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## **Why Do Governments Dump State Enterprises? Evidence from China<sup>1</sup>**

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## **Abstract**

Why do governments choose to dump state enterprises by privatization or liquidation? Existing research on privatization has not paid much attention to this question. The paper focuses on testing two alternative theories of the issue. One theory explains that governments privatize or liquidate state enterprise in order to enhance efficiency. The other theory explains that increasing government revenue or stopping subsidies to profit-losing state enterprises is the motivation. Our tests based on a data set from China reject the efficiency theory and yield support for the revenue theory. In addition, we find evidence that the concerns for unemployment and for losing political benefit of control to the government are important obstacles of privatization or liquidation decisions. A simple implication is that it might be sensible to propose second-best privatization or liquidation programs that take government objectives into account and are feasible with the government rather than first-best programs that will not be implemented.

## **1. Introduction**

Should governments privatize state-owned enterprises? What is the impact of existing privatization programs? These are important research questions that have motivated an enormous amount of economic research during the past decade. According to a few recent literature surveys (Djankov and Murrel, 2000 and Megginson and Netter, forthcoming, and Toninelli, 2000), the accumulated research seems to have converged on the view that privatization is critical to reform state-owned enterprises and many of the implemented privatization programs have had positive impact on enterprise performance. Thanks to this research, our knowledge on these important questions has greatly improved.

But, why do governments choose to privatize state-owned enterprises? More generally, why do governments choose to part with, or, dump, state enterprises by either transferring their ownership to private hands or liquidating state enterprises? In many ways, these are even more important and relevant questions than the opening questions that have generated the huge privatization literature. After all, there are no obvious reasons to believe that in reality governments faithfully follow economists' advice on major economic policy issues such as privatization. Policy makers often seem to have their own considerations and agenda. With a better understanding of why governments (do not) choose to privatize, the obstacles to efficiency-enhancing privatization might be identified and resolved and our economic analysis of privatization can be put to better use.

Unfortunately, there has been very limited literature on why governments choose to dump state enterprises, although one can identify a few general streams of thinking on this issue. In some cases, there is limited formal research along each of the streams, especially empirical research.

The first group of general theories argue that governments dump state enterprise in order to enhance enterprise efficiency. In fact, most theoretical research on privatization simply starts from this premise and derive various predictions. Underlying this thinking is the belief that somehow, the political market place is efficient and the equilibrium of the political game is economically efficient. In a larger context, Glaeser, Johnson and Shleifer (forthcoming) call this the Coasian theory of institutions. But why in reality, there seems to be a common phenomenon that many efficiency enhancing privatization programs fail to be implemented due to government objections? At least, we need empirical tests of such theories of government decisions of privatization.

The second line of thinking explains that governments dump state enterprises in order to enhance their revenue rather than efficiency.<sup>2</sup> Privatization or liquidation of state enterprise may bring in sales revenues to the government in some cases. Privatization may also increase the future flow of tax revenue when the efficiency of the privatized enterprises increases high enough and tax enforcement is strong enough. Finally, in the case of profit-losing state enterprises, privatization or liquidation of such enterprises relieves governments of the burden of financial subsidies. In the Chinese context, Cao, Qian, Weingast (1999) argue that governments privatize due to facing harder budget constraints. However, without enterprise level data, they cannot directly test this hypothesis. Using a data set of China's township and village enterprises, Brandt, Li, and Roberts (2001) find that when local banks face tighter liquidity constraint, it was more likely that local collective enterprises were privatized. It is interesting to test this line of thinking against the first one.

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<sup>2</sup> Under a set of strict conditions, including perfect capital market, non-distortionary taxes, and fully competitive product market, maximizing privatization revenue or tax revenue government tax revenue or stopping financial losses is equivalent to maximizing social efficiency. We certainly do not think these conditions are satisfied in economies of our concern.

The third line of thinking is that governments dump state enterprises as a strategic move in political games. For example, it is often suggested that reformist politicians in Eastern Europe and the former Soviet Union chose mass privatization in order to secure political support for further reforms. (See for example, Shleifer and Triesman, 2000) In the context of Western Europe, it might be that conservative parties in power use privatization or liquidation of state enterprises in order to weaken labor unions and therefore the political basis of the labor party of social democrats. For example, Biais and Perotti (1998) model how a right-wing government can use mass privatization to get reelected. Plausible as it is, this line of explanation of the motivation of privatization has yet to put systematic empirical tests.

The purpose of the paper is to fill in the gap of the literature by empirically testing competing theories on why governments dump --- i.e., privatize or liquidate --- state enterprises. We are able to do so thanks to a unique data set of Chinese state enterprises, in which some were privatized or liquidated while the rest remained to be state enterprises. The focus of the test is on the first two groups of theories of government motivations of privatization, since in the Chinese context, political moves are often covert and we do not have reliable information on them. However, we are able to estimate the relative level of the political benefit of control to the government with state enterprises.

In order to facilitate the test, we first set up a simple theoretical model that is general enough to incorporate various explanations as special cases. We then derive predictions of the simple model linking them to the hypothesized government preference. Empirical estimations of the underlying parameters provide us with inferences on government preferences and therefore yield tests of different theories of why government privatize.

Our simple model of privatization is based on a bargaining game between a government and the workers of the state enterprise. The government is assumed to have a general objective function consisting of the enterprise's efficiency, revenue contribution, and the political benefit of control to the government. The issue of the burden of financial subsidies to poor performing state enterprises is also modelled by allowing the government treating negative revenue asymmetrically from positive revenue. The workers care about employment (or unemployment) and total wage. Privatization or liquidation of state enterprise may cause changes in efficiency, total revenue to workers and the government, employment and the political benefit of control of the government. These changes are anticipated by both parties when they negotiate the decision of privatization or liquidation so that the equilibrium takes these factors into account.

The simple model predicts when privatization or liquidation is implemented based on the underlying parameters of the government objective function as well as changes to the state enterprise due to privatization. By testing this prediction against observed data of privatization, we are able to estimate the parameters of government objective function and therefore test different theories of privatization.

The empirical tests reject the efficiency theory while yield support for the revenue theory. It shows that none of the alternative measures of efficiency increases has predictive power with regard to the privatization or liquidation decision. On the other hand, increases in revenue to the government are important in predicting the decision. In particular, a significant factor inducing the privatization or liquidation decision is delayed loan and interest payment *when it becomes a financial burden to the government*. That is, delayed loan and interest payment alone is not important. Moreover, other things being equal, the more surplus workers and the higher political benefit of control to the government from the enterprise, the less likely for the state enterprise to be privatized or

liquidated. Overall, the main message of the tests is that governments dump state enterprises not for the purpose of increasing efficiency but for enhancing tax revenue or for relieving themselves of the financial burden of subsidizing profit losing state enterprises.

In the following, Section 2 of the paper describes the simple model of privatization and its predictions. Section 3 explains the design of the empirical tests and measurement of variables. Test results are presented in Section 4 and the last section summarizes the paper with discussions on some policy implications.

## **2. A Simple Model of Privatization**

Two parties are most critical in the privatization decision of a state enterprise and the model focuses on them. The first is the government agency, which is in control of the senior managers of a state enterprise. The government agency and the senior managers of an SOEs who are government officials can be viewed as one entity and have important decision rights in privatizing of the state enterprise. The other party is the workers, who have been offered long-term employment by the state enterprise and can demand compensation when they become unemployed. For simplicity, we assume that both parties have to agree before a privatization decision can be made.

To be general, we suppose that the government may be concerned with three possible objectives associated with an enterprise: economic efficiency of the enterprise, revenue contribution from the enterprise to the government, and political benefit of control from the enterprise. The possible concern for efficiency comes from the government's desire to seek the society's economic prosperity. The preference for tax revenue is often argued

to be common among bureaucrats of various kinds. Finally, government officials derive political benefit of control from direct control of a state enterprise as many have illustrated (e.g., Kornai (1980, 1992) ). The general preference of the government is the same regardless of whether a state enterprise is privatized or not. But each of the entries in the objective function may change after privatization. In particular, the political benefit of control is supposed to be zero when the firm is private. We assume the relative weight on each of the three elements to be  $\hat{\alpha}$ ,  $\hat{\alpha}$ , and 1, respectively. We can write the objective function of the government as:

$$W_G = \hat{\alpha}e + \hat{\alpha}T + B, \quad (1)$$

Where,  $e$  is a measure of economic efficiency of the enterprise (whether it is state owned or privatized);  $T$  is the equivalent of per period revenue the government gets and  $B$  is the political benefit of control which is zero when the private is private.

A potentially important factor we need to model is the so-called soft budget constraint, which refers to the phenomenon that state enterprises expect to be bailed out when in financial difficulties. An alternative way to interpret the soft budget constraint is that the government tolerates negative revenue  $T$  from the operation of the enterprise. The opposite of the soft budget constraint is the hard budget constraint, which makes the government feel extra pain with negative  $T$  and therefore is likely to make changes in the operation of the enterprise rather than passively subsidize the enterprise. Based on this analysis, we introduce an extra term to expression (1) to capture the softness of the budget constraint:

$$W_G = \hat{\alpha}e + \hat{\alpha}T + \hat{\alpha}_s D(T)T + B, \quad (2)$$

where,  $D(T)=1$  if  $T<0$  and  $D(T)=0$  otherwise. The coefficient  $\hat{\alpha}_s$  is meant to capture the phenomenon of the soft budget constraint. The lower the value of  $\hat{\alpha}_s$ , the softer the



budget constraint. Intuitively,  $\hat{\alpha}_s$  is the extra pain a one unit of loss of profit causes to the government.

Turning to workers' objective, we focus on two of their main concerns. First, they are concerned with layoffs. Second, other things being equal, an increase in total wage bill benefits all workers. Thus, a reduction in employment must be compensated by an increase in total wage bill paid to the same group of worker in the form of wage and unemployment compensation. Let the size of employment be  $L$  and the per period wage bill be  $W$  and the relative weight on them be 1 and  $\tilde{\alpha}$ , respectively. We write down the objective function of the workers as:

$$W_L = L + \tilde{\alpha} W. \quad (3)$$

An interpretation of the objective of the workers is that if the privatization results in the layoff of one worker, then the extra compensation paid to the worker must be  $\tilde{\alpha}$ .

We are now ready to analyze the conditions under which privatization may occur. Obviously, such a decision is an outcome of negotiations between the government and the workers and compensations from the government to workers may be necessary. Suppose that  $M$  is monetary equivalent of the monthly perpetual amount of transfer from the government to workers in order for the latter to agree to privatization.

In order for the workers to agree to such a plan of privatization, it must be:

$$\Delta W_L = \Delta L + \tilde{\alpha} (\Delta W + M) > 0, \quad (4)$$

where, the differences are taken between the value of privatization and no privatization.

At the same time, the government must also find privatization to be worthwhile, i.e.,

$$\Delta W_G = \Delta e + \hat{\alpha} (\Delta T - M) + \hat{\alpha}_s \Delta [D(T)T] + \Delta B > 0. \quad (5)$$

Multiply (4) by  $\hat{\alpha}$  and (5) by  $\tilde{\alpha}$  and adding up the two multiplied inequalities, we have

$$\hat{\alpha} \tilde{\alpha} \Delta e + \hat{\alpha} \Delta L + \hat{\alpha} \tilde{\alpha} (\Delta W + \Delta T) + \tilde{\alpha} \hat{\alpha}_s [\Delta D(T)T] + \tilde{\alpha} \Delta B > 0. \quad (6)$$

We define

$$R = W + T,$$

which is the total amount of cash flow of the enterprise that can be divided among government and workers. Condition (6) can be rewritten as

$$\alpha \tilde{\Delta} e + \hat{\alpha} \tilde{\Delta} L + \hat{\alpha} \tilde{\Delta} R + \tilde{\alpha} \hat{\alpha}_s [\tilde{\Delta} D(T) T] + \tilde{\alpha} \tilde{\Delta} B > 0. \quad (7)$$

We make two assumptions to further simplify condition (7). First, we assume that after privatization, there is no need for the government to bear negative loss of the enterprise, i.e.,  $T$  is always positive after privatization. We use  $T_s$  to denote the value of government revenue collection from state enterprises. Second, the political benefit of control to the government after privatization is 0. We denote the political benefit of control associated with state enterprises be  $B_s$ . (7) can be simplified as:

$$\alpha \tilde{\Delta} e + \hat{\alpha} \tilde{\Delta} R - \tilde{\alpha} \hat{\alpha}_s D(T_s) T_s + \hat{\alpha} \tilde{\Delta} L - \tilde{\alpha} B_s > 0. \quad (8)$$

A simple interpretation of condition (8) is that in order for a state enterprise to be privatized, a combination of the efficiency gain, the increase in cash flow  $R$ , and the pre-privatization profit-loss must be high enough to overcome the combination of layoff of workers and the loss of political benefit of control of the government. Another way to interpret condition (8) is to look at the impact of government and workers' preferences on the privatization decision. Other things being equal, a higher  $\alpha$ , i.e., government putting more weight on efficiency, makes privatization more likely to happen, since  $\tilde{\Delta} e$  is positive. When  $\tilde{\Delta} R + \tilde{\Delta} L$  is positive, i.e., when the increase in cash flow from privatization is sufficient to compensate layoff of workers so that a surplus is left for the

government, a higher  $\hat{\alpha}$  also makes privatization more likely to happen. Finally, so long as  $\tilde{\alpha}$  is not zero, a higher  $\hat{\beta}$ , i.e. a harder budget constraint, makes privatization more plausible.

Notice that condition (8) is general enough for us to test various hypotheses of why privatization was implemented. Although we may not be able to identify each of the parameters of  $\hat{\alpha}$ ,  $\hat{\beta}$ , and  $\tilde{\alpha}$ , we will be able to estimate the coefficients on each of the variables of  $\Delta e$ ,  $\Delta R$ ,  $D(T_S)$ ,  $T_S$ ,  $\Delta L$ , and  $B_S$ . The hypothesis that efficiency gain is a cause of privatization can be tested by estimating the coefficient of  $\Delta e$ ; the estimated coefficients of  $\Delta R$  and  $D(T_S)$  are basis for testing the hypotheses that increasing revenue or hardening the budget constraint is a cause of privatization, respectively.

### **3. The Data and Design of the Empirical Tests**

#### **3.1. The Data Set**

The data set we use is based on three surveys of several hundreds of Chinese state enterprises covering the period of 1980-1999. The first survey was conducted in 1990 by a research team consisting of economists from the Chinese Academy of Social Sciences (CASS), Oxford University, and the University of Michigan. The survey has information on 769 state enterprises from 1980 to 1989. The second survey was implemented in 1995 by researchers from the CASS and the University of Michigan and collected information on the same group of enterprises from 1990 to 1994. Of the original 769 sample enterprises, 680 remained valid in the second survey. The third survey was sponsored by a consortium of researchers from mainland China, Hong Kong, and the U.S. and carried out in early 2000 and obtained information retrospectively on the sampled enterprises from 1994 to 1999 (with overlapping information of 1994 for the purpose of quality

control). Putting all three surveys together, we have a data set of a substantial number of China's state enterprise throughout the twenty years of reform.

The sample of the enterprises came from four provinces and five sectors and represented mostly manufacturing firms. Unlike surveys of the state enterprises conducted by government agencies, the two surveys were carefully designed and pilot tested by economics researchers. The data set contains detailed information on the operations and financial information of the SOEs in the sample. It also contains qualitative information from the senior managements of the SOEs. The first part of the dataset was widely used in studies such as Groves, et al (1994 and 1995) and Li (1997).

What makes our empirical test possible is that in the third enterprise survey conducted in 2000, about 200 of the original sample of 680 "disappeared", i.e., these enterprises no long existed at the time of survey by early 2000. Subsequently, the survey team made major efforts in finding out what happened to most of these enterprises. It turned out that the majority of these former state enterprises were either privatized or liquidated, i.e., "dumped" by their supervising government agencies. The rest, of course, were still state enterprises but were merged with other state enterprises and therefore disappeared from the sample.

The dumped state enterprises fell into two large categories: privatization and bankruptcy/liquidation. There were several cases of privatization, including selling to a private individual (often, the chief manager) or private enterprise, merging with a township and village enterprise (TVE), and take-over by a foreign enterprise. Figure 1 provides a break down of the major categories of the cases.

(Insert Figure 1 Here)

About the dumped state enterprises, the survey team could not get as detailed information about their operation after the ownership change as that before the change. The survey provides information on when the identity change happened, who bought the ownership shares of the enterprise (when relevant), and what happened to the workers (in many but not all cases).

### 3.2. The Design of the Econometric Test

Our empirical tests follow closely the theoretical model as summarized in inequality (8). Let  $y_i$  be the dependent variable which is equal to 1 if enterprise  $i$  was dumped by the government between 1995 and 2000; otherwise it is 0. In our empirical tests, we do not distinguish the two sub-categories of privatization and bankruptcy/liquidation, since the theoretical model is applicable to both cases. Our econometric model is:

$$\text{Prob}\{y_i = 1\} = \text{Prob}\{\hat{\alpha} \hat{\Delta} e_i + \hat{\alpha} \hat{\Delta} R_i - \hat{\alpha} \hat{\Delta} D(T_{Si}) T_{Si} + \hat{\alpha} \hat{\Delta} L_i - \hat{\alpha} \hat{\Delta} B_{Si} + \varepsilon_i > 0\}, \quad (9)$$

where, all the variables are the same as those explained before and the error term  $\varepsilon_i$  is introduced due to omitted variables that we cannot observe. We assume that the error term follows a normal distribution. Due to the wide variations in the size of enterprises in the sample, it is unreasonable to assume that the error term has the same standard deviation across different enterprises. Instead, we believe that for larger firms, the privatization decision invokes more considerations not captured by the model. Therefore, we assume that the error term for large firms has larger standard deviation than small firms. In particular, we assume that the standard deviation of the error term is proportional to the labor force of the firm. This means that in the actual implementation, we divide all of the independent variables by the size of the employment of the enterprise.

### 3.3. Measurement of Variables

The dependent variable  $y_i$  is 0 for enterprises that remained to be state enterprises by early 2000, including those that were merged by another state enterprises.  $y_i$  is equal to 1 if the  $i$ -th enterprise had been either privatized or bankrupt or liquidated by 2000 --- corresponding to categories 3 to 8 in Figure 1. From the point of view of the theory, both cases are the same, representing the situation that the government decided to get rid of the control of the enterprise.

We measure the efficiency gain  $\Delta e_i$  in two alternative ways. First, we use an estimated increase in the gross rate of return on total assets of the enterprise after the identity change, whether it is actual or counterfactual. The gross rate of return on total assets is defined as the total amount of value added of the enterprises, which is available to pay wage and bonus, taxes, bank interest, etc., divided by total value of the asset. Unfortunately, we do not have data on the gross rate of return for those privatized state enterprises. Neither do we have observations on the counterfactual cases of privatization for those unprivatized state enterprises. Fortunately, in the last survey conducted in 2000, we also have a sample of about 300 non-state enterprises. We calculated the average rate of return on assets for industry groups of these firms and use the averages as that for privatized state enterprises. That is,  $\Delta e_i$  was constructed as the difference between the industry average gross rate of return on assets of non-state enterprises and that of state enterprises from 1990 to 1994.

Alternatively, we measure  $\Delta e_i$  by potential increases in labor productivity when a privatized enterprise lays off those surplus workers while maintaining the same production level as before. In the surveys, enterprise managers provided information on the maximal amount of workers that could be laid off without affecting current production of the enterprise. In the case of liquidation, we still calculate the index. Under the assumption that productive workers (not including surplus workers) of the

liquidated enterprise are transferred to a similar production facility in the same industry, the index also captures the potential productivity increase.

$\ddot{A}R_i$ , which is the increase in total cash flow of the enterprise due to privatization or liquidation, cannot be fully observed in the data set due to the lack of information on the operation of privatized enterprises. By definition,  $\ddot{A}R_i$  is not a measure of social welfare or social efficiency gain, since it only affects the welfare of the government and workers. For example, cutting a surplus worker does not change  $\ddot{A}R_i$ , since the saved wage bill for the government comes from the same amount of loss of the affected worker. Cutting a surplus worker does increase social efficiency as capture by  $\ddot{A}e_i$ .

In order to implement the econometric model, we partially parameterize  $\ddot{A}R_i$ . We assume that  $\ddot{A}R_i$  consists of two parts, observed and unobserved. The observed part is based on the information of how the enterprise was losing profit before its potential identity change. The data set describes the percentage of the output that is losing profit. It is reasonable to assume that after being privatized or liquidated, the enterprise will sell the part of the asset that produces such outputs. The value of the assets, which is assumed to be proportional to the profit losing output, constitutes part of the source of enhanced revenue for the government and workers. Using an interest rate of 5%, we convert the one time increase in cash flow to perpetual increase in cash flow and define this as  $S_i$ . Moreover, through other channels, the privatization can also increase the total amount of cash flow for the government and workers to share. Not being able to observe it, we suppose it is proportional to the total value of the remaining asset. The proportion depends on observed attributions of the enterprise before being privatized, such as which industry the enterprise is in and how much reform it had implemented as a state enterprise. In summary, we assume:

$$\ddot{A}R_i = S_i + (a_1 \text{ industry}_1 + a_2 \text{ industry}_2 + \dots + a_j \text{ industry}_j + b_1 \text{ reform}_1 + \dots + a_R \text{ reform}_R) A_i + \eta_i$$

where,  $S_i$  is immediate and observable cost saving obtainable through privatization or liquidation;  $a_1 \text{ industry}_1 \dots$  are industry dummies;  $\text{reform}_1 \dots$  are reform dummies pre-privatization;  $A_i$  is the value of asset of the enterprise;  $\eta_i$  is the error term due to omitted variables, which is assumed to follow normal distribution with standard deviation proportional to employment of the enterprise (an index of enterprise size), since for larger firms the estimation formula is likely to be disproportionately inaccurate.

$T_i$ , which is the negative cash flow of the state enterprise born by the government before privatization or liquidation, is estimated by two alternative methods. The first alternative is using the average negative profit plus sale tax incurred by the enterprise three years 1992—1994. The other alternative is the total accumulated delayed bank loan and interest payment, which is a measure of accumulative poor financial performance. The advantage of using delayed bank loan and interest payment is that this reflects a longer run problem than negative profit.

After using each of these variables in the regressions, we also redo the regressions by multiplying them by an index of how much burden the poor performance of the enterprise had created for the government. We call this  $sbc_i$ , which takes a value of 0, if the manager of the state enterprise said that he did not get any help from the government in the case of dealing with delayed payment of bank loan. This is a case in which accumulated financial loss had not become a problem for the government. The value of  $sbc_i$  is 4 if the manager answered that he had obtained most important help from the government on the issue. It take a value of 1 or 2 or 3 in the intermediate cases. The higher the value of  $sbc_i$ , the more burden the government felt facing each unit of financial loss of the enterprise.



$\Delta L_i$ , which is the reduction in employment due to the privatization or liquidation of the state enterprise (thus, it is mostly negative), can be calculated based on observed variables. For each case of privatization and liquidation, the survey has specific information on what happened to the workers, e.g., a certain percentage of workers were transferred to a unemployment agency and a certain percentage of workers were provided with new employment in the privatized enterprise. For those enterprises without identity changes, we use the total number of surplus workers as a proxy of  $\Delta L_i$ , since those workers would most likely be cut had the state enterprise be dumped.

Finally, for the political benefit of control associated with a state enterprise,  $B_i$ , we again have to parameterize due to the inability to observe. We suppose that  $B_i$  depends on the pre-privatization size of employment, total value of fixed asset, the level of supervising government agency (central, or, provincial, or, county). That is, we assume

$$B_i = c_1 L_i + c_2 V_i + c_3 \text{Central}_i + c_4 \text{Province}_i + c_5 \text{County}_i + \rho_i$$

Where,  $L_i$  is employment;  $V_i$  value of fixed asset;  $\text{Central}_i, \dots$ , are government level dummies; and  $\rho_i$  is the error term due to omitted variables, which we assume to have standard deviation proportional to the size of employment.

In summary, we estimate the following Probit regression:

$$\begin{aligned} \text{Prob}\{y_i=1\} = \text{Prob}\{ & \alpha + \beta \Delta L_i + \hat{\alpha} [ S_i + (a_1 \text{industry}_1 + a_2 \text{industry}_2 + \dots + a_j \text{industry}_j \\ & + b_1 \text{reform}_1 + \dots + a_R \text{reform}_R) A_i ] - \hat{\alpha} \hat{\beta} D(T_{Si}) T_{Si} + \hat{\alpha} \Delta L_i - \hat{\alpha} ( c_1 L_i + c_2 V_i + c_3 \\ & \text{Central}_i + c_4 \text{Province}_i + c_5 \text{County}_i ) + \delta_i > 0 \}, \end{aligned} \quad (10)$$

Where,  $\delta_i$  is the combined error term which still follows a normal distribution with standard deviation proportional to the size of the enterprise, which we index by the size of employment.

#### 4. Results of the Empirical Test

Among the 681 sample enterprises, 122 were either privatized or liquidated any time between 1995 and 2000. The rest remained to be state enterprises (see Figure 2 for details). Comparing the two groups of sample enterprises, a major difference is size. Among those privatized or liquidated, about 4% were large enterprises, while 27% of those remaining state enterprises were large enterprises. This is consistent with the government policies of “let go the small and medium and grab tight the large”, which has been implemented since the early 1990’s with regard to state enterprise reform. Our test takes this into account.

(Insert Figure 2 Here)

Table 1 lists the summary statistics of the independent variables. Several patterns are noticeable. Total employment, value of output, and fixed asset value are bigger for an average remaining state enterprise than those of a privatized or liquidated enterprises. Likewise, the same pattern holds for the variables such as change of employment, delayed loan payments, and total wage bill of surplus workers. However, the difference in the latter set of variables between the two groups of sample enterprises is proportionately much less than those of the former set of variables. Intuitively, using one of the former sets of variables as weight, a regression using the latter group of variables should provide predicative powers. This is the statistical essence of the test results, which we explain below.

(Insert Table 1 Here)

The estimation results of the Probit regressions are given in Table 2. There are a

few consistent findings across the regressions. First, the results show that efficiency, whether measured by increases in the rate of return on assets or by improvements in labor productivity, is not a significant factor in the decision of privatization or liquidation. Second, the variables measuring changes in available cash flow for the government and workers are mostly positive and statistically significant, supporting the hypothesis that the privatization or liquidation decision is driven by increasing government revenue. Third, although the total delayed loans plus interest payments is not statistically significant, it becomes significant when multiplied by the index of the burden of financial subsidies, which is 0 if the enterprise obtained no help from the government in dealing with loan payment and 4 if it received the most important help from the government. In other words, the accumulated debt per se is not a cause pushing for privatization or liquidation. But, when a high level of bad debt becomes a major financial burden to the government, it is effective in inducing the privatization or liquidation decisions of the government. Finally, the regressions show that the larger the unemployment associated with privatization or liquidation, the less likely the government dumps the state enterprise, as the coefficients on the unemployment term is negative and statistically significant.

(Insert Table 2 Here)

How economically significant are the variables in affecting the decision of privatization or liquidation? Table 3 calculates the increases in the probability of privatization or liquidation due an increase those statistically significant variables. It shows that a one standard deviation increase in layoff due to privatization or liquidation decreases the probability of privatization or liquidation by 57% to 61%. A similar change in total assets used in unprofitable production increases the probability by 8% to

10%. Similar changes in delayed loan and interest payment multiplied by the index of the burden of subsidies increases the probability by 3 to 5%.

(Insert Table 3 Here)

## **5. Concluding Remarks**

The enormous amount of literature on privatization has mostly focused on the question of whether and how governments should privatize state enterprises as well as the impact of existing privatization programs. We argue that an equally important question is why in reality governments (do not) choose to dump state enterprise through privatization or liquidation. The lack of research on this question leaves us with three general theories, explaining that governments dump state enterprises in order to maximize economic efficiency, government revenue, and political benefits, respectively.

Utilizing a panel data from China, in which some state enterprises were dumped and others remained to be state enterprises, we are able to test the efficiency and revenue theories of why governments privatize or liquidate state enterprises. The tests reject the efficiency theory and provide support for the revenue theory. In addition, the findings reveal that the motive of getting rid of the financial burden of subsidizing poor performing state enterprises is important. Moreover, we find that avoiding unemployment and losing governments' political benefits of control of state enterprises are important considerations preventing privatization or liquidation decisions.

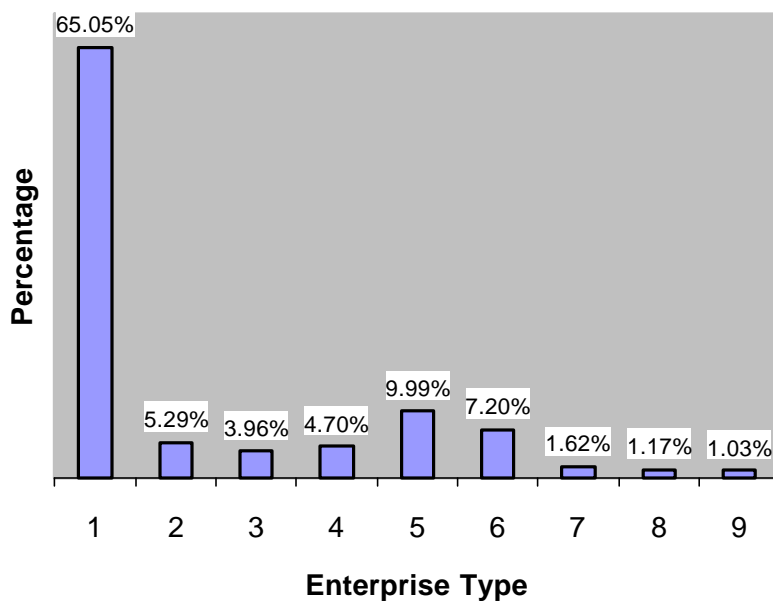
Although the empirical tests are based on the Chinese experience of privatization, it seems that that findings of the paper are general enough to have a simple policy

implication. On privatization issues, economists tend to propose the first-best programs, aiming at maximizing social efficiency. However, the findings in the paper show that in reality the key decision maker, the government, takes revenue maximization as an objective and is concerned with unemployment. First-best programs are often blocked by the government. Therefore, in order for a privatization program to be feasible, it might be sensible to advocate second-best programs of privatization or liquidation programs that take government concerns into account while enhancing social efficiency. For example, reform programs privatizing state enterprises for revenue and restricting post-privatization labor shedding might be more appropriate in a context like the Chinese economy than others with giving away shares and unrestricted lay off.

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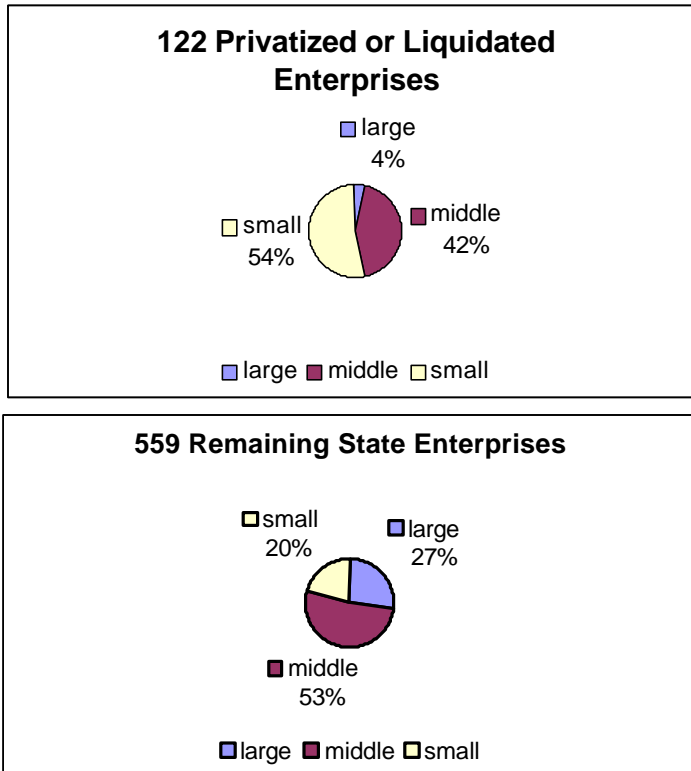
**Figure 1 All 681 Enterprises Types Distribution**



- Notes:*
- 1: state-owned enterprises without ownership changes;
  - 2: state-owned enterprises merged or acquired by other state-owned enterprises;
  - 3: state-owned enterprises acquired by foreign invested firms;
  - 4: state-owned enterprises acquired by urban collective enterprises;
  - 5: state-owned enterprises that were liquidated;
  - 6: state-owned enterprises in bankruptcy procedures;
  - 7: state-owned enterprises auctioned or leased out;
  - 8: state-owned enterprises that become share-holding cooperatives;
  - 9: state-owned enterprises disappeared and could not be identified.

We treat cases 3 to 8 as privatization or liquidation.

**Figure 2** The Sample Distribution





**TABLE 1: SUMMARY STATISTICS OF REGRESSION SAMPLE**

Unit: 10,000 RMB (wherever applicable)

Privatized or Liquidated Enterprises	Mean	Std.Dev
The difference in the rate of return on assets with/without privatization	0.07	0.28
Labor productivity improvement by cutting surplus labor	0.54	0.57
The difference in total employment with/without privatization	-234	1049
Total assets used in unprofitable production	583.5	2871.4
Delayed loans and interest payment	133.14	365.49
(Index of the burden of subsidies)*(Delayed loan and interest payment)	318.78	854.64
Profit loss	75.90	105.65
(Index of the burden of subsidies)*(Profit loss)	130.59	236.06
Total employment pre-privatization	822	1039
Total output pre-privatization	1781.66	3600.84
Net fixed asset pre-privatization	913.76	1438.9
Number of observations		122
Remaining State Enterprises		
The difference in the rate of return on assets with/without privatization	-0.07	0.26
Labor productivity improvement by cutting surplus labor	1.56	11.35
The difference in total employment with/without privatization	-641	1192
Total assets used in unprofitable production	1076.39	3474.93
Delayed loan and interest payment	241.90	1006.94
(Index of the burden of subsidies)*(Delayed loan and interest payment)	450.10	1904.59
Profit loss	96.66	261.81
(Index of the burden of subsidies)*(Profit loss)	146.73	466.08
Total employment	2214	3740
Total output	10633	32217
Net fixed asset	5363.9	22309
Number of observations		559

**Table 2** Heteroscedastic Probit Regressions: The Determinants of State Enterprises Privatization or Liquidation Decisions

	Dependent Variable= 1, if privatized or liquidated; 0, otherwise							
	Regression 1		Regression 2		Regression 3		Regression 4	
The difference in the rate of return on assets with/without privatization	193.20	(1.64)			178.59	(1.45)		
Labor productivity improvement by cutting surplus labor			0.95	(0.19)			1.34	(0.26)
The difference in total employment with/without privatization	1.37***	(4.38)	1.42***	(4.56)	1.32***	(4.18)	1.28***	(4.05)
Corporatization reform dummy	0.11	(0.69)	0.12	(0.75)	0.11	(0.69)	0.13	(0.79)
Mining and utility industry	0.04	(0.21)	-0.03	(-0.13)	0.08	(0.35)	0.02	(0.08)
Light manufacturing industry	0.24	(1.32)	0.22	(1.27)	0.27	(1.45)	0.27	(1.46)
Chemical industry	-0.22	(-1.04)	-0.25	(-1.18)	-0.24	(-1.09)	-0.24	(-1.11)
Heavy manufacturing industry	0.01	(0.07)	-0.006	(-0.03)	0.05	(0.29)	0.06	(0.35)
Enterprise size dummy	0.30***	(2.58)	0.33***	(2.77)	0.33***	(2.79)	0.36***	(3.01)
Total assets used in unprofitable production	0.11*	(1.86)	0.12**	(1.98)	0.05	(0.81)	0.04	(0.65)
Delayed loan and interest payment	-0.47	(-1.35)	-0.48	(-1.37)				
(Index of the burden of subsidies)*(Delayed loan and interest payment)	0.35**	(2.26)	0.35**	(2.29)				
Profit loss					-0.82	(-0.79)	-0.37	(-0.39)
(Index of the burden of subsidies)*(Profit loss)					0.93*	(1.88)	0.86*	(1.78)
Total employment pre-privatization	-0.37**	(-2.15)	-0.29*	(-1.73)	-0.39**	(-2.22)	-0.38**	(-2.15)
Total output pre-privatization	-0.16***	(-4.38)	-0.18***	(-4.81)	-0.15***	(-4.02)	-0.16***	(-4.25)
Net fixed asset pre-privatization	-0.34*	(-1.81)	-0.31*	(-1.73)	-0.39**	(-2.03)	-0.39**	(-2.05)
Central government dummy	-67.10	(-0.27)	-88.27	(-0.36)	-74.77	(-0.31)	-72.05	(-0.30)
Province government dummy	-328.55**	(-2.14)	-318.44**	(-2.14)	-370.02**	(-2.43)	-364.83**	(-2.47)
City government dummy	-58.8	(-0.58)	-70.83	(-0.70)	-84.57	(-0.84)	-93.26	(-0.93)
Constant	417.09***	(3.91)	400.32***	(3.75)	443.86***	(4.21)	429.15***	(4.07)
Number of observations		652		657		652		651
R-square		0.2889		0.2864		0.2842		0.2824

Note: we assume the standard deviation of the error term is proportional to size of employment;  
z-ratios are in parentheses. (\*\*, \*\*\*) indicate significance at the 10(5, 1) percent level, respectively.

**Table 3** Increases in the Probability of Privatization or Liquidation due to Increments in Independent Variables

	Probability change under standard normal distribution assumption			
	Regression 1	Regression 2	Regression 3	Regression 4
The difference in total employment with/without privatization	0.6127	0.5901	0.5962	0.5732
Enterprise size dummy (from large to small or medium)	0.0002	0.0001	0.00005	0.00005
Total assets used on unprofitable production	0.0827	0.1042		
(Index of the burden of subsidies)*(Delayed loan and interest payment)	0.0555	0.034	0.0493	0.0405
Total employment pre-privatization	-0.0663	-0.0441	-0.0758	-0.061
Total production value pre-privatization	-0.0681	-0.0466	-0.0774	-0.0621
Net fixed assets pre-privatization	-0.0681	-0.0466	-0.0774	-0.0621
Province government dummy (from having a non-provincial to a provincial supervising government agency)	-0.0388	-0.0275	-0.0475	-0.0391

Notes: 1) Omitted are those independent variables which are not statistically significant;

2) Except for the dummy variables, the amount of increase in all independent variables is one standard deviation of the variable.