
China's Shareholding Reform: Effects on Enterprise Performance

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Over the past two decades, ownership structure of Chinese enterprises has changed dramatically. In 1980, China's industrial sector consisted almost exclusively of state-owned enterprises (SOEs) and collective-owned enterprises (COEs). Subsequently, numbers of SOEs and COEs rose; however, as table 11.1 shows, by 1995, they were outnumbered by the infusion of newly created enterprises: more than 29,000 foreign and overseas firms, a proliferation of shareholding enterprises (SHRs), and nearly 4,000 fully private companies. Some eight million individually owned enterprises with eight or fewer employees added a new dimension to China's industrial enterprise sector, unanticipated in 1980.

In 1998, China's National Bureau of Statistics (NBS) revised its formal statistical system to include broad statistical coverage for all of China's SOEs and all other industrial enterprises with more than 5 million yuan in

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Table 11.1 Change in ownership distribution of industrial enterprises in China (number of enterprises)

Measure	Old accounting system ^a			New accounting system ^b	
	1980	1993	1997	1998	2001
Ownership type					
State	83,400	80,586	84,397	64,737	46,767
Collective	293,500	339,617	319,438	47,745	31,018
Hong Kong, Macao, and Taiwan	n.a.	11,621	3,020	15,725	18,257
Foreign	n.a.	8,434	19,861	10,717	13,166
Shareholding	n.a.	2,579	3,898	4,120	5,692
Private	n.a.	n.a.	13,188	10,667	36,218
Other domestic ^c	400	6,379	24,704	11,369	20,138
Total in the system (A)	377,300	449,216	468,506	165,080	171,256
National total	n.a.	9,911,600	7,922,900	7,974,600	n.a.
Of which: Individual enterprises	n.a.	7,971,200	5,974,700	6,033,800	n.a.
Other [including (A)]	n.a.	1,940,400	1,948,200	1,940,800	n.a.

n.a. = not available

Other = Other enterprises is derived by deducting the number of individual enterprises from the national total.

a. Includes all industrial enterprises that operate as independent accounting units at or above the township level.

b. Includes all state-owned enterprises (SOEs), plus nonstate enterprises that report annual sales in excess of 5 million yuan.

c. Computed as the difference between total in row (A) and the ownership types listed above.

Sources: NBS (1980 data in NBS, 1985, p. 305; 1993 data in NBS 1994, pp. 374, 378; 1997 data in NBS 1998 (Industry section); 1998 and 2001 data in NBS, 2003, pp. 462–463.

sales per year.¹ Table 11.1 shows that, in 2001, among the 171,256 enterprises with broad statistical coverage, approximately three-quarters operated outside the state sector.² The 36,000 private-sector firms, with sales in excess of 5 million yuan, exceeded the number of COEs and approached the number of surviving SOEs. In that year, the 46,767 reporting SOEs represented a precipitous decline from the number recorded four years earlier. Many SOEs had been converted into SHRs, for which the number of firms in excess of 5 million yuan had grown to 5,692 by 2001.

Indeed, since the late 1990s, conversion of former SOEs and COEs into SKTs has been China's principal mode of enterprise restructuring. Such conversion always entails a change in the firm's formal ownership classification; it generally involves corporatization, with establishment of a board of directors consisting of major shareholder representatives (i.e., legal persons [*faren*]), and frequently involves infusion of new assets from outside the state system, sometimes through initial public offerings. At least during

1. The scope of enterprises enjoying full coverage includes all SOEs, regardless of annual sales.

2. In the year 2000, these larger enterprises (with sales in excess of 5 million yuan) accounted for approximately 56 percent of China's total reported industrial output. See *China Statistical Yearbook* (NBS 2001, 49, 416).

the duration of this study's dataset, conversions of SOEs into shareholder firms did not necessarily lead to private majority ownership. This wide variety of shareholding conversions constitutes the focus of this chapter.

In addition to examining conventional measures—labor and capital productivity and profitability—we also consider conversion's effects on employment and wages, taxes, and two dynamic measures of enterprise performance: (1) research and development (R&D) expenditures, and (2) new product sales. A central objective of this analysis is to identify the distributive effects of shareholder reform on key stakeholders.

This study explicitly distinguishes between two channels of conversion's effects: (1) the direct effect on enterprise performance, holding constant the firm's asset mix, and (2) the induced effect, resulting from the ability of converted firms to attract new investment from outside the state sector. We document the range of effects of nonstate investment on firm performance for both formally converted and unconverted firms.

Ownership Reform: An Overview

China's enterprise reform has spanned four related processes:

- entry of many new, nonstate enterprises;
- reform of incentive structures within established public-ownership systems, such as strengthening managerial incentives through the contract responsibility system;
- change in asset structures resulting from nonstate investment in the state sector; and
- outright conversion of enterprises, usually from state or collective ownership to another formal ownership classification (we argue that this fourth process can be viewed as the outcome of the first three).

New Entry

Until the mid-1990s, the most dramatic avenue of ownership reform in Chinese industry was the entry of new firms through (1) collectives, mainly township and village enterprises (TVEs), during the 1980s;³ (2) individually owned enterprises (*getihu*) with eight or fewer employees, whose numbers proliferated into the millions by 1994; and (3) foreign-owned enterprises

3. Subsequent to the conversion of commune enterprises to TVEs in the early 1980s, many townships and villages, in an effort to build on their success, established new TVEs.

(FORs), from investors in Hong Kong, Macao, and Taiwan (HKT) and foreign sources, primarily Organization for Economic Cooperation and Development (OECD) and Southeast Asian countries. Table 11.1 shows the magnitude of new entry: Relative to 1980, the number of industrial enterprises in China had, by 1994, multiplied by a factor of approximately 25. One consequence of this rapid entry of both domestic and foreign investment was intense competition in many sectors, which spurred a secular decline in profitability across all ownership types. The resulting erosion of monopoly rents in state industry motivated a search throughout Chinese industry for technical innovations and new governance mechanisms.⁴

Reform of Control Rights

The enterprise contract responsibility system, introduced in the mid-1980s, was intended to strengthen and clarify the incentives and rewards system for SOE managers and workers, without extending to ownership change. Jefferson, Zhang, and Zhao (1998) and Jefferson, Lu, and Zhao (1998) document the vertical reassignment of control rights from government supervisory agencies to enterprises and the horizontal allocation of managerial control rights among managers, workers' councils, and party secretaries within enterprises.

The restructuring of SOEs without formal ownership conversion met with limited success. McMillan and Naughton (1992) found that managers responded to expanded autonomy, including greater profit retention, by strengthening worker discipline, increasing the proportion of workers' income paid through bonuses, and raising the fraction of workers on fixed-term contracts. However, while most studies document efficiency gains in the state sector, productivity growth in state industry has generally lagged outside the state sector (Jefferson et al. 2000). One important outcome of these reforms was the emergence of a managerial class, with strong vested interest in privatization.

Changing Asset Structure

In China's enterprise sector, the association between formal ownership classification and the assets ownership structure has become increasingly fluid. For example, in this study's dataset of large- and medium-sized enterprises for 1999, 1,417 of the approximately 11,000 companies classified as SOEs reported a minority of state-owned assets. Conversely, 1,935 of the more than 11,000 so-called nonstate enterprises reported that most of their assets were state owned. These somewhat confusing patterns of asset ownership across the range of ownership classifications call into question the formal

4. For documentation on the rise of state-industry competition, see Naughton (1992).

classification system. The following discussion on the historical progression of China's ownership reform shows that asset restructuring often created de facto conversion, making formal conversion a mere formality.

Conversion

In the mid-1990s, the results of new entry, which fostered competition, eroded profit margins and intensified the search for technical and organizational change; strengthened managerial control, which motivated the quest for privatization; and increased accumulation of nonstate assets, which contributed to the de facto erosion of government control and created pressures for deep restructuring, including formal conversion of SOEs (Su and Jefferson 2003). At the same time, the accumulation of nonperforming loans and attention to financial stability associated with the Asian financial crisis and the Chinese leadership's quest for entry into the World Trade Organization (WTO) magnified pressures for enterprise restructuring.

In response to these systemic pressures and the leadership's search for improved efficiency and financial performance, while avoiding the ideological and political perils of extensive, overt private ownership, three restructuring policies emerged during the mid-1990s. The first was a furlough policy (*xiagang*), which, by the end of the decade, had led to the laying off of some 6 million of the 44 million SOE industrial workforce (Rawski 2002). In the late 1990s, two additional policy initiatives shifted the locus of enterprise reform to the formal conversion of both state and collective enterprise. As it diminished the role of the state sector as the locus of guaranteed employment, the government's furlough program made conversion more politically feasible.

Under the slogan "retain the large, release the small" (*juada fangxiao*), China's leadership, in principle, mandated converting all but the largest 300 or so of the nation's industrial SOEs. As part of this initiative, Premier Zhu Rongji placed China's loss-making SOEs on a strict three-year schedule, during which time they were to implement a "modern enterprise system" and convert losses to surpluses. The principal response to these mandates was rapid acceleration in the number of conversions across China's state and collective sectors.

Although the shareholding experiment was first introduced in 1993, it was not until the restructuring initiatives of 1997–98 that shareholding conversion became a broad-based initiative, involving the conversion of numerous SOEs and COEs. In 1997, the Chinese Communist Party's 15th Party Congress made the shareholding system a centerpiece of China's enterprise restructuring. While formal privatization was ruled out for ideological reasons, the shareholding experiment was widely viewed as a covert mandate for privatization (Li, Li, and Zhang 2000, 269). During 1997–2001, the number of registered SOEs declined by nearly half. According to Fan

(2002, 3), “preliminary provincial data indicate that, in some regions, more than 70 percent of small SOEs have been privatized or restructured.” This SOE conversion was not limited to small-sized enterprises. Over this period, the number of large- and medium-sized SOEs declined from 14,811 to 8,675, while the number of large- and medium-sized SHRs mushroomed from 1,801 to 5,659.

Furthermore, the conversion process extended to COEs, including the township and village enterprise sector, earlier celebrated for its competitive performance (Weitzman and Xu 1994). Li and Rozelle (2000) reported a fundamental privatization of rural industry, finding that more than 50 percent of local government-owned firms had transferred their shares, either partially or completely, to the private sector. This conversion process has been extensive, even among the largest, most successful COEs. During 1998–2001, the number of large- and medium-sized COEs declined by 35 percent (from 3,613 to 2,465).

In sum, we hold that the convergence of three factors—new entry and competition, strengthened managerial control, and accumulation of non-state assets—created the conditions for formal conversion during the late 1990s. Many local governments were anxious to rid themselves of loss-making enterprises (or to cash in on profitable ones before they turned sour), insider managers were poised to secure greater control over these enterprises, and asset structures were often already extensively diversified. Together, these three conditions were a strong motivation to complete the administrative formalities of shareholder conversion.

Literature Review and Comparative Perspective

This section reviews the growing body of research on enterprise conversion, drawing lessons from the surveys of enterprise restructuring and privatization literature, most of which had focused on the experiences of Eastern Europe and the Commonwealth of Independent States (CIS). The section also reviews literature that has centered specifically on restructuring China’s enterprises.

Privatization and Restructuring

Privatization literature includes three reviews of experiences from transition and developing economies: Megginson and Netter (2001), Djankov and Murrell (2002), and Birdsall and Nellis (2002). Megginson and Netter (2001) examine privatization’s effectiveness on the transition economies of Central and Eastern Europe (12 studies) and the CIS, including Russia and the former Soviet Republics (excluding the Baltic states) (six studies). They also review salient privatization episodes in OECD and nontransition

developing economies. Their key conclusions are that (1) privatization improves firm-level performance; (2) concentrated private ownership, foreign ownership, and majority outside ownership are associated with significantly greater improvement than the alternatives; and (3) privatization's effect on employment is ambiguous, since employment decreases for virtually all firms in transition economies.

Djankov and Murrell (2002), drawing on more than 100 studies of enterprise restructuring in transition economies, synthesize them into composite effectiveness rankings of various privatization strategies and outcomes. Like Megginson and Netter, Djankov and Murrell find that state ownership within traditional state firms is less effective than all other ownership types. Privatization to outsiders is associated with the largest restructuring gains; furthermore, privatization to workers has no effect in Eastern Europe but is detrimental in the CIS. Privatization to outsiders is associated with 50 percent more restructuring than privatization to insider managers and workers. Investment funds, foreigners, and other blockholders produce more than 10 times as much restructuring as diffuse individual ownership. Majority state ownership within partially privatized firms is surprisingly effective, producing more restructuring than enterprise insiders and non-blockholder outsiders. Djankov and Murrell conclude that various regions—particularly Eastern Europe and CIS economies—respond differently to similar privatization strategies. For example, privatization had no significant effect on enterprise performance in Eastern Europe, whereas the same form of privatization had substantial negative effects on firms in CIS economies. Also, opening to import competition had significant opposite effects on firm performance in Eastern Europe and the CIS. Such disparate effects across regions raise the possibility that aspects of the privatization experience elsewhere in the world may have limited application in China.

Birdsall and Nellis (2002) develop the idea that, by altering the distribution of ownership costs and benefits, privatization potentially affects a broader range of stakeholders than accounted for in the conventional privatization literature. They find that privatization programs have worsened the distribution of assets and income, at least in the short run. This tendency toward less equal distribution of assets is more evident in transition economies than in Latin America. Birdsall and Nellis also distinguish distributive effects across industries. They find that privatization's adverse distributional effects (e.g., for banks, oil companies, and other natural resource producers) have been less severe for utilities (such as electricity and telecommunications)—areas in which the poor have tended to benefit from greater access.

We accessed, as relevant to China, findings on

- relative effectiveness of outsider privatization,
- relatively poor performance of insider privatization,

- effectiveness of state ownership within partially privatized firms,
- distributional effects of asset privatization, and
- ambiguous employment effects.

Chinese Enterprise Restructuring

In recent years, research has been published on the determinants and effects of privatization and ownership conversion in China. Tian (2000), for example, uses a sample of 826 corporations listed on China's stock market to study the effects of state shareholding on corporate value. Tian discovers a U-shaped relationship between the proportion of government equity and corporate value with higher values for low and high shares of government equity than for values associated with intermediate shares of government ownership. He argues that the U-shape reflects the behavior of a government that is maximizing its overall interests. In the intermediate range, governments tend to exhibit a "grabbing hand," which induces lower corporate values. As the government's equity share increases, becoming sufficiently large, the government provides "helping hands," thereby increasing overall corporate value.

Li and Rozelle (2000), focusing on a sample of 168 township enterprises (88 of which have been privatized) in Jiangsu and Zhejiang provinces, find that "transitional costs apparently reduce private firm efficiency in the year that firms are being privatized." However, they find that two or more years after privatization, private firms produce 5 to 7 percent more output with the same inputs. They further surmise that, as privatized firms complete the transition to ownership and continue adapting to China's business environment, gains could further rise. An important insight is the presence of adjustment costs in the conversion process, which may result in a lag between conversion and realized benefits.

Dong, Bowles, and Ho (2002a), in their analysis of the determinants of employee share ownership in Jiangsu and Shandong provinces, show that privatization resulted in a higher concentration of share ownership in management and other board members. While regular employees owned shares in 16 of the 39 privatized enterprises in the sample, even in these enterprises, share distribution was highly skewed toward wealthier, local male residents in managerial positions. Dong, Bowles, and Ho find that the privatization process exhibits an important political dimension in which local leaders sell dominant ownership shares to managers, subject to the leaders' revenue objectives and managers' wealth constraints. The effect of this shareholding pattern is increased earnings inequality within the enterprise and, more broadly, in China's rural society.

In their report on share ownership's effects on employee attitudes (based on the survey used above), Dong, Bowles, and Ho (2002b) indicate that, in

general, employee shareholders have higher levels of job satisfaction, perceive greater degrees of participation in enterprise decision making, display stronger organizational commitment, and exhibit more positive attitudes toward the privatization process than nonshareholders in privatized firms.

Su and Jefferson (2003), investigating the determinants of ownership conversion in China's large- and medium-sized enterprises, find that the probability of ownership conversion increases with the firm's profitability, productivity, and intensity of competition faced by the firm. The probability of conversion falls with firm size, a result consistent with the government's policy of releasing smaller firms and retaining larger ones. These results indicate selection bias in the privatization process of Chinese SOEs. In evaluating the effects of ownership and ownership restructuring on firm performance, estimation procedures should recognize and account for this phenomenon.

Building on the findings of Su and Jefferson (2003) regarding competition's role in driving conversion, Li, Li, and Zhang (2000) conclude that competition requires local governments to improve the efficiency of SOEs and COEs under their jurisdiction. They also conclude that, because managers' efforts are not verifiable, local governments often respond by granting total or partial residual shares to managers. By concluding that "intense competition stimulates the rise of a private property system," they postulate a certain inevitable quality to a process in which reform and competition lead to privatization, with an emphasis on insider privatization (Li, Li, and Zhang 2000, 269). These findings are consistent with our heuristic model of Chinese enterprise conversion, in which entry and competition, as well as reform of managerial control rights, served as antecedents to the conversion movement that began in the late 1990s.

Large- and Medium-Sized Enterprises: The Dataset

The statistical system China uses to track its industrial enterprises has three concentric circles, or populations, of enterprises. The outer circle includes all enterprises in the industrial system. According to table 11.1, in 1998, this broad measure included 7.9 million enterprises. For this inclusive enterprise population, China's statistical authorities report only skeletal information—generally not more than the total number and gross industrial output.

The middle circle, consisting of less than 5 percent of China's total industrial enterprise population, includes enterprises reporting more than 5 million yuan (approximately \$600,000) of annual sales; all firms classified as SOEs are included, regardless of annual sales. For these enterprises, the statistical authorities collect and report a broader set of measures, including basic ones of financial performance, such as profits and losses.

Finally, the inner circle consists of the country's some 22,000 large- and medium-sized enterprises. NBS data indicate that, in 2001, these enterprises accounted for approximately 62 percent of total sales of enterprises with annual sales exceeding 5 million yuan. These firms and the detailed annual census data that the NBS collected directly from these firms constituted the database for this study.

These large- and medium-sized enterprises, whose performance the NBS carefully tracks, are China's most successful companies—those that have grown and sustained their status at the pinnacle of the country's industrial enterprise sector—and many of its most troubled enterprises. As the focus of decades of central planning and administered allocations of subsidized capital, skilled labor, and raw materials, some of these large- and medium-sized SOEs continue to impede China's transition to an advanced market economy.

During 1995–2001, the period covered by this study's panel of data, the NBS changed its system of ownership classification. For the purpose of comparing categories of ownership and tracking ownership reform between 1995 and 2001, we use the concordance shown in appendix 11A, which aligns the 1999 system of ownership classification with the preexisting one. This aggregation of 23 detailed categories into 7 broader ones—state; collective; Hong Kong, Macao, and Taiwan; foreign; shareholding; private; and other domestic—closely tracks the classification system currently used in the *China Statistical Yearbook*.⁵ Using this concordance, we have compiled a description of the changing ownership profile of China's large- and medium-sized enterprise sector (table 11.2).

Performance of Firms with Established Ownership Classifications

As shown in table 11.1, China's enterprise system currently combines a wide variety of ownership types. One approach to evaluating the implications of ownership change is to compare the performance of firms already established in an ownership classification. To determine why ownership matters in China's economy, we first compared the performance of firms that reported different ownership classifications. They included eight measures of performance: labor productivity, capital productivity, profitability, employment, wages, taxes paid, new product sales, and R&D intensity. The profitability measure represented the difference between sales revenue and the production costs of sold output. Thus, it excluded certain taxes,

5. Exceptions are that the concordance (1) excludes individually owned enterprises (none of which qualify as large- or medium-sized enterprises), (2) distinguishes between FORs and HKT enterprises, and (3) separates private ownership and other type of ownership. See *China Statistical Yearbook* (NBS 2000, 407).

Table 11.2 China: LME ownership distribution, 1994 and 2001

Ownership category	1994		2001	
	Number	Percent	Number	Percent
State	15,533	67.9	8,675	37.9
Collective	4,068	17.8	2,465	10.8
Hong Kong, Macao and Taiwan	967	4.2	2,271	9.9
Foreign	1,041	4.6	2,675	11.7
Shareholding	961	4.2	5,659	24.7
Private	7	0.0	984	4.3
Other domestic	293	1.3	149	0.7
Total	22,870	100.0	22,878	100.0

LME = large and medium-sized enterprise

Source: NBS (1995, 2001).

pension payments, welfare subsidies, and other costs not directly associated with production.

To identify the “pure” ownership effect, we held constant differences in the composition of asset ownership across enterprises. This approach allowed for the fact that some SOEs contain asset structures that are mostly nonstate owned, whereas significant numbers of nonstate-owned enterprises retain a majority of state-owned assets. By controlling for differences in asset ownership, we could distinguish between ownership classification and asset composition effects (table 11.3).

Ownership Classification Effect

Table 11.3 (rows COE, FOR, GAT, OTH, PRI, and SHR) demonstrates that, since SOEs are the reference intercept in the regression and because most of the estimates of the ownership classification dummies are highly statistically significant, one can infer that ownership matters for performance. The results show that SOE productivity—both labor and capital—is significantly lower than that of the other ownership types. However, with the exception of FORs and SHRs, the ratio of sales profit to sales revenue is higher for SOEs. While lower wages in SOEs may explain a tendency toward higher SOE sales profits, table 11.3 also shows that employment and taxes are frequently higher in SOEs than in other ownership classifications. The tendency for SOEs to operate in less competitive industries, such as tobacco and petroleum, may also explain their relative profit advantage, although a portion of this effect is captured by including regression dummies at the two-digit industry level.

Asset Composition Effect

In table 11.3, rows STATE and FOR/HKT control for the effect of asset composition—share of state-owned assets and combined share of FOR and

Table 11.3 China: Comparison of ownership classification and asset composition

Variable	VA/L	VA/K	Profit/ sales	Employment	Wages (average)	Taxes/ sales	New product sales/total sales	R&D expenditure/ sales
Constant	1.086 (44.507)	1.086 (44.508)	-2.295 (130.261)	7.697 (402.711)	1.700 (130.869)	-5.214 (203.023)	-11.257 (70.368)	-18.015 (133.412)
K/L	0.580 (164.763)	-0.420 (119.419)	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
COE	0.308 (24.005)	0.308 (24.005)	-0.054 (4.983)	-0.335 (28.698)	-0.175 (22.016)	0.110 (7.030)	-1.655 (16.940)	-0.994 (12.046)
FOR	0.563 (26.914)	0.563 (26.914)	0.118 (6.741)	-1.013 (53.505)	0.507 (39.395)	-0.599 (23.211)	-3.958 (24.988)	-2.677 (20.018)
GAT	0.342 (16.404)	0.342 (16.404)	-0.038 (2.161)	-0.902 (47.689)	0.206 (16.025)	-0.659 (25.333)	-3.333 (21.047)	-1.576 (11.789)
OTH	0.315 (9.398)	0.315 (9.398)	-0.065 (2.297)	-0.422 (13.821)	0.146 (7.015)	-0.113 (2.773)	-0.838 (3.282)	-1.240 (5.749)
PRI	0.509 (19.609)	0.509 (19.609)	-0.108 (4.942)	-0.494 (20.919)	-0.129 (8.064)	0.072 (2.268)	-1.901 (9.630)	-1.569 (9.413)
SHR	0.428 (40.585)	0.428 (40.585)	0.118 (13.31)	0.017 (1.740)	0.024 (3.662)	0.261 (20.438)	0.401 (4.986)	0.217 (3.203)

STATE	-0.046 (31.394)	-0.046 (31.394)	0.004 (3.257)	0.041 (30.673)	-0.028 (30.674)	0.009 (4.912)	0.044 (3.941)	0.080 (8.461)
Asset share								
FOR/HKT	0.062 (23.786)	0.062 (23.786)	-0.008 (-3.571)	0.062 (26.563)	0.041 (25.782)	-0.05 (-15.71)	0.193 (9.793)	0.022 (1.304)
Asset share								
IND	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Time	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Adjusted R-squared (observations)	0.392 (96,908)	0.298 (96,908)	0.106 (87,820)	0.261 (96,908)	0.268 (96,908)	0.240 (92,718)	0.179 (96,908)	0.099 (96,908)

COE = collective-owned enterprise

FOR = foreign-owned enterprise

FOR/HKT = foreign sources including Hong Kong, Macao, and Taiwan

GAT = Hong Kong, Macao, or Taiwan owned enterprise

IND = industry dummy

K/L = net value of fixed assets/employment

n.a. = not applicable

OTH = other

PRI = private enterprise

R&D = research and development

SHR = shareholding enterprises

STATE = state-owned assets

VA/K = value added/net value of fixed assets

VA/L = value added/total employment

HKT-owned assets—on firm performance.⁶ The results showed that STATE negatively affects labor and capital productivity and wages; conversely, STATE is positively associated with profitability, employment, new products, and R&D expenditures. The FOR/HKT asset share exhibits a pattern of performance outcomes, which, with the exception of employment, new product sales, and R&D intensity, is the inverse of STATE asset shares. Enterprises rich in FOR/HKT assets exhibit high levels of labor and capital productivity and wages.

These results demonstrated the importance of distinguishing between the effects of a change in ownership classification and a change in asset composition on enterprise performance. However, this analysis may be of limited predictive value regarding the effect of change from state ownership to shareholding status on a given firm. Ambiguity intrudes for the following reasons:

- **Selection bias.** The differential quality of converted and unconverted firms may reflect selection bias—that is, the SOEs chosen for conversion may not be typical of the existing population. If converted SOEs tend to be well-above-average performers, then, following a period after the conversion, any measured quality advantage of the converted SOEs may reflect selection bias rather than the salutary consequences of conversion. In sum, it may be that conversion does not improve performance, but that good performers become converted.
- **Adjustment costs.** Following conversion, time may be required to adjust to new governance arrangements and achieve efficiency improvements associated with changes in the firm's labor force, asset composition, and product mix. In their investigation of privatization of rural collectives, Li and Rozelle (2000) find evidence of transition costs. Gains ensuing from privatization may appear only one to two years after conversion.

This study formally tests for selection bias, but can only speculate on the importance of transition costs.

Sample of Converted Enterprises

Using the balanced samples of converted and unconverted SOEs and COEs, this study tested whether the firms selected for conversion are more or less

6. We constructed two measures of asset shares: those for state-owned assets (STATE) and those originating from foreign sources, including Hong Kong, Macao, and Taiwan (FOR/HKT). The effect of OTH, the omitted third assets category, was represented by the constant in each of the equations. The coefficients on STATE and FOR/HKT should therefore be interpreted in relation to the magnitudes shown in the constants.

Table 11.4a China: Converted SOEs, 1996–2001

Old	New ^a	1996	1997	1998	1999	2000	2001	Total
Total population of SOE conversions								
SOE	DSOE	12,909	13,268	11,326	9,824	8,711	6,899	62,937
SOE	DCOE	16	69	145	64	52	52	398
SOE	DSHR	87	342	546	319	517	454	2,265
SOE	DPRI	1	10	31	14	30	36	122
SOE	DFOR	11	15	21	5	5	6	63
SOE	DGAT	3	13	16	14	10	14	70
SOE	DOTH	5	28	40	23	12	10	118
Total		13,032	13,745	12,125	10,263	9,337	7,471	3,036
Conversions for which data are continuously available during 1995–2001								
SOE	DSOE	5,343	5,235	4,964	4,887	4,697	4,425	29,551
SOE	DCOE	5	17	66	26	18	30	162
SOE	DSHR	31	110	210	110	204	236	901
SOE	DPRI	0	2	8	5	10	19	44
SOE	DFOR	2	4	5	3	2	2	18
SOE	DGAT	0	3	3	6	1	4	17
SOE	DOTH	2	10	18	4	5	5	44
Total		5,383	5,381	5,274	5,041	4,937	4,721	1,186
Conversions for which data are continuously available during 1995–2001, have only one conversion, and data are plausible								
SOE	SOE	3,484	3,413	3,225	3,170	3,107	0	13,292 ^b
SOE	SHR	13	48	128	69	146	0	258

COE = collective-owned enterprise

FOR = foreign-owned enterprise

GAT = Hong Kong, Macao, or Taiwan owned enterprise

OTH = other

PRI = private enterprise

SHR = shareholding enterprise

SOE = state-owned enterprise

a. Entries in this column represent the status in year t relative to $t - 1$.

b. Total for 1996–99.

Source: National Bureau of Statistics large- and medium-size industrial enterprise dataset, 1995–2001.

likely in the year before conversion, $t - 1$, to have exhibited a high or low measure of any of the eight performance measures.

Before conducting this selection bias analysis, we constructed samples of both converted and unconverted enterprises to establish a control. To be included in the sample, a firm had to have reported data for the year before its conversion ($t - 1$) continuously through 2001. Within the sample, the included conversion years were $t = 1996, 1997, 1998,$ and 1999 . Because the proximity of 2000 to 2001 was likely to diminish the realized effect of conversion, the study excluded firms converted in 2000. It also eliminated enterprises that reported multiple conversions (i.e., those that converted from SOE or COE to SHR and then converted to another ownership type). Finally,

Table 11.4b China: Converted COEs, 1996–2001

Old	New	1996	1997	1998	1999	2000	2001	Total
Total population of COE conversions								
COE	DSOE	37	45	56	27	12	22	199
COE	DCOE	3,109	3,526	2,566	2,698	2,539	1,716	16,154
COE	DSHR	35	124	211	157	187	256	970
COE	DPRV	5	8	35	30	73	65	216
COE	DFOR	8	10	18	10	10	11	67
COE	DGAT	6	9	41	15	14	12	97
COE	DOTH	11	12	24	8	4	6	65
Total		3,211	3,734	2,951	2,945	2,839	2,088	1,614
Conversions for which data are continuously available during 1995–2001								
COE	DSOE	9	14	21	9	2	12	67
COE	DCOE	1,053	1,008	924	968	938	834	5,725
COE	DSHR	12	44	64	42	49	91	302
COE	DPRV	1	2	7	9	20	26	65
COE	DFOR	3	2	5	4	2	4	20
COE	DGAT	3	1	14	7	3	2	30
COE	DOTH	2	5	7	6	1	1	22
Total		1,083	1,076	1,042	1,045	1,015	970	506
Conversions for which data are continuously available during 1995–2001 have only one conversion, and data are plausible								
COE	COE	1,053	1,002	849	787	723	0	4,414
COE	SHR	3	20	47	23	0	0	93

Source: National Bureau of Statistics large- and medium-size industrial enterprise dataset, 1995–2001.

the study eliminated firms that reported implausible figures for key variables, such as zero or negative sales or fixed capital stock.⁷

Tables 11.4a and 11.4b profile the conversions of SOEs and COEs during 1996–2001. As table 11.4a shows, 3,036 SOEs were converted to nonstate enterprises during the period. Of these, 2,265 or 75 percent entailed conversions to SHRs. The lower panel identifies the number of enterprises that reported a single conversion, for which key data were continuously available from $t - 1$ to 2001, and for which the data observations were plausible. Within the sample, 404 enterprises satisfied these criteria. Since the study did not include conversions reported in the year 2000, the effective sample size for SOE conversions was 258.⁸ The 13,292 unconverted SOEs that

7. Appendix 11A specifies three types of SOEs, of which this study sample included two: SOEs and wholly SOEs; it did not include jointly operated SOEs, which involve hybrid ownership and already include certain SHR attributes.

8. Many converted enterprises changed their identification (ID) in the conversion process and therefore could not be tracked before and after conversion. Efforts to match pre and postconverted enterprises indicated that conversions involving changes in industry or size classifications or locations increased the likelihood of issuing a new ID. Thus, this study sample, while a fraction of the total number of converted enterprises, tend to control for industry, size, and location so that the comparative statistical analysis focused on the independent effect of conversion.

existed in 1995 (i.e., thereby constituting a total of 13,292 observations during the sample period) constituted the part of the sample that allowed one to identify the nature of selection bias and the independent effect of conversion. For the collectives, table 11.4b shows that, among the 1,614 reported conversions, 970 were from COEs to SHRs. Of these, 93 enterprises satisfied the criteria for a single conversion, continuous data, and plausible observations. The unconverted subset consisted of 4,414 COEs.

Applying logit analysis to the sample described above, we estimated the probability of firms with certain performance characteristics being converted. The major findings showed that, relative to the unconverted SOEs, the firms selected for conversion exhibit high levels of both labor and capital productivity and profitability; they also exhibit relatively low levels of employment and relatively high tax burdens (table 11.5). The COEs selected for conversion were distinguished by relatively high R&D intensity and marginally greater profitability.

Finally, the study examined the regional bias of the conversion process. Because we found that more successful firms tended to enjoy a higher probability of conversion, it was not surprising that, relative to other regions, SOEs located in China's eastern and southern provinces had a larger probability of conversion. COEs located in the eastern provinces also exhibited a higher probability of conversion; however, those in the southern provinces were among the least likely to be converted. These findings revealed the phenomenon of selection bias—that is, the tendency for SOEs with certain characteristics to participate in the conversion process. As a result of selection bias, researchers may have difficulty determining whether certain characteristics that converted enterprises exhibit (e.g., greater productivity and profitability) existed before conversion or resulted from it. The study method, described below, attempts to control for such bias.

Effects of Conversion on Enterprise Performance: Research Method

To analyze the effects of conversion on firm performance, we first identified the relevant set of performance variables, which included eight measures: labor productivity, capital productivity, profitability, employment, wages, taxes paid, new product sales, and R&D intensity. For each measure, we compared 2001 performance levels for converted, versus unconverted, enterprises, controlling for performance levels in the year before conversion ($t - 1$) (to control for selection bias).

Second, we formulated an equation used to estimate the individual contributions of six factors to each of the eight performance measures. Our formal estimation equation was:

Table 11.5 China: Characteristics of converted enterprises in $t-1$
(includes conversions for 1996–2000)

Characteristic	Conversion type	
	SOE-SHR	COE-SHR
$(VA/L)_{t-1}$	0.004 (2.916)	0.005 (1.230)
$(VA/K)_{t-1}$	0.006 (4.115)	0.003 (0.781)
$(Profit/sales)_{t-1}$	0.005 (2.764)	0.008 (1.501)
$(Employment)_{t-1}$	-0.003 (1.852)	0.004 (0.754)
$Wage_{t-1}$	-0.001 (0.228)	0.008 (1.215)
$(Taxes/sales)_{t-1}$	0.007 (5.945)	0.006 (1.633)
$(NP/sales)_{t-1}$	-0.000 (0.872)	0.001 (2.259)
$(RDE/sales)_{t-1}$	-0.000 (0.591)	0.001 (1.096)
IND	Yes	Yes
Region	Yes	Yes
Year	Yes	Yes

COE = collective-owned enterprise
IND = industry dummy
K = net value of fixed assets
L = employment
NP = new products
R&D = research and development
RDE = R&D spending
SHR = shareholding enterprise
SOE = state-owned enterprise
VA = value added

Note: Estimation results for each variable are drawn from regressions that include the single performance measure with control dummies for industry, region, and year.

$$\begin{aligned}
 \ln Z_{j,01} = & \alpha_0 + \alpha_1 SHR_i + \alpha_2 \Delta \ln ST_SH_{t-1to01} \\
 & + \alpha_3 (\Delta \ln ST_SH_{t-1to01}) * DSHR \\
 & + \alpha_4 DSTA_LP_{t-1to01} + \alpha_5 \ln Z_{j,t-1} + \varepsilon_{1j}
 \end{aligned} \tag{11.1}$$

where $Z_{j,01}$ included the set of eight performance measures (i.e., $j = 1 \dots 8$).

The six factors that determined $Z_{j,01}$ were

- independent effect of conversion, holding the firm's asset structure fixed (i.e., $\alpha_1 SHR_t$);
- reduced share of state-owned assets, controlling for the firm's formal ownership classification (i.e., $\alpha_2 \Delta \ln ST_SH_{t-1 to 01}$);
- differential effect of reductions on share of state-owned assets in converted, versus unconverted, enterprises (i.e., $\alpha_3 [\Delta \ln ST_SH_{t-1 to 01}] * DSHR$) (if $\alpha_3 < 0$, then a given reduction in the state-owned asset share of a converted enterprise would have a larger effect on the relevant performance measure than a similar reduction in the state-owned asset share for an unconverted enterprise);
- increased share of state-owned assets (i.e., $\alpha_4 DSTA_LP_{t-1 to 01}$) (this study used a [0,1] dummy to capture its effect following conversion);
- tendency for lagging firms to revert to the mean (i.e., $\alpha_5 \ln Z_{it-1}$); and
- unexplained part captured by the residual or error term (i.e., ϵ_{it6}).

Estimates of Conversion Equations

The study estimated equation (11.1), using the six factors described above. The results for SOEs and COEs are shown in tables 11.6a and 11.6b, respectively. The first step was to review the regression results for the SOE sample. In addition to the results shown in table 11.6a, a summary list of outcomes is grouped in the left-hand column of table 11.7.

Direct Effect of Conversion

Absent changes in asset structure, the effects of converting SOEs into shareholding enterprises included increased capital productivity, employment, new product sales, R&D intensity, and reduced wages and profitability. In terms of resulting growth or slower decline in employment, it should be noted that the conversions occurred during a period when state-sector, worker furloughs (*xiaogang*) were widespread. Moreover, as table 11.5 shows, the enterprises selected for conversion exhibited relatively low levels of employment before conversion. It is possible that efforts to obtain public authorities' approval to convert SOEs into SHRs may have included negotiations and agreements with workers—key stakeholders in the conversion process—to avoid or limit layoffs. The additional finding that conversion alone tended to be associated with downward wage adjustments suggests that the *quid pro quo* for retaining workers was wage reduction or slower wage growth. Finally, reduction in profit associated with conversions may reflect what Li and Rozelle (2000) characterize as “transitional costs.” They may also reflect the “grabbing hand” of the government (Tian 2000) or other stakeholders during the conversion process.

Table 11.6a China: All SOE conversions, 1996–99, ($\ln Z_{2001}$)

Independent variable (Z_{2001})	V/L	V/A/K	Profit/sales	Employment	Wages (average)	Taxes/sales	New products/sales	R&D expenditure/sales
Constant	1.512 (53.863)	-0.394 (20.430)	-1.192 (46.845)	0.094 (3.110)	0.927 (46.760)	-1.594 (37.472)	-7.639 (44.201)	-9.271 (43.165)
DSHR dummy	0.020 (0.344)	0.146 (2.224)	-0.124 (2.174)	0.073 (2.274)	-0.095 (2.456)	-0.050 (0.709)	1.476 (2.432)	1.262 (2.155)
Δ in share state assets, $t-1$ to 01	-0.039 (7.179)	-0.023 (3.923)	-0.003 (0.487)	0.011 (3.912)	-0.035 (10.070)	0.015 (2.319)	-0.200 (4.125)	-0.099 (2.117)
Δ in share state assets, $t-1$ to 01 *SHR	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	0.603 (2.092)	0.454 (1.634)
Dummy for increase in share state asset	0.049 (1.632)	0.001 (0.305)	-0.051 (1.741)	-0.010 (0.629)	-0.002 (0.093)	-0.033 (0.935)	0.133 (0.502)	0.194 (0.762)
$\ln Z_{t-1}$	0.497 (54.591)	0.579 (57.697)	0.500 (43.423)	0.944 (234.471)	0.637 (65.329)	0.632 (71.601)	0.506 (62.506)	0.308 (31.518)
1997	-0.033 (1.488)	-0.164 (6.716)	0.040 (1.851)	0.008 (0.679)	-0.039 (2.732)	0.029 (1.103)	0.174 (0.885)	-0.520 (2.737)
1998	-0.058 (2.584)	-0.238 (9.582)	0.060 (2.709)	0.010 (0.800)	-0.048 (3.312)	0.042 (1.568)	0.483 (2.431)	-0.557 (2.894)
1999	-0.065 (2.877)	-0.221 (8.747)	0.125 (5.607)	0.078 (6.418)	-0.065 (4.421)	0.026 (0.980)	0.374 (1.870)	-0.667 (3.440)
Adjusted R-sq (observations)	0.226 (10,758)	0.263 (10,758)	0.171 (9,232)	0.837 (10,758)	0.298 (10,722)	0.329 (10,497)	0.273 (10,758)	0.087 (10,758)

n.a. = not applicable

Table 11.6b China: All COE conversions, 1996–99 ($\ln Z_{2001}$)

Independent variable (Z_{2001})	VA/L	VA/K	Profit/sales	Employment	Wages (average)	Taxes/sales	New products/sales	R&D expenditure/RDE/sales
Constant	1.214 (17.222)	-0.092 (2.586)	-1.152 (20.224)	-0.043 (0.475)	1.053 (28.902)	-2.490 (24.697)	-8.983 (23.453)	-11.492 (25.574)
SHR dummy	0.130 (1.554)	0.266 (2.809)	0.136 (1.788)	0.152 (3.071)	0.044 (0.935)	0.098 (0.931)	2.084 (2.645)	0.083 (0.122)
Increase in share state assets, $t-1$ to 01	-0.014 (0.859)	0.001 (0.052)	-0.024 (1.550)	0.004 (0.427)	0.009 (1.013)	0.003 (0.155)	0.235 (1.553)	-0.101 (0.775)
Dummy for increase in share state asset	0.087 (0.861)	0.047 (0.411)	0.143 (1.443)	-0.055 (0.911)	-0.030 (0.522)	0.216 (1.638)	-0.458 (0.481)	0.469 (0.571)
$\ln Z_{t-1}$	0.688 (35.679)	0.754 (33.587)	0.607 (24.625)	0.967 (71.573)	0.555 (30.434)	0.445 (21.444)	0.397 (20.672)	0.268 (12.226)
1998	0.005 (0.127)	-0.025 (0.517)	0.014 (0.348)	-0.009 (0.363)	-0.037 (1.521)	0.030 (0.548)	0.044 (0.110)	-0.112 (0.322)
1999	0.017 (0.389)	0.018 (0.369)	0.122 (3.013)	0.058 (2.277)	-0.021 (0.850)	0.012 (0.217)	0.129 (0.321)	0.118 (0.337)
Adjusted R ² (observations)	0.369 (2,184)	0.346 (2,184)	0.235 (2,003)	0.705 (2,184)	0.303 (2,168)	0.180 (2,121)	0.169 (2,184)	0.065 (2,184)

Source:

Table 11.7 China: Summary of selection-bias conversion results, ranked by statistical significance (all are statistically significant at ≥ 90 percent level)

Variable change	Sign	SOEs	COEs
Selection bias (baseline performance relative to unconverted firms) (see tables 11.6a and 11.6b) ^a	+	VA/L*	n.a.
		VA/K*	
		Profit/sales*	
Direct conversion effect (assuming no change in asset structure)	-	Tax/sales*	n.a.
		Employment***	
	+	VA/L*	VA/K*
		VA/K*	Profit/sales***
		Employment**	Employment*
Effect of a decrease in state-owned asset share	-	RDE/sales**	n.a.
		NP/sales**	
	+	Average wage**	n.a.
		Profit/sales*	
		VA/L*	
Dummy for an increase in state-owned asset share	-	VA/K*	n.a.
		Wages*	
	+	NP/sales ^a	n.a.
		RDE/sales ^a	
		Employment*	
-	Taxes/sales**	n.a.	
	Profit/sales***		

COE = collective-owned enterprise
n.a. = statistically significant at less than the 10 percent level
NP = new products
RDE = research and development spending
SOE = state-owned enterprise
VA/K = value added/net value of fixed assets
VA/L = value added/employment
* = statistically significant at the 1 percent level
** = statistically significant at the 5 percent level
*** = statistically significant at the 10 percent level
a. Effect consists of two estimated coefficients.

Effect of Reduced State Asset Share

Reducing the state’s asset ownership share following conversion—associated significantly with rising labor and capital productivity—accounts for some of the most robust effects of the conversion process. Paradoxically, notwithstanding the rise in labor and capital productivity, profitability is relatively unaffected by declining state asset shares. The elasticities of gains in labor productivity growth and wage growth, with respect to decline in state asset shares, are of similar magnitude and may therefore cancel out each other’s effect. However, the gain in capital productivity, coupled with a reduced tax burden, might be expected to translate into higher profitability. Reductions in the share of nonstate assets are also associated with a rise in both R&D intensity and new product sales, which may auger still greater productivity

advantages for the converted SHRs. Increased R&D spending may help to explain the apparent decline in profitability. Comparing the induced and direct effects of conversion indicates that certain effects operate in opposite directions (e.g., employment and wages), whereas others (e.g., capital productivity, new product sales, and R&D intensity) are directly enhanced by conversion and associated reductions in state asset shares.

Reduced State Asset Shares for Converted and Unconverted Enterprises: Differential Effect

For all but two performance measures, the study samples found that the effect of reducing state asset shares exhibited no distinguishable differences between converted and unconverted enterprises. Where the study found no significant effect, the coefficient was restricted to $\alpha_3 = 0$. For the sample of converted SOEs, equivalent reductions in state asset shares had comparatively smaller effects on new product sales and R&D intensity. We accounted for these differences in calculating the total conversion effects.

Effect of Increased State Asset Share

Some enterprises experienced increases in the share of state-owned assets over the period $t - 1$ to 2001.⁹ We found that such increases generally had no effect. While larger state shares were associated with higher labor productivity growth and lower profitability growth, the statistical significance of these associations was not robust.

Catch Up: Reversion to the Mean

The coefficient on the lagged performance measure (i.e., $\alpha_5 \ln Z_{it-1}$) identifies the degree of catch up or convergence—the extent to which firms with unusually high or low initial performance levels tended, by 2001, to revert to the mean. For example, the profitability equation (for which $\alpha_5 = 0.500$) indicates substantial catch up—that is, firms with high profitability in $t - 1$ tended to sustain only half of their initial advantage, after controlling for conversion and asset mix. By comparison, the employment equation (for which $\alpha_5 = 0.944$) indicates little change in relative employment levels over the period $t - 1$ to 2001. The catch-up phenomenon may overturn the anticipated effects of conversion on actual performance measures. In particular, since selection bias is associated with higher levels of productivity and profitability, the catch-up phenomenon may diminish the effect of conversion on these measures.

9. This study sample of converted SOEs included only three such cases.

Table 11.6b reports the estimation results for the sample of COEs, whose results table 11.7 summarizes.

Direct Effects of Conversion

Converting COEs to SHRs was found to accelerate capital productivity growth and weakly improve profitability. Similar to converted SOEs, one consequence of conversion was the tendency to retain or add employment relative to the unconverted sample. Again, this outcome may have reflected the efforts of workers and local leaders to use conversion as an opportunity to stem layoffs or increase jobs. Relative to unconverted COEs, new product sales rose. Other performance measures were not significantly affected by the independent effect of conversion.

Effect of Reduced State Asset Share

For COEs, reducing the state's asset share had no highly significant effect on firm performance. This outcome is not surprising, given the state's relatively low share of ownership in COEs. As table 11.9 shows, for unconverted firms, the state's asset share fell from 7.3 to 3.2 percent; for converted firms, the share declined from 9.1 to 2.1 percent. The study found no evidence that reductions in the state's asset share exerted differential effects on converted and unconverted COEs.

Effect of Increased State Asset Share

An increase in the share of state-owned assets subsequent to conversion exhibited no effects on any of the eight performance measures.

Catch Up: Reversion to the Mean

As with SOEs, the study found a general pattern of catch up or reversion to the mean, conditional on controlling for the conversion variables. With the exception of labor, for which the study found little tendency for catch up, most variables exhibited a substantial tendency to revert to the mean.

Effect of Conversion on Asset Structure

For SOEs, the study found that reductions in state asset shares substantially affected many of the performance measures examined. It may be that formally converting an SOE to an SHR does not affect the asset composition of the firm; alternatively, conversion might substantially enhance the firm's abil-

Table 11.8 China: Change in state asset share ($\Delta \ln ST_SH_{t-1 to 01}$) in converted enterprises relative to unconverted ones

Variable	SOE-SHR conversions	COE-SHR conversions
Constant	-0.017 (15.579)	-0.075 (2.255)
DSHR	-0.078 (9.209)	-0.052 (0.317)
Adjusted R ² (observations)	0.008 (3,851)	0.000 (961)

COE = collective-owned enterprise
DSHR = enterprise that has been converted to shareholder ownership status
SHR = shareholding enterprise
SOE = state-owned enterprise

ity to reduce the state-owned share of its assets. This study used the following equation to test the effect of conversion on the firm's asset composition.

$$\Delta \ln ST_SH_{t-1 to 01} = \beta_0 + \beta_1 DSHR_t + \varepsilon_2 \quad (11.2)$$

If in equation 11.2 $\beta_1 > 0$, one could conclude that conversion speeds the reduction in the state's asset share. Table 11.8 shows that the estimate of β_1 is highly statistically significant; converted SOEs are significantly more able than unconverted SOEs to reduce their share of state-owned assets. Consistent with this result, table 11.9 shows that, for converted SOEs, the ratio of state-owned assets falls to nearly one-half of the ratio before conversion, whereas for unconverted enterprises, the decline is closer to 20 percent. The estimated coefficients for the conversion dummy (DSHR) indicate that, compared with SOEs, COEs do not enjoy an advantage relative to their unconverted counterparts in achieving reductions in state-owned asset shares (table 11.8).

Reducing State Share of Assets

Do reductions in the state's share of asset ownership result from either the accumulation of new nonstate investment or conversion of state-owned assets to nonstate ownership? In converted enterprises, the quantity of state-owned assets rises from an average of 38.6 billion yuan in $t - 1$ to 43.1 billion yuan in 2001. The concurrent increase in nonstate assets from 47.6 to 98.6 billion yuan accounts for the decline in state-owned asset ownership in 2001 to nearly one-half (i.e., 0.520) of their share in $t - 1$.

Table 11.9 China: Reduction in state asset share, $t-1$ to 2001

$\Delta \ln ST_SH_{t-1 \text{ to } 01}$	Unconverted firms			Firms converted to SHRs		
	$t-1$	2001	Ratio 2001/ $t-1$	$t-1$	2001	Ratio 2001/ $t-1$
SOEs	91.6	72.5	0.792	78.1	40.6	0.520
COEs	7.3	3.2	0.438	9.1	2.1	0.231

COE = collective-owned enterprise

SHR = shareholding enterprise

SOE = state-owned enterprise

These findings show that conversion results in a substantially enhanced ability to attract nonstate investment. The associated finding that conversion tends not to reduce the volume of existing state-owned assets carries two implications: (1) conversion does not result in the transfer—either through sale or give away—of state-owned assets to nonstate interests, and (2) conversion is not associated with breakup of the SOE into parts with high-performing state assets captured by the converted enterprise and chronic nonperforming assets and debt obligations left behind as wards of the state and banking system. Examples of these arrangements—involving both stripping and creaming the best of the state-owned assets—can be found; however, they do not characterize the firms in this sample.

Endogeneity

Before summarizing these regression results, we address the issue of potential endogeneity bias in the estimates of equation 11.1. Of specific concern is the case in which nonstate investors take into account the rate of change in one performance measure to determine where to invest. Appendix 11B explains this study's approach to correcting for potential endogeneity bias; with two exceptions, the pattern of estimates for the contemporaneous and lagged values of the dependent variable, $\Delta \ln ST_SH_{t-1 \text{ to } 01}$, are similar.¹⁰

Estimating Total Effect of Conversion

To estimate the total effect of conversion, the study evaluated the combined effects of two avenues of effect associated with the conversion process: (1) the direct effect (α_1) and (2) the effect of reducing the share of state-owned assets resulting from conversion [$\alpha_3(\Delta \ln ST_SH_{t-1 \text{ to } 01})$]. Because reducing state

10. This set of results is not reported; results can be made available, upon request to the authors.

asset shares affects performance of the innovation variables—new products and R&D spending—differently for converted and unconverted firms, this study incorporated the differences for these two performance measures into the calculations $[\alpha_3(\Delta \ln ST_SH_{t-1 \text{ to } 01}) * DSHR]$. We estimated and reported the effect of an increase in share of state-owned assets because only a few firms exhibited such increases (tables 11.6a and 11.6b). However, we omitted this factor from our calculations. By computing growth rates in the performance measures from $t - 1$ to 2001, which the study presented as average annual rates, selection bias did not affect estimates.

The study first focused on the state-owned sector. Table 11.10 shows three sets of growth rates. Two rates compare overall rates of growth of the performance measures for converted and unconverted enterprises, while the third uses the above method to compute only that portion of each growth rate attributable to conversion. These are to be compared with zero (0), the comparable implicit growth rates for the unconverted SOEs. This third set of rates shows that conversion has systematic, extensive effects on the newly created SHRs. Resulting growth of labor and capital productivity, employment, and taxes in converted enterprises exceeds that of counterpart unconverted enterprises, controlling for the catch-up factor. Conversion most dramatically affects growth rates of innovation expenditure and activity (i.e., R&D spending and new product sales). Simultaneously, in comparison with the counterpart unconverted SOEs, the study observed negative profit and wage growth. Where directions of the effect of direct and induced channels differed (e.g., employment and wages), the direct effect dominated, at least within the sample period. For employment, the direct effect of increased employment associated with the conversion event dominated the attrition of workers resulting from additional nonstate investment. Likewise, the dampening direct effect of conversion on wage growth persisted, even as converted firms succeeded in attracting new nonstate investment, which worked to increase the pace of wage growth.

The lower half of table 11.10 shows this study's estimates of the total effect of conversion on performance for the sample of converted collectives. For each performance measure in which no relevant estimated coefficients (shown in table 11.6b) were significant, at least at the 10 percent level, we assumed that the relevant figure displayed in table 11.10 was not statistically significant and therefore ignored it. Study results showed that conversion increased the growth rates of capital productivity, profitability, employment, and new product sales (table 11.10).

Conclusions and Implications for Distribution and Governance

Building on the empirical results presented in this chapter, one can speculate on certain governance and control, efficiency, and distributional

Table 11.10 China: Comparison of actual and estimated growth rates

Enterprise growth rate	VA/L	VA/K	Profit/sales	Employment	Wages (average)	Taxes/sales	New product/sales	R&D expenditure/sales
SOE								
Actual growth, $t-1$ to 2001								
Converted	0.026	-0.028	-0.092	-0.054	0.047	-0.036	0.021	0.377
Unconverted	0.042	-0.025	-0.050	-0.067	0.058	0.007	-0.264	0.202
Estimated growth (resulting from conversion)	0.012 ^a	0.041 ^a	-0.032 ^a	0.020 ^a	-0.020 ^a	0.007 ^a	-0.268 ^a	0.197 ^a
COE								
Actual growth, $t-1$ to 2001								
Converted	0.054	0.032	-0.037	-0.021	0.049	0.007	-0.217	0.081
Unconverted	0.043	-0.022	-0.071	-0.065	0.053	0.001	-0.278	0.153
Estimated growth (resulting from conversion)	0.033	0.067 ^a	0.035 ^a	0.035 ^a	0.011	0.025	0.511 ^a	0.025

COE = collective-owned enterprise

R&D = research and development

SOE = state-owned enterprise

VA/K = value added/net value of fixed assets

VA/L = value added/employment

a. At least one coefficient relevant to the total conversion effect is statistically significant at the 10 percent level or greater.

issues associated with China's shareholding experiment. With regard to its effects on corporate governance and control, Albert Keidel observed: "... control rather than ownership in China is clearly the most important issue. Because the ownership classification very often doesn't give you a clue about who really controls the enterprise . . . the Party can govern who is the manager; [it] governs a lot of the goals of the enterprise in terms of its ancillary social investments . . . even [for a] privately-owned enterprise. . . ."11 While we lacked data on pre and postconversion managerial control rights, the most robust of the documented performance changes strongly suggest that conversion has led to a reorientation of corporate goals and behavior. Extensive reallocation of effort and resources toward innovation—both R&D and new product development and sales—suggests two forms of change: (1) an emphasis on deep restructuring that entails process and product innovation, and (2) an extension of the time horizon of the firm's owners and management.

Distributive Implications

In addition to changes bearing on long-term efficiency, the conversion of Chinese SOEs to SHRs has distributive implications. In examining the normative or public-policy implications of these distribution effects, we conclude (table 11.10) the following:

- Conversion increases the growth rate of employment and slows wage growth. As table 11.10 shows, the rate of change of these variables is of equal and opposite magnitude. Thus, we surmise that, in the near-to-medium term, the tenure of incumbent workers is extended by conversion, while growth of their compensation is curtailed. Over the long term, the accumulation of nonstate investment and decline in the state's asset share tend to reverse the directions of change in employment and wages.
- Conversion has an insignificant effect on labor's income share. The share of the wage bill (product of employment and wage) in total sales revenue shows no change as a result of either the direct effect of conversion or the subsequent decline in state asset share. Therefore, in China, to date, conversion does not appear to have affected appreciably the income distribution between labor and capital.

11. Albert Keidel is senior associate at the Carnegie Endowment for International Peace (CEIP). A transcript of Keidel's comments on an earlier draft of this chapter was presented at the conference on Distributional Consequences of Privatization, Center for Global Development, DC, February 23–24, 2003. Minxin Pei, senior associate and director of the China Program at CEIP, also raised the issue of implications of enterprise restructuring in China for governance.

- Following conversion, at least among the SHRs within this study sample, the state and the public retain the assets that had existed in the pre-converted SOEs. Decline in state asset shares results not from the dissolution of state assets either by sale or stripping—rather, it results from converted enterprises’ ability to attract new investment.
- Although we lack data on the assets managers own, we anticipate that, because managers tend to serve as key players in the process of converting Chinese SOEs to SHRs and because nonstate stakeholders’ asset ownership has increased significantly, managers will capture a portion of the new assets that enter the firm. We have no reason to believe that the findings of Li, Li, and Zhang (2000) and Dong, Bowles, and Ho (2002b) are not applicable to this study’s sample—that is, as the principal instigators of ownership reform, which results, on average, in a doubling of nonstate assets within the firm, managers of converted enterprises increase their net wealth.
- Evidence in support of deep restructuring—expansion of R&D and new product development, as well as short- and medium-term efficiency gains resulting from conversion—suggests that those who maintain an employment or financial interest in the firm stand to gain over time.
- Beyond the immediate stakeholders of the firm, China’s consumer sector benefits from resources drawn into R&D and innovation. During the past 10 to 15 years, a striking range of consumer goods and improvements in medical technologies and education sectors, including increased access to computer and telecommunications equipment, have become widely available in China. Thus, conversion appears to contribute to product quality and variety.
- As a result of the concentration of SOEs in China’s northeastern and eastern regions and the somewhat higher probability of their conversion in these regions, stakeholders residing in coastal provinces are more likely to benefit from China’s shareholding experiment than those in other regions. By comparison, in northern and southwestern provinces—China’s two poorest regions—SOEs are scattered, and their probability of conversion is somewhat less. Thus, such biases may cause China’s shareholding experiment to contribute to growing regional inequality.

Public-Policy Implications

Two key normative aspects of the distributive findings outlined above are

- the role of growing inequality in China’s economy, and
- appropriate public-policy measures to deal with the growing inequality.

The implications of the distributive effect of enterprise restructuring differ across countries and regions. In Latin America, for example, privatization that exacerbates an already skewed distribution of income should be—and, for the most part, is—viewed critically. In China, by contrast, restructuring that creates skewed asset ownership may be a more defensible phenomenon. The reasoning is that, before China’s economic reforms, accumulation of personal wealth was generally banned; thus, it is inevitable that introducing elements of a market economy would lead to greater inequality of wages and assets. In short, increasing inequity may be a painful, but necessary, price that must be paid to transit to a more dynamic economic system. Independent of the conversion of China’s domestic SOEs, introducing foreign investment and the entry of private enterprise would also lead to skewing.

This background leads to two observations. First, the original SOE stakeholders may perceive that conversion leads to more unequal distribution of assets. From a broader perspective, by increasing China’s emergent managerial and entrepreneurial class, SOE conversion creates a source of innovation in the country’s economy—factors in scarce supply before ownership reform. By helping to enlarge China’s entrepreneurial and investment class, and possibly competing away some of the monopoly rents captured by emergent entrepreneurs and investors, the shareholding experiment, arguably, is creating more, not less, equality.

The second issue centers on ideal income distribution.¹² Most analysts and many ordinary Chinese citizens would agree that, during the period of central planning and socialist ownership, opportunities for personal investment in human, financial, and physical capital and prospects of a competitive return on such investment were too limited. China’s income and asset distribution was far too uniform. SOE conversion is one avenue to redress this inefficiency. While growth of inequality may be a necessary and desirable aspect of China’s economic transition, a key issue is whether reallocation and accumulation of income and assets are being accomplished through an appropriately transparent and fair process. While anecdotal evidence suggests that aspects of the conversion process are not transparent and equitable, we infer, at least from this limited study sample, that assets the state retained at the beginning of the process remain intact. In contrast to many documented instances in Eastern and Central Europe and the former Soviet Union, this study sample does not reveal widespread evidence of asset stripping.

What is the appropriate policy response to the finding that enterprise conversion contributes to inequality—assuming that the shareholding conversion process in China is generally lawful and legitimate? Public control

12. Forbes (2000), for example, found that, on average, countries grow faster if their Gini coefficient is lower; over time, however, individual countries that lower their Gini coefficients face slower growth of overall living standards.

over corporate governance is but one of many instruments available to governments in their pursuit of equity. Others include taxation, education, economic freedom (e.g., mobility), and international trade policies. Across China, provincial and local governments are attempting to construct effective unemployment, pension, and other social insurance systems—at least in urban areas where SOEs are being converted. Compared with established systems in other industrialized economies, these institutional arrangements remain rudimentary; however, by facilitating the transfer of workers across firms, they may serve as a more effective avenue of remunerative employment than the relatively uncompetitive jobs sustained through government impediments to enterprise conversion and restructuring.

China remains in the early stages of movement toward private control of corporate activity; thus, it is still too soon to draw conclusions about shareholding reform's effects on wealth and income distribution across Chinese society. As shown above, the various channels through which conversion affects enterprise performance and distribution of rewards often operate in countervailing directions. Through 2001, for example, the shareholding experiment reduced layoffs and simultaneously slowed wage growth. However, the longer-term, induced effect suggests a reversal that reflects privatization outcomes in other countries. This study observed a robust shift in resources toward innovation and investment following conversion; however, it is premature to anticipate these changes' sustainability or measure their precise effect.

Finally, China's shareholding experiment is contributing to the emergence of an increasingly broad-based managerial and professional class. The extent to which this emergent class uses these assets effectively to create new employment and more broadly disperse wealth remains unclear. Overall, China's shareholding experiment is apparently creating a more vibrant enterprise system, providing opportunities for nonstate investment, innovation, and new product development. In the immediate aftermath of conversion, labor's employment and income shares remain undiminished. The largest distributive effect is likely an enlargement of China's managerial and entrepreneurial class, centered mainly in the country's coastal regions.

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Appendix 11A

Concordance of Ownership Classifications, 1994 and 1999

Ownership category	Code (year)	
	1994	1999
State		
State-owned enterprises	11	110
State-owned, jointly operated enterprises	12	141
Wholly state-owned companies	n.a.	151
Collective		
Collective-owned enterprises	21	120
Shareholding cooperatives	n.a.	130
Collective, jointly operated enterprises	22	142
Hong Kong, Macao, and Taiwan		
Overseas joint ventures	81	210
Overseas cooperatives	82	220
Overseas, wholly owned enterprises	83	230
Overseas shareholding limited companies	n.a.	240
Foreign		
Foreign joint ventures	71	310
Foreign cooperatives	72	320
Foreign, wholly owned enterprises	73	330
Foreign shareholding limited companies	n.a.	340
Shareholding		
Limited liability company	62	159
Shareholding limited companies	61	160
Private		
Private, wholly owned enterprises	31	171
Private cooperative enterprises	32	172
Private limited-liability companies	33	173
Private shareholding companies		174
Other domestic		
State-collective, jointly operated enterprises	51	143
State-private, jointly operated enterprises	52	n.a.
Collective-private, jointly operated enterprises	53	n.a.
State-collective-private, jointly operated enterprises	54	n.a.
Other jointly operated enterprises	n.a.	149
Other enterprises	90	190

n.a. = not applicable

Source: National Bureau of Statistics large and medium-size industrial enterprise dataset, 1995–2001.

Appendix 11B

The Endogeneity Issue

One insufficiently investigated issue in this chapter is endogeneity. Looking at equation (11.), one might anticipate that, in deciding whether to invest, a potential nonstate investor considers the rate of change in one or more of the performance measures—i.e., dependent variables. To illustrate, if investment is attracted to firms that enjoy the most robust growth of profitability, then the rate of nonstate investment and the dependent variable, $\Delta \ln ST_SH_{t-1\ to\ 01}$, will be correlated for two reasons. First, nonstate investment may be raising profitability, the effect that coefficient α_2 is intended to capture. Second, such investment will further strengthen the link between investment and profitability. This reverse causality from profit growth to reduction in state asset share will cause econometric estimates of the magnitude of α_2 to be biased upward. The estimation procedure attributes more importance than it should to the effect of nonstate investment—i.e., reductions in state-asset share.

In principle, one of two approaches to address the problem of simultaneity bias can be used. The first is to create an instrumental variable for $\Delta \ln ST_SH_{t-1\ to\ 01}$, which this study attempted without success.¹³ The second is to create a lag structure between the dependent and independent variables. Again, illustrating this remedy for the case of investment and profitability, this second approach is justified if one expects investment to act on profitability with a lag, but does not expect profitability to affect past values of investment (which it might if investors correctly anticipated patterns of profitability). Under the condition of unidirectionality of causality, from current investment to future profitability, a lag structure should mitigate any tendency toward endogeneity of the investment decision and bias in estimates.

To correct for potential endogeneity, this study lagged the asset ownership variable by one year and reestimated the eight performance equations. With two exceptions, the pattern of estimates for the contemporaneous and lagged values of the dependent variable, $\Delta \ln ST_SH_{t-1\ to\ 01}$, are similar. Notable changes appear in the capital productivity equation, in which the estimate on the lagged asset variable becomes statistically insignificant. At the same time, compared with the estimate shown in table 11.6a, the coefficient on the lagged asset variable in the profit equation becomes statistically significant. The remaining estimates retain levels of statistical significance comparable to those reported using the original contemporaneous time structure. That estimates of the coefficient on lagged values of $\Delta \ln ST_SH_{t-1\ to\ 01}$ in the capital

13. The authors attempted a variety of instrumental variables, for $\Delta \ln Z_{j,t-1\ to\ 01}$; however, none reported an adjusted R-square in excess of 0.06.

productivity equation turn insignificant suggest that investment behavior may be particularly sensitive to capital productivity.

While high growth of profitability would attract a high rate of investment, the absence of any evidence of endogeneity in the contemporaneous estimates may result from the measure of profit the study used, which was not observed profit. Rather, it was sales profit, the difference between sales revenue and production cost of goods sold, which omits overhead, pension obligations, income taxes, and other indirect costs.