

Insider Control vs. Government Control:

A Study of China's StateEnterprise

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Insider Control vs. Government Control: A Study of China's State Enterprise Reform¹

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Abstract

This paper examines the costs and bene⁻ts of government control of enterprises in transition, using a large survey of Chinese state enterprises. We ⁻nd that tighter government control causes more unpro⁻table production and more surplus employment and thus tends to distort more severely enterprises' economic decisions. However, tighter government control also tends to reduce agency costs by forcing enterprise managers to cut wage and bonus when enterprise performance is poor. On net, government control seems to hinder enterprise e± ciency. But control by lower level governments seems to be less e± ciency-decreasing than by their higher level counterparts.

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I. Introduction

The purpose of this paper is to examine the issue of government control of economic activities during transition from socialism. The issue, which is often at the center of policy debates, is best illustrated by the case of State-Owned Enterprises (SOEs) in transition. In summarizing the dit culties of the SOE reform, Qian (1996) notes that SOEs typically su[®] from two types of costs { political (or bureaucratic) costs arising from political control by government as identi⁻ed by Kornai (1980, 1992) and Shleifer and Vishny (1994) on the one hand, and agency costs arising from insiders' control as analyzed in standard corporate nance literature. The current paper advances these analyses further by establishing a linkage between the political costs and agency costs and thus analyzes a possible trade-o[®] between the two costs. The central idea is that, although a tighter government control entails higher political costs, in the absence of large and active private investors and well-functioning institutions of corporate governance, it also can help constrain the abusive behavior of enterprise insiders and thus reduces agency costs. After all, the government is one large \shareholder" as it collects tax revenues as well as interest payments (in the case that the state still owns banks) from the SOE.² By the same token, a weaker government control may reduce political costs, but also likely to increase agency costs.³

The paper provides empirical evidence for this theoretical framework by using a large survey of Chinese SOEs during reform. We ⁻nd that tighter government control causes more unpro⁻table production and more surplus employment and thus tends to distort more severely enterprises' economic decisions. This clearly represents political costs of government control. However, tighter government control also tends to reduce agency costs by forcing enterprise insiders to cut wage and bonuses when the performance is poor. On net, government control seems to hinder enterprise e± ciency. But lower level

²Notice that our analysis of government is di[®]erent from those in the market imperfection literature which implicitly assumes that governments are good-willed and thus can cure market imperfection.

³In fact, the analysis should be also relevant for non-transition economies. For example, Wolfram (1995) ⁻ nds that in the United Kingdom, when water utilities were privatized without creating large shareholders, managers greatly increased their own wage.

governments seem to be more e± ciency-improving than their higher level counterparts. In addition, we ⁻nd that compared with other instruments, direct appointment of enterprise directors seems to be the most powerful means of government control.

The paper's analysis explains the puzzling experience of China's long-standing efforts in reforming SOEs. Early e[®]orts focused on reducing the costs of government control. For example, under the so-called Contract Responsibility System, enterprises were allowed to sell extra output to the market after ful⁻Iling output quotas and retain high proportions of pro⁻t. Furthermore, in some cases, managers were either elected by workers or chosen by auctions for managerial positions. Initial outcomes of these reforms seem to be encouraging.⁴ Most research on Chinese SOEs (e.g., Groves et al, 1994 and Groves, et al 1995) seem to conclude that the reform was very successful.

However, most of the SOE reforms of the 1980s failed to continue during the 1990s due to serious problems in the form of rising agency costs.⁵ Enterprise managers, as agents of the state, frequently fail to be accountable for poor performance. They tend to issue bonuses at the expense of long-term investments in the enterprise. They constantly initiate renegotiation of incentive contracts to their own bene⁻t. In some cases, they adopt various schemes to divert enterprise assets to their own pocket, often at the cost of losing the assets' productive value.⁶ As a result, it was widely recognized in China by late 1980s' that the SOE reform based on the Contract Responsibility System had run into serious problems and that new thinking of the SOE reform was needed. In fact, after 1994, the reform seems to be moving in the direction of partial privatization and building institutions of corporate governance.⁷

⁴For a careful estimation of productivity increase during reform, see Gordon and Li (1995). Controversies do exist regarding the productivity estimations. See Je[®]erson and Rawski (1994) and Woo, et al (1994) for both sides of the dispute. Bai, Li, and Wang (1997) suggest that enterprise level productivity may be a misleading index for SOEs' e± ciency improvement.

⁵See Wu (1994) for detailed institutional descriptions. An important central government policy called Li Shui Fen Liu (\separating pro⁻t and taxes'') came as a fatal blow to the Contract Responsibility System. See State Council (1993) and State Statistic Bureau (1992).

⁶For alarming cases of the agency costs associated with insider control, see Han (1995) and Zheng (1996).

⁷See Central Committee of the Chinese Communist Party (1993), which is an important statement

The standard theoretical framework of analyzing the SOE reform is a principal-agent model, in which the government is the principal and the manager the agent. Thus, simple solutions are implied, e.g., replacing incompetent managers and providing the new managers with autonomy and incentives. Using the same data set as in this paper, Groves, et al (1994) show that after obtaining autonomy and incentives, managers responded by hiring more contract workers and by increasing workers' bonus/wage ratio, although they ⁻nd it a \puzzle" that there is no clear evidence that these changes improved enterprise productivity. In a recent study, Li (1997) provides a careful estimation of Chinese SOEs' productivity growth and arrives at the same conclusion. Similarly, Groves, et al (1995) ⁻nd evidence that when new managers replaced old ones, enterprises' performance improved.

This paper starts from a di[®]erent theoretical framework and examines di[®]erent empirical issues. We argue that the SOE issue is more than an ordinary principal-agent problem, since a large part of the problem is caused by the principal (the government) who has non-economic objectives, as identi⁻ed by Kornai (1980, 1992) and Shleifer and Vishny (1994). In addition, there is the standard agency problem. Thus, our empirical analysis focuses on providing evidence that government control causes SOEs' non-economic behavior and that government control reduces agency cost. Our analysis provides an explanation for the puzzle that there is no strong evidence that managerial autonomy and incentive improved productivity, since these measures both reduce bureuaucratic costs and increase agency costs of the SOE.

The data set we use is a survey of 1,300 (with 769 valid returns) Chinese state enterprises covering the entire 1980s. The data set not only contains conventional accounting statistics but also enterprise directors' (CEOs') responses to qualitative questions. The Appendix gives detailed description of the data set.

The next section presents a simple framework for analyzing government control during transition. After that, we provide empirical evidence on the theory. The ⁻ nal section summarizes the main conclusions.

on the direction of the current reform.

II. Theoretical Analysis

We set up a simple framework to analyze government control of state enterprises by combining two separate lines of literature: those analyzing governments' non-economic objectives (Kornai, 1980 and 1992, Shleifer and Vishny, 1994) and those analyzing the principal-agent relation. Consider a state enterprise with a manager M (the insider) who is under control by B (the bureaucrat). At the moment of our concern, the enterprise's asset generates a cash °ow R, which B cannot verify unless he monitors M directly. This non-veri⁻ able assumption rules out simple incentive contracts based on R.

With probability p, which is exogenous to the model, B monitors M directly. Once B does this, he forces M to invest in \socially useful'' wastes, costing a net social welfare loss x. p is intended to be a simple index of the degree of government control. The x assumption stems from well-documented behavior of bureaucrats.

M[®]s behavior is assumed to be the following. If B does not monitor, M steals and consumes the cash °ow R, forgoing pro[−]table investment projects. This assumption is motivated by the observation that M does not have full claim rights to the enterprise's liquidation value in the future. Thus M would always choose to consume the cash °ow today while having the control right.

Suppose s is the social welfare loss due to under-investment as a result of M's stealing. For simplicity, assume that s is inversely dependent on p, i.e. $s^{0}(p) < 0.^{8}$ Overall, the social welfare associated with a particular degree of government control p is:

$$p(R_{i} x) + (1_{i} p)(R_{i} s(p)) = R_{i} px_{i} (1_{i} p)s(p):$$
(1)

In equation (1), px can be interpreted as the bureaucratic cost of government control. It arises because bureaucrats impose their non-economic objectives upon the enterprise. Similarly, $(1 \ p)s(p)$ represents the agency cost of insider control, owing to abusive behavior of insiders. The trade-o[®] between the costs and bene⁻ts of government control

⁸One can easily elaborate the monitoring and punishment technology to endogenize this result. The earlier version of this paper has a more detailed model endogenizing s as well as x. It is similar to that of Hart and Moore (1990).

can be seen by varying p.

A few remarks are necessary. First, in this framework, the ⁻rst-best solution is to make M the sole owner of the enterprise. Then, having full claim rights to the liquidation value of the enterprise, M will not prematurely consume R and instead, will choose the best project to invest. However, if M faces ⁻nancial or political constraints which prevent him from owning the enterprise (that is almost certainly true for medium and large SOEs in transition), this solution is not possible.

Next, the second-best solution is to establish institutions of corporate governance, through which active outside investors, rather than bureaucrat B, closely monitor M's decisions. Unlike B, these outside investors are interested only in monetary returns to investment. This is the model of large shareholders by Shleifer and Vishny (1986). During transition, both large shareholders and corporate governance are only beginning to emerge, so that the second-best arrangement is also infeasible.

The simple framework yields three simple predictions. The \neg rst prediction is on bureucratic costs. That is, when government control is tighter (i.e., p is higher), then the bureaucratic costs are higher. Also, when x is reduced, i.e., the government is more e± ciency-oriented, this relationship is weaker. Figure 1 illustrates this prediction.

(Insert Figure 1 here)

The second prediction is on agency costs. When government control is tighter, (p is higher), the agency costs are lower. Furthermore, when s(p) is smaller for every $p \mid e.g.$, government has more information on enterprise insiders \mid this e[®]ect is stronger. This prediction is also illustrated in Figure 1.

The third prediction is on the overall e° ect of government control. As a normative theory, the framework predicts that there is a socially optimal degree of government control, p° , which balances the two costs of the enterprise. Moreover, when the government is more e_{\pm} ciency-oriented, i.e., x is lower, p° should be higher.

Notice that the last prediction is normative in nature. An important positive question is whether in reality the degree of government control is too high or too low for the

purpose of social e± ciency. We tend to expect that it is too high so that the net e[®]ect of government control is negative. The argument is that typically, reformers are under lobbying pressure by bureaucrats who stand to lose during a reform. Therefore, the equilibrium of the political game of reform generates a higher degree of government control than what is socially optimal.

III. Empirical Issues to be Examined

Motivated by the three predictions in the last section, we examine three empirical issues on the costs, the bene⁻ts, and net e[®]ect of government control of state enterprises, respectively. We expect that the conclusions will vary depending on the level of the government (central, provincial, and sub-provincial level) that supervises the state enterprise. In general, lower level governments are expected to be more concerned with economic performance of state enterprises, since they face harder budget constraints and tougher inter-regional competition (Dewatripont and Maskin, 1995 and Qian and Roland, 1996). However, as argued by Huang (1996), lower level governments also bear more direct burden of social instability and therefore are very concerned with main-taining employment. Therefore, empirical evidence is needed to study the combined e[®]ects.

The "rst empirical issue is on the costs of government control. In particular, we are interested in studying whether tighter government control causes state enterprises to make more unpro⁻ table products and to hire more surplus workers. These are unique problems of the SOEs caused by government's non-economic objectives. The dependent variable we use for ⁻nancial loss (Loss) is the answer to the survey question for directors, \(I) is your enterprise making unpro⁻ table products? If so, what percentage of your total output is unpro⁻ table?" Loss is a cross-sectional variable for the year of 1989.

As an index of surplus workers, we use the ratio of production workers to nonproduction workers, who are the closest proxies for surplus employment. The dependent variable we use is this ratio divided by its industry mean (there are 39 industries). According to standard classi⁻ cation in China, which was followed in the survey, active

(non-retired) employees in Chinese SOEs are divided into: managers, engineers and technicians, and workers. Workers are further divided into production workers, sales personnel, and non-production workers. Surplus employment is almost exclusively concentrated in non-production workers. In fact, in the survey, an overwhelming proportion of enterprise directors replied that they had severe surplus of non-production workers but mild shortage of production workers. Essentially, ⁻ring some of the non-production workers will not decrease output and may even increase output by increasing the wage pool that can be distributed to production workers. In short, although not all of non-production workers are non-productive, the amount of non-production workers should be a reasonable index for workers with zero marginal products.

The second empirical issue we analyze is the bene⁻t of government control in reducing agency costs in SOEs. Measuring the agency costs in SOEs, we focus on managers' lack of accountability for poor performance, which has been so wide-spread in China that a popular phrase was coined: bao ying bu bao kui, i.e., incentive contracts are honored when having pro⁻ts but defaulted on when having losses. This was a leading cause for the demise of the experiment of the Contract Responsibility System in Chinese SOEs.

The dependent variable for studying agency costs is a zero-one variable. It is one, if in a year, the per capita compensation (wage plus bonus) increases but the performance has decreased. It is zero, otherwise. Two Probit regressions are run with two alternative measures of enterprise performance: changes in real value-added and changes in the sum of Pro⁻t remittance, Tax payment, and Interest payments (PTI). PTI is the best estimate of the enterprise's contribution to outsiders.

The third empirical issue we study is the net e^{\otimes} ect of government control on enterprise e_{\pm} ciency, i.e., whether tighter government control reduces the enterprise's e_{\pm} ciency. As discussed above, our prior is that the total e^{\otimes} ect of government control is negative on e_{\pm} ciency. We also expect that for lower level governments, the e^{\otimes} ect is less negative.

The dependent variable for this test is an index of the enterprise's gross return on

capital, R, which is de ned to be the enterprise's gross prot divided by capital.⁹. Gross prot is: Sales - Material Costs - Market Wage. Both Sales and Material Costs are re-evaluated at market prices, in order to correct for the dual-track pricing.¹⁰ Given that for years before 1986 there are no market prices on raw material inputs available, this index is only calculated for years between 1986 and 1989. The Market Wage is calculated as the enterprise's total employment times the corresponding province's non-state sector's (which is under direct market discipline) base wage rates, which is the best proxy we can get for the social cost of labor. Finally, the replacement value of capital (including working capital which is mostly omitted in conventional productivity analysis) is calculated by adding up investments and adjusting for the price index of investment goods and depreciation.

The gross return on capital should be a better index of enterprise performance during reform than most existing ones. The gross return measures the total social surplus to be divided among the employees, the government, the creditors in the form of retained pro⁻t, taxes, and interest payments, respectively. Thus, it is not in^ouenced directly by how the surplus is divided (unlike standard accounting pro⁻t). Also, this index incorporates both productivity increases and the quality of managerial decisions, which are left out in traditional productivity analysis.

IV. Construction of Independent Variables

We use four major independent variables to measure government control. The de⁻nition and sample mean are listed in Table 1. Together, they cover all of the major reform measures and thus the intensity and scope of government control during the 1980s in China.

⁹The conventional approach is to estimate the production function and identify the growth of the residual as the total factor productivity growth. Such an approach is potentially °awed when applied to state enterprises, since the behavior of the state enterprises may be di®erent from pro⁻t maximization. See Bai, Li, and Wang (1997).

¹⁰Dual-track pricing existed between 1985 and 1991. Under this system, each product had two prices: market and planned.

Appointment is a critical variable. Our maintained hypothesis is that a government appointed director is more willing to follow government instructions than those who are not appointed by the government, not only because the government o± cial must have chosen relatively obedient managers for the directorship but also because the appointed director's career is now mostly at the control of the government. Before reform, all directors were appointed by the government. Alternative methods of appointment appear only after reform. See Groves, et al (1995) for related institutional background on the auctions of managerial positions.

Party represents a slightly more complicated situation than Appointment. In general, we expect that Party = 1 enables the government to control the director more tightly.¹¹ However, there may be another e[®]ect present. That is, by assuming the position of the Party chief, the director is better positioned in the bureaucracy and thus is more capable of bargaining with the government. A priori, we do not know the net e[®]ect of making a director the local Party chief.

Both Autonomy and Incentive are commonly used in studies of Chinese state enterprises (e.g., Groves, et al, 1994). Indeed, they do capture the most visible measures of reform.¹² However, as can be seen later, compared with Appointment and P arty, these two variables are typically much less prominent in a[®]ecting enterprise behavior. Incidentally, we are not aware of any previous studies that combine all these variables.

There are a few other independent variables used in the regression. For example, we have dummies for the level of government (central, provincial, and sub-provincial) that

¹¹Before reform, all enterprise directors were invariably the Party chief, or senior Communist Party o± cials in the enterprise. This arrangement was widely known as the \Party's Unitary Leadership" (Dang De Yi Yuan Hua Ling Dao). One exceptional period is the Cultural Revolution, when many local Party Committees were replaced by the Revolution Committees, which were controlled by the Red Guards and alike. During the reform, the intended change can be summarized as \separating the Party a®airs from the government a®airs".(Dang Zhen Feng Jia) Despite the reform e®orts, Party control is still rather prevalent. Qian (1996) has an extensive discussion of this.

¹²Our de⁻nition of Incentive is the same as that in Groves, et al (1994). However, the mean of our Incentive is much smaller | e.g., 34 percent in 1989 rather than 64 percent in their report. The reason seems to be that their study is based on a sub-sample of the data set with only ⁻ve industries.

supervises the state enterprise, the industry group (mining, heavy industry, chemical, heavy manufacturing, and light industry), and the year, respectively.

A potential problem with the following tests is endogeneity of the independent variables. The problem is most serious with Appointment and Party. For example, one may suspect that enterprises which lose pro^-t , or are laden with non-production workers, or are di± cult to monitor are chosen to have Appointment = 1 or Party = 1.

We adopt two alternative approaches to deal with the endogeneity problem. For the regression on unpro⁻table production, where we only have one year's cross-sectional data, we rely on instrumental variables. In all other cases, where there is a panel-data setting, for each year and each enterprise, we generate a dummy variable, SelectionDummy, which is 1, if either one year or two years later, we observe Appointment = 0 or Party = 0. Otherwise, SelectionDummy = 0: Thus, SelectionDummy indexes reforms to come. The coe± cients of SelectionDummy should capture and control for the endogeneity e[®]ect, since in our sample, there is at most one change of value in SelectionDummy (i.e., no reversal of reform). For example, in a regression on surplus employment, if the coe± cients of SelectionDummy are found to be negative, then this shows that those enterprises having less surplus employment initially are selected to have non-government appointed directors or directors without Party chief positions. Consequently, the coe± cients of Appointment and Party are left alone to re^oect their direct e[®]ects on suplus employment. This technique was pioneered by Heckman and Hotz (1989) and was also adopted by Groves, et al (1994), who have the same set up as we do here.

As for Autonomy and Incentive, endogeneity is much less likely to be a problem. Both autonomy and incentives were granted in close connection with the implementation of the dual-track system, in which enterprises were allowed to sell to the market beyond pre-determined quotas. The implementation of the dual-track system was not systematically linked to an enterprise's economic condition. Rather, the system was product-based.¹³ Regressions using alternative instrumental variables, including lagged Autonomy and Incentive, generated very similar results.

¹³See Yang and Li (1993) for institutional descriptions of the implementation of the dual-track system.

A much more pertinent concern with Autonomy and Incentive is how well they capture relaxed government control. A very common scenario is that governments use Autonomy and Incentive as bargaining chips to increase their control over other aspects of enterprise activities. We need to bear this in mind in interpreting the results.

V. Estimation Results

The Costs of Government Control | Evidence on State Enterprises' Non-Pro⁻t-Maximizing Behavior

Table 2 studies two kinds of SOEs' non-pro⁻t-maximizing behavior as results of government control: production of unpro⁻table goods and hiring surplus workers. In the sample, nearly 47 percent of the enterprises were making some unpro⁻table products. Among those loss-makers, on average 27 percent of their output was unpro⁻table. This is very similar to economy-wide statistics (see Li and Li, 1997). As for the extent of non-production workers, it was decreasing slightly during reform. In our sample, the ratio of production worker to non-production worker is 9.73 for 1980 and for 1989, the ratio is around 10.5.

The ⁻rst regression is based on the following model:¹⁴

$$Loss_{i} = c_{jk} + \bar{k}X_{i} + \bar{k};$$
(2)

where Loss_i, $X_i = (Appointment_i; Party_i; Autonomy_i; Incentive_i)$ are observations of 1989; i indexes the enterprise; j = 1; ...; 9 the enterprise's attributes (⁻ve industry groups | mining, heavy industry, chemical, heavy manufacturing, and light industry | and four provinces); k = 1; 2; 3 the attributes of the government that supervises the enterprise (central, or provincial, or sub-provincial). This is a cross-section regression for 1989. The estimation was implemented in a single regression with $c_{j,k}$ and \bar{k} being indexed by dummy variables.

¹⁴A Tobit-type regression on Loss was also run. The results are very close to those of the linear regression in Table 2. We choose the simple linear regression in order to implement the instrumental variables estimation. This approach is similar to that of Barberis, et al (1996).

In order to deal with the potential endogeneity of Appointment and Party, we use three groups of instrumental variables. The ⁻rst group contains the duration of the director's appointment and the enterprise's incentive contract. The second group is attributes of the director: whether the director is a college graduate and whether the director regards bonuses as an important source of motivation. The third group consists of initial conditions of the enterprise when the manager was ⁻rst appointed (generally around 1985 or 1986): per capita subsidies, manager's annual wage, and percentage of self-investment in total investment. These variables are clearly correlated with Appointment and P arty. But given the speci⁻c institutional settings in China during the 1980s, it is extremely unlikely that they directly in °uence Loss via other channels. See Appendix for detailed arguments.

The second regression in Table 2 is a panel-data regression in the following form:

$$Prod_{it} = c_i + c_{tk} + c_{jk} + \bar{k} X_{it} + w_k d_{it} + 2_{it};$$
(3)

where P rod_{it} is calculated in two steps: rst, compute the ratio between production and non-production workers in enterprise i and year t and second, divide this ratio by its industry mean; c_i is the $rxed e^{e}ect$; j = 1; ...; 9 indexes attributes of the enterprise (four provinces and rve industry groups: mining, heavy industry, chemical, heavy manufacturing, and light industry); k = 1; 2; 3 the attributes of the supervising government; t = 1; ...; 10, indexing the years from 1980 through 1989; and X_{it} is the same as in equation (2). Time-varying constants are included in the model in order to control for a potential time trend. d_{it} in equation (3) is the SelectionDummy discussed above.

We are now ready to discuss the results in Table 2 and we do so in four parts. First, direct appointment of enterprise directors (Appointment = 1) is found to be a an important instrument for government to implement its political objectives. The results show that direct appointment increases pro^-t losses as well as surplus employment. That is, tighter government control imposes more $e^{i\theta}$ ectively non-economic objectives upon state enterprise.

Second, the Party e[®]ects are mixed. At the central government level, Party increases

Loss and non-production employment. But, for lower level governments, the results are less clear. In fact, for provincial governments, Party reduces Loss. It seems that these results are due to the peculiar e[®]ect of Party explained above, i.e., making the director senior Communist Party o± cial enhances his bureaucratic status and sometimes helps him in fending o[®] demands of government o± cials. However, as shown later, this is not a robust result.

Third, Incentive does have the intended e[®]ects on reducing the enterprises' losses and surplus labor but the e[®]ects are rather small, while the e[®]ects of Autonomy are ambiguous. For example, a ten percent increase in Incentive for a central government controlled enterprise only reduces Loss by 2.2 percent. This is consistent with Shleifer and Vishny (1994) who argue that giving managers cash °ow rights strengthens their will to ⁻ght against government demands. The ⁻ndings on Autonomy are di[®]erent from the ⁻ndings of Groves, et al (1994). The di[®]erence seems to be that we control for other attributes of government control and they only have Autonomy and Incentive in their regressions.

Fourth, it is interesting to compare the results across di[®]erent levels of government. Combining the Appointment and P arty e[®]ects, since they often happen together, one can see that tighter control by central government causes higher increases in Loss than that by local governments. However, on the issue of non-production employment, the pattern is not clear. It appears that these two ⁻ndings are mutually inconsistent. But, as supported by Table 4, a simple explanation is that although lower level governments are more concerned with social stability and are more willing to push for surplus employment, but they also have tighter control of the enterprises' per capita wage increases. Therefore, overall enterprises under their control have smaller losses.

Incidentally, the coe± cients on SelectionDummy indicate that central and provincial governments tend to choose \leaner'' enterprises (those with less non-production workers) to loosen their control. Notice that this does not mean that the results are spoiled by endogeneity, which is already controlled for by SelectionDummy.

Before moving on, two potential concerns need to be addressed. The rst one is:

Does government control cause Loss, rather than the other way around? This concern is acute since there is no direct way to test the validity of the instrumental variables used in regression (2). To provide a crude answer, we present Table 3. It is based on directors' answers to the question: why do you make unpro⁻table products? The table shows that the most frequent and important answers are that Loss is due to direct government command (\force'') or that it is because of employment pressure (\to maintain employment for surplus workers''), which we have shown is caused by government control. Thus, we have another evidence that it is government control that causes SOEs' non-pro⁻t-maximizing behavior, instead of the other way around.

The second concern is about the interpretation of Loss, i.e., does Loss represent lower social e± ciency? Can it be the case that government, motivated by social e± ciency and prompted by price distortion or market imperfection, forces enterprises to incur losses? In order to address this concern, we re-ran the Loss regression for \liberalized" industries, i.e. the light manufacturing industries. In such industries, by 1989, prices as well as entry were no longer controlled. Therefore, in these industries, loss of pro⁻t almost surely represents real social loss. The results are found to be very similar to those in Table 2. Therefore, we do not believe that our ⁻ndings are purely driven by governments' desire to improve social e± ciency.

The Bene⁻ ts of Government Control | Containing Agency Costs

Table 4 shows the results of two Probit regressions described by the following model:

$$Prob(WB_{it} = 1) = {}^{\odot}(c_{ik} + c_{tk} + {}^{-}_{k}X_{it} + {}^{*}_{k}d_{it});$$
(4)

where $WB_{it} = 1$ if per capita compensation increases in year t but performance decreases during that year (this will be called improper wage increase); [©] (:) is the cumulative normal distribution and other variables are the same as those in equation (3).

In the ⁻rst regression, enterprise performance is measured by value-added in real terms. In the second regression, we replace the performance measure by PTI, the sum

of pro⁻t-remittance, tax, and interest payments. In other words, the second regression studies whether the managers are accountable for decreased contribution to outsiders. As can be seen, the results are similar to each other.

There are four noteworthy indings in Table 4. First, as expected, for provincial and sub-provincial government supervised state enterprises, Appointment is found to improve significantly managerial accountability. The estimates imply that Appointment = 1 reduces the frequency of improper wage increase by approximately 24 percent and 8.2 percent, respectively for these two kinds of enterprises. However, for central government supervised enterprises, the results are statistically insignificant. Second, making the enterprise director the Party chief (Party = 1) only has e[®] ects on sub-provincial government supervised enterprises. This reduces the frequency of improper wage increase by about 14 percent.

Third, compared with Appointment and Party, Autonomy and Incentive are found to have very small e[®]ects on either improving or reducing managerial accountability. In fact, for sub-central government supervised enterprises, even an 100 percent increase in either Appointment or Incentive cannot match the impact of making Appointment from 0 to 1. Given that our a priori expectation is that Autonomy and Incentive may reduce managerial accountability, these results are somewhat surprising. They indicate that local governments tend to tighten up their e[®]ort to guard against managerial abuse after granting managerial autonomy and incentives.

Fourth, the regressions show that local governments are more e[®] ective in improving managerial accountability than central government. In fact, most coe± cients for central government surpervised enterprises are statistically insigni⁻ cant and all coe± cients for the other government controlled enterprises are all negative and mostly signi⁻ cant. These results are consistent with existing theories on local government behavior. Relating to Huang's (1996) argument, this ⁻nding shows that although local governments push its SOEs to hire extra labor as was shown above, they are also very watchful at SOEs' per capita compensation.

The Net E[®]ect of Government Control on E_± ciency

Table 5 lists results of the following regression:

$$R_{it} = c_i + c_{jk} + c_{tk} + \bar{k} X_{it} + w_k d_{it} + 2_{it};$$
(5)

where R_{it} is the gross rate of return on capital as de⁻ned previously and other variables are the same as in equation (3). The time-dependent constants are included in order to ⁻Iter out any time trend.

The sample average of R decreases steadily between 1986 to 1989, the years for which data is available to do the current estimation. In 1986, the sample mean is 13.9 percent and by 1989, it is 8.67 percent. The trend is even more prominent when in^o ation is taken into account. This is a widely recognized and worrisome trend during China's reform (see Li and Li, 1997 for discussions). In the regression, the time trend is taken into account by including year dummies.

Again, the ⁻ndings of Table 5 can be described in four parts. First, not surprisingly, Appointment is found to reduce the rates of return on capital by an amount ranging from 1.8 percent to 5.6 percent a year. The exception is provicial government supervised enterprises, for which the results are statistically insigni⁻ cant. Second, the Party e[®]ect also reduces the rate of return by an amount ranging between 0.47 to 2.8 percent a year, although the estimation for sub-provincial government controlled enterprises is statistically insigni⁻ cant.

Third, Autonomy and Incentive have very small e[®]ects on the rate of return in either direction. In fact, one has to increase or decrease Autonomy and Incentive by 100 in order to get the same e[®]ect of changing Appointment or Party from 0 to 1, while the standard deviation of former two variables is in the range of 30 to 40. The results here are similar to those of the ⁻nal regressions of Groves, et al (1994). This shows that the net e[®]ect of autonomy and incentive on e[±] ciency is unclear.

Fourth, combining the e[®] ects of Appointment and Party, the most prominent means of government control, one can see that tighter control by central government (by switching Appointment and Party from 0 to 1) reduces the return rate more drastically than that of local governments. In fact the combined e[®] ect of keeping Appointment = 1 and P arty = 1 at the central government level is a 8.4 percent decrease in the return rate. Taking insigni⁻ cant coe \pm cients to be 0, the combined e[®]ects for provincial and sub-provincial governments are 0.47 and 1.9 percent, respectively. Such a pattern is expected given previous results.

One caveat should be discussed regarding the interpretation of these results. There are only four years of observations on R, due to data availability of the market price. Also, unlike the index of the Net Present Value (NPV), R may be a poor index for measuring the enterprise's long-term performance. Thus the long-term bene⁻ts of government forcing SOE managers to reduce wage and bonus and to invest may be underestimated. However, we seriously doubt that this will qualitatively change the result, since the quality of the investment projects are often questionable.¹⁵

A Brief Summary of the Estimation Results

It is useful to compare and summarize the results. The strongest evidence is on the appointment e[®]ect. Government appointment intensi⁻es enterprises' non-economic behavior, while enhances managerial accountability. But overall, the ⁻rst e[®]ect dominates the second, as shown by the last regression. Very similar to this is the Party chief e[®]ect, although the evidence on its increasing ⁻nancial loss is mixed.

There is weak evidence on the e[®]ects of autonomy and incentive. They seem to help reduce enterprises' non-economic behavior, but overall, they are not positively correlated with enterprise e± ciency. While more research is highly necessary, we are tempted to take this as evidence that managerial autonomy and incentive are of secondary importance when compared with issues concerning managers' human capital, which are partially captured by Appointment and Party (see Barberis, et al, 1996 for evidence on this from Russia).

On the central/local government comparison, the general picture is rather robust. Lower level governments are more likely to be e[®]ective in curbing managerial abuses and

¹⁵In fact, even the reformist leaders in China openly recognize this and criticize the SOEs for this. For example, Zhu Rongji (1997), the economic Vice Premier, lists \duplicative investments" as the leading reason for the poor ⁻nancial performance of SOEs.

less aggressive in forcing unpro⁻table production. Overall, control by lower level governments seems to be less e± ciency-reducing than control by higher level governments.

VI. Conclusions

In order to study the role of government in transition from socialism, this paper examines the issue of the State-Owned Enterprise (SOE) reform. Unlike most previous works on SOEs, we argue that the SOE issue is more than a standard principal-agent problem with the government being the principal and the manager the agent, since there is a unique problem with the SOEs, i.e., the principal (the government) has non-economic objectives, as identi⁻ed by Kornai (1980, 1992) and Shleifer and Vishny (1994). Thus, reducing government control improves e± ciency. At the same time, there is also the standard agency problem, i.e., managers tend to abuse their power. Therefore, reducing control of SOEs by the government, who is in fact a large shareholder because of the need of tax collection, may actually increase agency costs. Combining both aspects, there is a trade-o® between the costs and bene⁻ts of government control during transition. Thus, the SOE reform needs to strike a balance between these two e®ects, until private large shareholders and institutions of corporate governance ⁻nally emerge.

The paper provides evidence for this theoretical framework by using a large survey of Chinese state enterprises from the 1980s. We ⁻nd that direct appointment of enterprises' top managers is an important means of government control during transition. Tighter government control forces enterprises to make more unpro⁻ table production and to hire more non-production workers. At the same time, tighter government control also makes it more likely that managers decrease the enterprises' per capita compensation when performance is poor. But, the total e[®]ect of government control is negative on enterprise e± ciency. Moreover, lower level governments are found to be less aggressive in pushing for unpro⁻ table production, more likely to enforce managerial accountability, and thus, less damaging on enterprise e± ciency.

By implication, these conclusions imply the importance of restructuring government incentives and behavior during transition. If governments, or more speci⁻cally, bureaucrats, are provided with more economic incentives associated with tax revenues and

other economic criteria and therefore are less obsessed with political and bureaucratic objectives, then the costs of government control decrease and the bene⁻ts of government control increase. Government control is more desirable and a smoother transition can be expected. This seems to be a robust and profound lesson from the relative success of China's economic reform so far.¹⁶

Appendix

The Data

The data set is based on a survey of 1,300 (769 valid returns) Chinese state enterprises covering the entire 1980s. This is the same data set used by Groves, et al (1994) and Groves, et al (1995). The survey represents by far the greatest investment of ⁻ nancial and intellectual resources aimed at obtaining detailed data from Chinese state enterprises. (See Dong and Tang, 1995 for a summary of the project.)

Enterprises were sampled almost evenly from four provinces in China: Jiansu in the coastal region, Jilin in the northeast (Manchuria), Shanxi from the north, and Sichuan in the southwest, representing three prototypes of Chinese provinces. The sample's coverage of industries (39 in total) is representative of China's overall industrial structure. However, large (22 percent) and medium (48.2 percent) size enterprises are over-represented. In terms of ownership attributes , central government owned (or controlled) enterprises seem to be under represented (8.5 percent) and so are provincial government owned (or controlled) enterprises (9.5 percent). The majority of observations are from municipal government owned enterprises (70.4 percent). County owned (or controlled) enterprises form the rest of the sample.¹⁷

¹⁶For example, the di[®]erence in the speed of entry of new enterprises between China and Eastern Europe can be explained by the di[®]erence in tax structure which has important incentive implications for bureaucrats. See Gordon and Li (1997).

¹⁷See Dong and Tang, 1995 for detailed description of the sampling design.

There are two parts to the data set, both of which were collected in early 1990. The ⁻rst part comes from surveys of enterprise directors (the counterparts of CEOs in the West) between late 1989 and early 1990. It mostly consists of attitudinal and qualitative questions with multiple choices.

The second part of the data set is based purely on accounting information concerning the enterprise, covering the period of 1980{1989. In addition to standard (government required) accounting data, such as output, input, investment, employment, and capital, certain detailed information concerning the government-enterprise relation is also available.

Instrumental Variables

We believe the three groups of variables are suitable instruments because these variables are closely correlated with Appointment and P arty and this is their only channel to in°uence Loss. Longer contracts signalling higher intensity of reform measures are usually given to new directors who are not appointed by the government or who are not senior Party o± cials in the enterprise. College graduates are most likely to be appointed by the government to the directorship, since there has been an intentional policy to increase the average education level of government o± cials. Also, governments are also likely to choose those obedient managers who would not openly express a lot of interest in bonus. Finally, the initial conditions are clearly prominent parameters determining whether the governments continue appointing directors.

At the same time, we ind it very unlikely that these variables directly in ounce the enterprises' proitability through channels other than Appointment and Party, due to the institutional settings in China during the 1980s. In other words, these variables are not correlated with the error term of the Loss equation. Contracts are frequently renegotiated ex post, therefore, the duration of contract should have little incentive effects and no direct implications for ex post proitability. Better educated directors do not necessarily have better managerial skills and then lower Loss, since the education system was not geared towards the market system. In fact, the director's college degree may well be in irrelevant induction of Source and Sourc

literature. Similarly, those managers openly expressing interests in bonus may not be more interested in reducing Loss than others, since when loss is incurred, bonus is most likely determined by bargaining with government. The same manager may ⁻nd it more worthwhile to devote energy into bargaining with government than to reduce Loss. Finally, the initial conditions are least likely to be relevant to future pro⁻tability, given the enormous changes in market environment and prices during reform in 1980s.

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Figure 1: Bureaucratic Costs and Agency Costs in a State Enterprise

NameDescriptionYearMeanSt.Dev.AppointmentWhether the enterprise director was directly appointed by the government (yes=1)1980-19890.8360.370PartyWhether the enterprise director was the "rst- or second-secretariat of the enterprise's Communist Party Committee (yes=1)1980-19890.9340.248IncentiveContractual (ex ante) percentage of sold to the market rather than delivered to the government1980-198932.229.1					
AppointmentWhether the enterprise director was directly appointed by the government (yes=1)1980-19890.8360.370PartyWhether the government (yes=1)1980-19890.9340.248PartyWhether the enterprise director was the "rst- or second-secretariat of the enterprise's Communist Party Committee (yes=1)1980-19890.9340.248IncentiveContractual (ex ante) percentage of marginal pro"t retention1980-198932.229.1AutonomyPercentage of output sold to the market rather than delivered to the government1980-198920.840.6	Name	Description	Year	Mean	St.Dev.
director was directly appointed by the government (yes=1) Party Whether the enterprise 1980-1989 0.934 0.248 director was the ⁻ rst- or second-secretariat of the enterprise's Communist Party Committee (yes=1) Incentive Contractual (ex ante) 1980-1989 32.2 29.1 percentage of marginal pro ⁻ t retention Autonomy Percentage of output 1980-1989 20.8 40.6 sold to the market rather than delivered to the government	Appointment	Whether the enterprise	1980-1989	0.836	0.370
appointed by the government (yes=1) Party Whether the enterprise 1980-1989 0.934 0.248 director was the rst- or second-secretariat of the enterprise's Communist Party Committee (yes=1) Incentive Contractual (ex ante) 1980-1989 32.2 29.1 percentage of marginal prort retention Autonomy Percentage of output 1980-1989 20.8 40.6 sold to the market rather than delivered to the government		director was directly			
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PartyWhether the enterprise director was the "rst- or second-secretariat of the enterprise's Communist Party Committee (yes=1)1980-19890.9340.248IncentiveCommunist Party Committee (yes=1)		(yes=1)			
director was the ⁻ rst- or second-secretariat of the enterprise's Communist Party Committee (yes=1) Incentive Contractual (ex ante) 1980-1989 32.2 29.1 percentage of marginal pro ⁻ t retention Autonomy Percentage of output 1980-1989 20.8 40.6 sold to the market rather than delivered to the government	Party	Whether the enterprise	1980-1989	0.934	0.248
second-secretariat of the enterprise's Communist Party Committee (yes=1) Incentive Contractual (ex ante) 1980-1989 32.2 29.1 percentage of marginal pro ⁻ t retention Autonomy Percentage of output 1980-1989 20.8 40.6 sold to the market rather than delivered to the government		director was the ⁻ rst- or			
the enterprise's Communist Party Committee (yes=1) Incentive Contractual (ex ante) 1980-1989 32.2 29.1 percentage of marginal pro ⁻ t retention Autonomy Percentage of output 1980-1989 20.8 40.6 sold to the market rather than delivered to the government		second-secretariat of			
Communist Party Committee (yes=1) Incentive Contractual (ex ante) 1980-1989 32.2 29.1 percentage of marginal pro ⁻ t retention Autonomy Percentage of output 1980-1989 20.8 40.6 sold to the market rather than delivered to the government		the enterprise's			
(yes=1) Incentive Contractual (ex ante) 1980-1989 32.2 29.1 percentage of marginal pro ⁻ t retention Autonomy Percentage of output 1980-1989 20.8 40.6 sold to the market rather than delivered to the government		Communist Party Committee			
IncentiveContractual (ex ante) percentage of marginal pro ⁻ t retention1980-1989 32.232.229.1AutonomyPercentage of output1980-1989 1980-198920.840.6Sold to the market rather than delivered to the government1980-1989 to the government20.840.6		(yes=1)			
percentage of marginal pro ⁻ t retention Autonomy Percentage of output 1980-1989 20.8 40.6 sold to the market rather than delivered to the government	Incentive	Contractual (ex ante)	1980-1989	32.2	29.1
marginal pro ⁻ t retentionAutonomyPercentage of output1980-198920.840.6sold to the marketrather than deliveredto the government		percentage of			
Autonomy Percentage of output 1980-1989 20.8 40.6 sold to the market rather than delivered to the government		marginal pro ⁻ t retention			
sold to the market rather than delivered to the government	Autonomy	Percentage of output	1980-1989	20.8	40.6
rather than delivered to the government		sold to the market			
to the government		rather than delivered			
		to the government			

 Table 1: List of Independent Variables Measuring Government Control

	Regression I: Percentage of Unpro ⁻ table Production in 1989 (Loss)		
	Instrumental Variable Estimation: N=767, R-Sq=0.0250		
	Central Gov. Supervised	Provincial Gov. Supervised	Lower Gov. Supervised
Appointment	4.83	33.00	22.95
	(3.26**)	(2.24**)	(1.96**)
Autonomy	188	.116	.0311
	(-1.86**)	(1.19)	(.916)
Incentive	223	0995	0813
	(-1.65*)	(-1.41*)	(-1.96**)
Party	38.42	-21.49	-10.41
	(2.75***)	(-1.65*)	(-1.19)
Regression II: (Production Workers)/(Non-Production Workers),'80{'89			
	(Divided by the Industry Mean)		
	Panel Data	a Regression: N=1989, Adj.R-3	Sq=0.645.
	Central Gov. Supervised	Provincial Gov. Supervised	Lower Gov. Supervised
Appointment	0967	.0663	2176
	(-1.28*)	(.233)	(-1.68**)
Autonomy	.0304	.471	203
	(.276)	(2.46***)	(-2.41**)
Incentive	0.000392	0.00296	.00140
	(.497)	(1.37*)	(1.70**)
Party	262	372	.148
	(-3.57***)	(-2.20**)	(1.02)
SelectionDummy	.1484	.216	.078
	(2.86***)	(1.25*)	(.739)

Table 2: The Costs of Government Control: State Enterprises' Non-Economic Behavior

Notes: 1) Appointment is 1 if the director was appointed by the government and it is 0, otherwise; Autonomy is the percentage of the enterprise's output sold to the market; Incentive is the ex ante contractual percentage of marginal pro⁻t retention; Party is 0 if the director is also the ⁻rst- or second- secretariat of the Communist Party Committee in the enterprise and it is 0, otherwise; SelectionDummy=1 if in one or two years, either Appointment=0 or Party=0 and it is 0, otherwise;

2) Please refer to Equation (2) and (3) for model speci⁻cation;

3) Heteroskedastic-consistent t-statistics are in parentheses. *, **, and *** represent 10 percent, 5 percent, and 1 percent signi⁻cant levels, respectively; 4) The instrumental variables used in the ⁻rst regression are: duration of the managerial contract; whether the director is a college graduate; whether the director thinks bonus is an important motivation for his e[®]orts; and initial economic conditions of the enterprise when the director is appointed.

	Percentage of Responses by Directors to the Question:				
	\Why Do You Make Unpro⁻table Products?"				
	\Not Impt"	\Important"	\Very Impt"	Score	Ranking
\Forced"	31.3	23.5	24.8	1.53	0.692
\Lack of Tech."	36.0	33.1	12.7	1.40	0.627
\Subsidy"	40.4	19.8	11.9	1.16	0.600
\Employment"	20.8	31.8	30.4	1.76	0.675
Weight	1	2	3		

Table 3: Direct Evidence on Causes of Pro⁻t Losing

Note: 1) The complete description of the choices are: \Forced"=\forced by the government"; \Lack of Tech."= \lack of technology"; \Subsidy=\according to current government policies, we bene⁻t from producing these products"; \Employment" = \in order to provide jobs for surplus workers;"

2) Enterprises directors were asked to evaluate each choice (\Forced", ...) by using a mark, such as: \Not important" ...

3) The Score is de⁻ned as each choice's weighted average mark across all enterprises, with the reported weight in the table;

4) The Ranking is the frequency that an enterprise director gave a choice the highest mark among all choices (ties were possible).

	Regression I: Does Compensation/ Worker Increase			
	When the Enterprise's Real Value-Added Decreases? (Yes=1)			
	Probit Regression: N=1494, Freq(Yes)=0.252.			
	Central Gov. Supervised	Provincial Gov. Supervised	Lower Gov. Supervised	
Appointment	316	879	268	
	(803)	(-3.10***)	(-3.24***)	
Autonomy	00396	00139	00207	
	(-1.36*)	(474)	(-2.08**)	
Incentive	00240	00867	00227	
	(6318)	(-1.89**)	(-1.65*)	
Party	141	200	497	
	(473)	(807)	(-6.80***)	
SelectionDummy	.2555	.801	.141	
	(.819)	(2.89***)	(1.86**)	
	Regression II: Does Compensation/Worker Increase when			
	Tax+Pro ⁻ t+Interest Is Lower? (Yes=1)			
	Probit R	egression, N=1501, Freq(Yes)	=0.260.	
	Central Gov. Supervised	Provincial Gov. Supervised	Lower Gov. Supervised	
Appointment	0827	751	260	
	(199)	(-2.78***)	(-3.19***)	
Autonomy	00429	00106	00173	
	(-1.33*)	(404)	(-1.78*)	
Incentive	00109	00667	00190	
	(271)	(-1.60*)	(-1.38*)	
Party	226	197	461	
	(701)	(828)	(-6.43***)	
SelectionDummy	.254	.627	.142	
	(.786)	(2.43***)	(1.92**)	

Tahla 1. Tha Rana	ts of Covernment Cont	rol Doducod Agoncy Costs

Notes:

1) Appointment is 1 if the director was appointed by the government and it is 0, otherwise; Autonomy is the percentage of the enterprise's output sold to the market; Incentive is the ex ante contractual percentage of marginal pro⁻t retention; Party is 0 if the director is also the ⁻rst- or second- secretariat of the Communist Party Committee in the enterprise and it is 0, otherwise; SelectionDummy=1 if in one or two years, either Appointment=0 or Party=0 and it is 0, otherwise;

2) Please refer to Equation (4) for model speci-cation;

3) T-statistics are in parentheses. *, **, and *** represent 10 percent, 5 percent, and 1 percent signi⁻cant levels, respectively.

	Dependent Variable: Gross Rate of Return to Capital		
	Panel Data Regression: N=2735, Adj.R-Sq=0.553.		
	Central Gov. Supervised	Provincial Gov. Supervised	Lower Gov. Supervised
Appointment	0564	.0172	0189
	(-1.56*)	(.304)	(-1.93**)
Autonomy	000364	.000331	000272
	(-1.47*)	(.719)	(-1.80*)
Incentive	000446	.000485	.000220
	(-1.71*)	(1.83**)	(1.50*)
Party	0278	00471	00187
	(-1.38*)	(-1.43*)	(642)
SelectionDummy	.00316	.0161	.0167
	(.185)	(.955)	(2.90***)

Table 5: The Net E[®]ect of Government Control on Enterprise E[±] ciency

Notes: 1) Appointment is 1 if the director was appointed by the government and it is 0, otherwise; Autonomy is the percentage of the enterprise's output sold to the market; Incentive is the ex ante contractual percentage of marginal pro⁻t retention; Party is 0 if the director is also the ⁻rst- or second- secretariat of the Communist Party Committee in the enterprise and it is 0, otherwise; SelectionDummy=1 if in one or two years, either Appointment=0 or Party=0 and it is 0, otherwise;

2) See equation (5) for econometric model speci⁻cation;

3) T-statistics are in parentheses. *, **, and *** represent 10 percent, 5 percent, and 1 percent signi⁻cant levels, respectively.

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