industry's total export values to industry's total domestic sales	−2.84 (1.63)	−2.91 (1.61)
Upstream index	From Tang, Wang, and Wang (2014)	3.30 (0.55)	3.33 (0.56)
Central affiliated	Enterprise affiliated with central government	0.07 (0.25)	0.09 (0.28)
Province affiliated	Enterprise affiliated with a provincial government	0.13 (0.33)	0.17 (0.38)
City affiliated	Enterprise affiliated with a city government	0.25 (0.43)	0.25 (0.43)
Private competition	Share of output in 3-digit industry from private enterprises	0.04 (0.03)	0.13 (0.10)
Foreign-invested enterprise competition	Share of output in 3-digit industry from foreign-invested enterprises	0.11 (0.09)	0.12 (0.11)
Central state-owned enterprise competition	Share of output in 3-digit industry from state-owned enterprises	0.09 (0.16)	0.08 (0.16)

NOTE: Standard deviations are in parentheses.
SOURCE: Data drawn from China's NBS Annual Survey of Industrial Production.

more upstream location in the production chain. We also include a set of dummy variables indicating the level of government with which the enterprise is affiliated. The ASIP contains this information, distinguishing between central, provincial, city, or town government affiliation.

The last set of explanations for privatization decisions refers to what we can term "legacy burdens." These burdens reflect the use of state enterprises to achieve goals other than production and take three forms: social burdens, strategic burdens, and competitive burdens. Because these burdens reduce the efficiency and profitability of state enterprises, they distinguish firms that may be difficult to sell off without prior restructuring and that fill an important and continuing social obligation.

Prior to the mid-1990s, state enterprises often served to ensure full employment in urban areas, a responsibility for social stability termed the "social burden" by Lin (2012). Cai, Park, and Zhao (2008) explain that SOE managers were prohibited from firing urban workers and that municipal governments continued to place workers into state-sector jobs well into the 1990s even when they were not required. We hypothesize that excess staffing would contribute to the desirability of privatizing a firm to increase productivity, but the problem of uninsured and unemployed workers would remain. Indeed, Lin argues that much of this responsibility remains today with SOEs, who still shoulder a social burden.

Another burden identified by Lin (2012) is what he terms the "strategic burden." This handicap resulted from the presence of state enterprises in sectors deemed strategically important for economic development but not in line with China's comparative advantage. These enterprises would not be viable without significant state support, including competitive restrictions. To the extent that the state continues to seek industrial upgrading, they may have retained control of enterprises in these "comparative-advantage-defying" industries.

A final burden for state enterprises flows from a competitive squeeze experienced by local SOEs operating in sectors dominated by foreign-invested firms and large, centrally controlled SOEs. These enterprises may not be able to withstand the pressure of more advanced competitors and, thus, may be allowed to go bankrupt or be sold.

We can summarize these legacy-burden considerations in the following hypothesis.

H3: The Chinese state was more likely to retain control of an enterprise if, ceteris paribus, it bore a larger social burden; it bore a strategic burden related to comparative disadvantage; it was subject to a competitive squeeze from foreign firms and large SOEs.

To measure the social burden borne by a firm, we create an index of overstaffing based on average labor productivity in the industry. Specifically, we calculate sales revenue per employee in each given firm and divide by the average sales per employee in the firm's three-digit industry. Higher values of the index indicate that the firm has a higher labor productivity relative to the average firm in the industry. The strategic burden reflects an industry's comparative advantage, so we create an industry-level measure based on the ratio of export sales to total domestic sales. Higher values of this measure indicate that the industry has strong international sales. Lastly, we control for the competitive squeeze by including the market share in each three-digit industry of private firms, foreign-invested enterprises, and centrally affiliated SOEs.

REGRESSION RESULTS

To test our hypotheses, we estimate a linear probability model of the likelihood that a state enterprise remains active and state controlled by the end of the period.[6] Our dependent variable takes the value of unity if an initially state-controlled firm remains state controlled, using the method of classifying enterprises as SOSC described above, until the last year in the interval. Since China experienced a change of regime (President Hu took office in December 2002) and reemphasized deepening SOE reform in the 16th CPC Plenary Session, we divide our sample into two periods. The sample contains 67,509 initially state-controlled firms for the period 1998–2002 and 40,857 initially state-controlled firms for the period 2002–2006.

Table 5.1 provides the results of the linear probability estimation, including only those variables related to firm performance. We use these results to test the hypothesis that the government was more likely to retain control of an enterprise that, ceteris paribus, was larger, financially viable, and less profitable. For each period we provide estimates with and without the inclusion of an industry fixed effect.

As seen in Table 5.1, all three firm performance indicators are significant determinants of state retention. The estimated coefficient on enterprise size, normed by average industry output value, is positive and highly significant in both time periods. The coefficient, when estimated with industry fixed effects, is of very similar magnitude in both periods. A 1 percent increase in a firm's output value relative to the industry average, all else equal, raises the probability that it is retained by the state by about 5 percentage points.

A firm's financial viability, measured as the ratio of its assets to its liabilities, is also a significant determinant of state retention. When we include industry fixed effects, the estimated coefficient implies that a 1 percent increase in this ratio raises the probability that the state maintains control by about 3 percentage points. This finding is consistent with the view that the state sold off enterprises that were bankrupt.

Our last indicator of firm performance is ROA, the ratio of firm revenues to assets. The estimated coefficient is negative and highly significant, even when we include industry fixed effects. A 1 percent increase in this revenue ratio reduces the likelihood of state retention by 2.6 percentage points over the period 1998–2002 and by 1.6 points over the period 2002–2006. This finding is consistent with state retention of underperforming assets. In the data set, 45 percent of initially SOSC firms remain state controlled by 2002 and 39 percent by 2006, so the magnitudes of the marginal effects on retention decisions of all three firm performance factors appear to be both economically and statistically significant.

We extend our analysis with the results shown in Table 5.3, which provides coefficient estimates obtained by adding the strategic importance characteristics to our linear probability model. We hypothesize that the Chinese state was more likely to retain control of an enterprise that, ceteris paribus, was further upstream in the industrial sector and was affiliated with a higher level of government. Since our upstream index is an industry characteristic, we do not include industry fixed effects in these models.

Surprisingly, we find that the upstreamness of the firm's industry is not significantly correlated with the probability of state retention in either period. Moreover, the level of governmental affiliation has no significant relation to retained control over the period 1998–2002, during which the Chinese Communist Party's Central Committee had the

Table 5.3 Strategic Centrality: Linear Probability Model of Firm Remaining State Controlled or State Owned, 1998–2002 and 2002–2006

	1998–2002		2002–2006	
	(1)	(2)	(3)	(4)
ln Output value (normed)	0.0533***	0.0458***	0.0588***	0.0474***
	(0.00270)	(0.00239)	(0.00399)	(0.00390)
ln Viability	0.0467***	0.0345***	0.0489***	0.0321***
	(0.00471)	(0.00291)	(0.00472)	(0.00393)
ln Return on assets	−0.0350***	−0.0272***	−0.0269***	−0.0145***
	(0.00439)	(0.00374)	(0.00410)	(0.00391)
Upstream index	0.0150	−0.00899	0.0164	−0.00222
	(0.0197)	(0.0101)	(0.0228)	(0.0115)
Central affiliated		0.144		0.216**
		(0.150)		(0.0939)
Province affiliated		0.117		0.167***
		(0.0913)		(0.0510)
City affiliated		−0.00493		0.0745
		(0.0488)		(0.0458)
Observations	43,819	43,819	24,686	24,686
Industry fixed effects	No	No	No	No

NOTE: *p < 0.1; **p < 0.05; ***p < 0. 01. Dependent variable takes value of 1 if firm remains state owned or state controlled over full time period. Robust standard errors in parentheses are clustered at the two-digit census industry code.
SOURCE: Authors' calculations.

political support necessary to issue an official policy statement on the urgency of reform of state-owned enterprises (Central Committee of the Communist Party of China 1999). Our results suggest that the party was then able to align the direction of reform at all levels of government.

During the first years of the Hu administration, however, the level of state affiliation appears to have become a powerful determinant of whether a firm remained under state control. Being affiliated with the central government raised the likelihood of remaining state controlled by an estimated 21.6 percentage points, while affiliation with a province or provincial-level city raised the likelihood of retention by 16.7 percent, both measured relative to the likelihood of retention of firms affiliated with city or town governments. These estimated magnitudes are quite large and suggest that corporatization, rather than privatiza-

tion, became the mode of choice for higher-level governments seeking to improve the performance of their state assets. Enterprises associated with local governments were more likely to be privatized or closed, all else equal, than those affiliated with higher levels.

Table 5.4 provides additional results that include measures of the legacy burdens faced by each state-controlled firm. We hypothesize that an enterprise was more likely to be retained if it bore a larger social burden, bore a strategic burden related to comparative disadvantage, and was subject to a competitive squeeze from foreign firms and large SOEs. Among all these factors, our results suggest that only the social burden is a significant determinant of state privatization decisions. Estimate coefficients for the strategic burden variable, defined as the export success of the firm's industry, and all measures of the competitive squeeze faced by local SOEs are statistically insignificant in both periods. In contrast, the coefficient for social burden is significant in both periods. Defined as the firm's sales per worker relative to the average sales per worker in the industry, social burden is a measure of relative labor productivity. Our results indicate that a 1 percent increase in this ratio reduces the likelihood of state retention by 2.7 percentage points in the first period, 1998–2002, and by 0.8 points in the second period, 2002–2006. Essentially, firms with better labor productivity were more likely to be privatized or exit than to remain state controlled. This finding supports the view that restructuring did not discharge all SOE social burdens and that the state sector continues to some extent to bear the legacy of social stability goals, as argued by Lin (2012).

STATE RESTRUCTURING AND ECONOMIC PERFORMANCE

Our regression analysis indicates that larger, more financially stable firms, especially those affiliated with higher levels of government, were more likely to remain under state control. We also find that the state was less likely to shed enterprises with low labor productivity. These patterns are consistent with the creation of a state sector comprising firms with dominant industry positions but possibly weak performance. Explicit comparison of state firms to nonstate firms, a task that has recently been undertaken by several groups of researchers, is important

Table 5.4 Legacy Burdens and Competitive Squeeze: Linear Probability Model of Firm Remaining State Controlled or State Owned, 1998–2002 and 2002–2006

	1998–2002		2002–2006	
	(1)	(2)	(3)	(4)
ln Output value (normed)	0.0541***	0.0545***	0.0507***	0.0508***
	(0.00290)	(0.00296)	(0.00429)	(0.00433)
ln Viability	0.0387***	0.0379***	0.0332***	0.0324***
	(0.00401)	(0.00391)	(0.00420)	(0.00385)
ln Return on assets	–0.0155***	–0.0158***	–0.0111***	–0.0111***
	(0.00316)	(0.00339)	(0.00378)	(0.00384)
Upstream index	–0.00814	–0.00954	–0.00334	0.000485
	(0.0106)	(0.0128)	(0.0126)	(0.0142)
Central affiliated	0.161	0.132	0.205*	0.199***
	(0.171)	(0.159)	(0.101)	(0.0559)
Province affiliated	0.147	0.134	0.152***	0.145***
	(0.105)	(0.102)	(0.0515)	(0.0514)
City affiliated	0.00551	–0.00277	0.0669	0.0637
	(0.0624)	(0.0611)	(0.0432)	(0.0386)
Social burden	–0.0273***	–0.0271***	–0.00887**	–0.00853**
	(0.00471)	(0.00471)	(0.00390)	(0.00363)
Strategic burden	–0.0102	–0.0100	0.00196	–0.00130
	(0.00884)	(0.00902)	(0.00570)	(0.00738)
Private competition		0.0775		0.0269
		(0.183)		(0.0865)
Foreign-invested competition		0.0132		0.0928
		(0.0839)		(0.0935)
State-owned enterprise competition		0.121*		0.0147
		(0.0588)		(0.132)
Observations	40,317	40,317	24,686	24,686
Industry fixed effects	No	No	No	No

NOTE: *p < 0.1; **p < 0.05; ***p < 0.01. Dependent variable takes value of 1 if firm remains state owned or state controlled over full time period. Robust standard errors in parentheses are clustered at the two-digit census industry code.

SOURCE: Authors' calculations.

because if factor productivity is systematically related to state status, and if inputs are allocated to state-controlled enterprises in a discriminatory manner, the economy will not perform at its full potential.

Performance gaps between SOEs and other types of firms were present early in the reform process: Brandt, Tombe, and Zhu (2013) find significant productivity differences between the state and the nonstate in nonagricultural sectors from 1985 to 2007. By their estimates, over the entire period, misallocation of factors between the state and nonstate sectors and across provinces lowered aggregate nonagricultural total factor productivity (TFP) by an average of 20 percent. Interestingly, given the massive layoffs of state workers beginning in the mid-1990s, these losses—after initially declining—increased appreciably as retrenchment expanded. Brandt, Tombe, and Zhu attribute these trends almost exclusively to increasing misallocation of capital between state and nonstate sectors caused by contemporaneous government policies that encouraged investments in state enterprises at the expense of investments in the more productive nonstate sector.

Hsieh and Klenow (2009) also emphasize the systematic distortions caused by preferential access to capital in their assessment of the economic cost of an inefficient state sector. Relying on firm-level data to calculate total factor productivity, measured by revenue productivity, for Chinese firms over the period 1998–2005, they find that state-owned firms exhibit 41 percent lower TFP than nonstate firms, an outcome consistent with the provision of subsidies to these firms to remain active. These findings agree with Dollar and Wei (2007), who also find lower productivity at state-owned firms in China during this time.

Misallocation of labor has also been found by researchers using Chinese microdata. Fleisher et al. (2011) find that the marginal product of both highly and less-educated workers is lower in SOEs than in domestic private or foreign-invested firms. Kamal and Lovely (2013) also focus on the allocation of labor across enterprises with a special emphasis on how SOEs compare to enterprises owned by legal persons, a category that includes "corporatized" state-owned firms. They calculate the marginal revenue product of labor for all firms in the ASIP during two periods, 2001–2004 and 2004–2007. They find that labor productivity varies systematically within industries by ownership type and that all organizational forms, on average, exhibit higher labor productivities than do SOEs. Indeed, labor in enterprises registered as legal

persons had a higher average product than labor employed in private firms. Kamal and Lovely also find that labor productivity differentials fell over time, with the gap between SOEs and other firm types falling by about half between the two periods they analyze.

Several recent studies account for the sources of China's economic growth, attempting to discern the particular contribution of SOE restructuring. Brandt, Van Biesebroeck, and Zhang (2012) estimate TFP at the firm level using the ASIP for the period 1998–2007. They find that the main source of growing aggregate TFP is productivity improvement in continuing firms and the entry of new firms with higher productivity. They also find that large Chinese firms increased productivity at a faster than average rate, and the restructuring of large state-owned firms was one driver for this pattern. The authors identify an important dynamic as the state sector receded: "The relative success in attracting new input factors determined relative growth rates. New state firms that appeared between 1998 and 2007 were able to produce almost five times as much value-added as disappearing state firms, even though their real capital stock only grew marginally and employment was a quarter lower" (p. 35). Despite this positive dynamic pattern, Brandt, Van Biesebroeck, and Zhang suggest that biases in favor of state-connected firms likely depressed productivity growth after 2007.

Hsieh and Song (2015) measure the quantitative importance of the restructuring policies pursued from 1998 to 2007 on aggregate productivity growth. They find that reforms were potentially responsible for 20 percent of aggregate output by 2007. Explicitly comparing surviving state-owned firms to those that were privatized, Hsieh and Song find that for both types the labor productivity gap with surviving private firms narrowed, a finding consistent with Kamal and Lovely (2013), while the capital productivity gap narrowed by much less. Indeed, their estimates indicate that as late as 2007, capital productivity of state-owned firms was less than 50 percent of private firms.

In light of our estimates, the lower productivity of state-controlled firms appears a natural consequence of how enterprises were grasped and released. Our linear probability model estimates suggest that the state was more likely to retain control of firms that produced low revenues relative to assets and that exhibited relatively low labor productivity. The picture that emerges is one in which the state sector was shaped by retention of firms that required continued preferential access

to capital and that suffered from the failure to develop adequate alternative policies for redundant workers. It is not surprising, therefore, that average state sector productivity continued to lag behind the private sector, despite innovation in the form of state control.

CHALLENGES FOR THE FUTURE

After several decades of retrenchment, the Chinese state remains a dominant player in several strategic industries. State-controlled enterprises provide most of the output in the heavy industries, including oil production and distribution, minerals and mining, steel, shipbuilding, and transportation equipment. The state also continues to control important pieces of the service sector: construction, utilities, financial services, media, and air travel and logistics.

The outlook for the foreseeable future is one in which the Chinese state continues to play a major role in the economy. Hsieh and Song (2015) find that after 2005, privatization rates declined on average even though they increased for small firms. Based on an analysis of industry-level data, they also suggest that there was little convergence in capital productivity from 2007 to 2012. This finding suggests a continuing cost in terms of lost national income, especially since, according to China's NBS, "state-owned and controlled enterprises" accounted for 41 percent of fixed asset investment from 2004 to 2012.

A recent study from Goldman Sachs Investment Strategy Group (2016) also supports the view that the return on state sector assets continues to lag. They report that "about 150,000 SOEs control over $15 trillion of assets in China, which in aggregate and excluding financial institutions returned 2.4 percent as of 2014" (p. 26). This return on assets can be compared to a 3.1 percent return estimated for comparable Chinese listed companies and 6.4 percent for U.S. companies. These numbers indicate continuing low profitability for Chinese SOEs.

Aside from lost productivity, continued differential investment into state enterprises may make the goal of macroeconomic rebalancing more difficult to achieve. To raise consumption, Chinese households must receive a larger share of aggregate income. However, while some parts of the state sector are very profitable, almost none of this profit

is returned to the public for services or to reduce taxes. Rather, it is reinvested by the state sector. The likely response of households to this continuing pattern is to continue to hold high savings balances. Because continued investment in the state sector produces low returns or is non-productive, households may guard against the effect of future financial repression by saving for future higher taxes or service cuts. Investment in the state sector, in this sense, conflicts with the goal of pivoting the economy toward consumption-led growth.

In 2015, the CPC Central Committee and State Council issued guidelines for SOE reform emphasizing the desire for "mixed ownership," with private investors becoming shareholders in state-controlled firms (*Xinhua* 2015). Our analysis of the history of grasping and releasing suggests that the state will continue to control the largest firms, especially those affiliated with higher levels of government, in a variety of forms. Our review of recent assessments of the role of SOE reform in China's growth suggests that significant productivity gains have stemmed from privatization and corporatization. Despite these gains, however, SOEs as a whole continue to provide subpar returns on assets while receiving a disproportionate share of total investment. How much more their performance can be enhanced by further promotion of mixed ownership without full privatization remains an open question.

Notes

1. To flag wavering commitment to continued adjustment, a policy directive was issued in 1999 emphasizing the urgency of continued SOE reforms. See Central Committee of the Communist Party of China (1999).
2. Foreign-owned includes capital from Hong Kong, Macao, Taiwan, and all other foreign sources.
3. Other methods for classifying firms have also been used. For example, Brandt, Van Biesebroeck, and Zhang (2012) use equity shares to classify firms as state, private, or hybrid.
4. Hsieh and Song (2015) do not select firms based on registration type, whereas we include registered SOEs as SOSC firms. This difference in method makes only a minor difference in the resulting state share estimates, as registered capital held by the state in most registered SOEs exceeds 50 percent.
5. Collective enterprises also declined sharply in number, falling 85 percent over the period. In contrast, firms registered as private enterprises rose sharply—the number of private firms grew 670 percent and constituted over half of all above-scale firms by 2006. The number of firms registered as legal persons, most of which are

shareholding enterprises, rose 160 percent by 2006. See Kamal and Lovely (2013) for more details.

6. A drawback of the linear probability model is that the estimated coefficients can imply probabilities outside the unit interval [0,1]. The model also implies constant marginal effects. We use the linear probability model here because the coefficient values permit straightforward interpretation. When we use a logit model, our qualitative results remain unchanged.

References

Antras, Pol, Daviin Chor, Thibault Fally, and Russell Hillberry. 2012. "Measuring the Upstreamness of Production and Trade Flows." *American Economic Review Papers and Proceedings* 102(3): 412–416.

Brandt, Loren, Johannes Van Biesebroeck, and Yifan Zhang. 2012. "Creative Accounting or Creative Destruction? Firm-level Productivity Growth in Chinese Manufacturing." *Journal of Development Economics* 97(2): 339–351.

Brandt, Loren, Trevor Tombe, and Xiadong Zhu. 2013. "Factor Market Distortions across Time, Space, and Sectors in China." *Review of Economic Dynamics* 16(1): 39–58.

Cai, Fang, Albert Park, and Yaohui Zhao. 2008. "The Chinese Labor Market in the Reform Era." In *China's Great Economic Transformation*, Loren Brandt and Thomas G. Rawski, eds. New York: Cambridge University Press, pp. 167–214.

Central Committee of the Communist Party of China. 1999. "The Decision of the Central Committee of the Communist Party of China on Major Issues Concerning the Reform and Development of State-Owned Enterprises." Adopted at the Fourth Plenum of the Fifteenth Communist Party of China Central Committee on September 22. http://en.pkulaw.cn/display.aspx?cgid=23496&lib=law (accessed May 2, 2017).

Dollar, David, and Shang-Jin Wei. 2007. "Das (Wasted) Kapital: Firm Ownership and Investment Efficiency in China." NBER Working Paper No. 13103. Cambridge, MA: National Bureau of Economic Research.

Fleisher, Belton M., Yifan Hu, Haizheng Li, and Seonghoon Kim. 2011. "Economic Transition, Higher Education, and Worker Productivity in China." *Journal of Development Economics* 94(1): 86–94.

Gan, Jie. 2009. "Privatization in China: Experiences and Lesson." In *China's Emerging Financial Markets: Challenges and Opportunities*, James R. Barth, John A. Tatom, and Glenn Yago, eds. New York: Springer, pp. 581–592.

Gan, Jie, Yan Guo, and Cheng-Gang Xu. 2015. "China's Decentralized Privatization and Change of Control Rights." CEPR Discussion Paper No. DP10331. London: Centre for Economic Policy Research.

Goldman Sachs Investment Strategy Group. 2016. *Walled In: China's Great Dilemma*. New York: Goldman Sachs, Investment Management Division. http://www.goldmansachs.com/what-we-do/investment-management/private-wealth-management/intellectual-capital/isg-china-insight-2016.pdf (accessed May 3, 2017).

Hsieh, Chang-Tai, and Peter J. Klenow. 2009. "Misallocation and Manufacturing TFP in China and India." *Quarterly Journal of Economics* 124(4): 1403–1448.

Hsieh, Chang-Tai, and Zheng (Michael) Song. 2015. "Grasp the Large, Let Go of the Small: The Transformation of the State Sector in China." *Brookings Papers on Economic Activity* (Spring): 295–346.

Huang, Yasheng. 2008. *Capitalism with Chinese Characteristics: Entrepreneurship and the State*. New York: Cambridge University Press.

Jefferson, Gary H., Su Jian, Jiang Yuan, and Yu Xinhua. 2005. "China's Shareholding Reform: Effects on Enterprise Performance." In *Reality Check: The Distributional Impact of Privatization in Developing Countries*, John Nellis and Nancy Birdsall, eds. Washington, DC: Center for Global Development, pp. 353–388.

Kamal, Fariha, and Mary E. Lovely. 2013. "Labor Allocation in China: Implicit Taxation of the Heterogeneous Non-State Sector." *CESifo Economic Studies* 59(4): 731–758.

Kowalski, Przemyslaw, Max Büge, Monica Sztajerowska, and Matias Egeland. 2013. "State-Owned Enterprises: Trade Effects and Policy Implications." OECD Trade Policy Paper No. 147. Paris: Organisation for Economic Co-operation and Development.

Lardy, Nicholas R. 2014. *Markets over Mao: The Rise of Private Business in China*. Washington, DC: Peterson Institute for International Economics.

Lin, Justin Yifu. 2012. *Demystifying the Chinese Economy*. Cambridge: Cambridge University Press.

Naughton, Barry J. 2007. *The Chinese Economy: Transitions and Growth.* Cambridge, MA: MIT Press.

Nee, Victor, and Sonja Opper. 2012. *Capitalism from Below: Markets and Institutional Change in China*. Cambridge, MA: Harvard University Press.

Tang, Heiwai, Fei Wang, and Zhi Wang. 2016. "The Domestic Segment of Global Value Chains in China." Unpublished paper. Washington, DC: School of Advanced International Studies, Johns Hopkins University.

Xinhua. 2015. "China Issues Guidelines to Deepen SOE Reforms." September 13. www.xinhuanet.com+c_134620039.htm (accessed June 17, 2017).