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Privatization and Managerial Efficiency

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Privatization and Managerial Efficiency[*]

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Preliminary and incomplete

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Abstract

We investigate the privatization decision of a government whose objectives are to preserve jobs and to stabilize its budget. The firm considered needs restructuring, i.e.some funds must be provided and the manager must undertake an effort to reorganize the firm. If the productivity of the manager is unknown to the government, privatization involves a trade-off between better managerial incentives and a loss of control: productive managers restructure since they receive the profits of the firm, but unproductive managers shirk and deviate the funds to unproductive uses. This gives rise to a soft budget constraint, and the preservation of employment may become more expensive to the government than in state ownership.

1 Introduction

Privatization has been on the agendas of many OECD countries since the early 80's. In recent times, it has gained additional attention as a main building block of transformation strategies of former centrally planned economies towards the market. While there is a considerable amount of empirical work on privatization the most comprehensive of which is Megginson, Nash and van Randenborgh (1994), there is little theoretical work on privatization and no generally accepted paradigm.

While the few existing models (briefly discussed at the end of this Introduction) impose a considerable amount of structure on the objectives of and the relationship between government and managers, our starting point is the more general notion of political capture that may affect both government and managers. As will become clear below, our set-up allows us to undertake a step towards a positive analysis of privatization which, as of now, is not available in the literature.[1]

Consider an economy where the median voter is conservative, i.e. exclusively interested in the stabilization of the state's budget. However, both managers and governments are - to potentially different extent - captured by the interests of workers in a firm, i. e. they receive some private benefits if and only if high employment is preserved. While the potential capture of governments by the interests of specific groups of the population is a standard feature of positive economic theories of the state, political capture of managers has not been considered by the literature. The assumption is, however, supported by the existence of strong trade unions, worker councils, or employee-owners as, for instance, in Russia and many other transition countries that have applied insider-privatization schemes.

The most interesting results of our model stem from the comparison of the following two situations in both of which the interests of the government and the manager are not aligned. In the first one, the government is captured to a large extent by workers' interests, while the manager's rents are small. In the second situation, the government is mainly interested in the stabilization of its budget, but managers are captured to a large extent by the interests of workers in their firm. We analyze the effect of privatization on the choice of *employment level* in the firm, on *managerial incentives*, and

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[1] An exception is Laffont and Meleu (1997) who offer a positive theory of privatization in a very specific framework, namely for infrastructure in subsaharan Africa.

on the *government's budget* in these two situations. We show that: first, privatization leads to less inefficient employment in the first situation, but leads to more excess employment in the second one; second, privatization always leads to better managerial incentives in the first situation, but it may distort managerial incentives in the second one; third, privatization always has positive effects on the government's budget in the first situation, but it has always negative effects in the second one.

The results are derived in the following framework. A state-owned enterprise (SOE) in need of restructuring requires two inputs: the government injects some new capital into the firm, and the manager is supposed to work hard in order to reorganize the firm; this effort is unverifiable. If both inputs are provided, the profitability of all workers increases such that no worker needs to be fired. If managers do not work hard, the firm can only be run profitably if some labour is shed. Both the level of employment in the firm and the use of the funds within the firm are assumed to be unverifiable and are hence controlled by the owner of the firm. In the beginning of the game, the government decides whether to keep cash-flow and control rights or to privatize the firm, i.e give the ownership rights at a price of zero to the wealth-constrained incumbent manager whose disutility of effort ("productivity") is private information.

The transfer of ownership rights involves a fundamental tradeoff between incentives and the loss of control: On one hand, residual claimancy provides productive managers with stronger incentives to restructure than state ownership; on the other hand, since the government loses control rights over the funds injected into the firm, unproductive managers may shirk and deviate the capital initially provided for unproductive uses. This gives rise to a soft budget constraint in the sense of Dewatripont and Maskin (1995), since the government does not want to lose the employment in the firm, and consequently refinances the firm. Here, the preservation of employment becomes more expensive than in state ownership.

Some intuition of the results follows. *Employment:* In the first situation, unprofitable ("excess") employment is kept in state ownership (the government has large rents), but cut down in private ownership since the manager does not want to forego profits due to a workforce that is too large. In the second one, the government's main objective is stabilization, and consequently, it cuts employment unless the manager works hard, while in private ownership the high-rent manager prefers to finance the losses of the firm to cutting down employment.

In our model, as in most of the literature on incomplete contracts in the tradition of Grossman and Hart (1986), the allocation of ownership right does not only affect the distribution of ex post surplus, but also ex ante *incentives*. In the first situation, the government cannot give the manager any incentives to work hard in an SOE, since the manager does not benefit from profits and he is not exposed to any danger of losing his rents. Here, the only way to incite the manager to work hard is to give him residual claimancy. In the second situation, however, the government has a credible threat to cut down employment of an SOE unless the manager restructures. This threat provides the manager with some (negative) incentives that may even be stronger than the (positive) incentives in private ownership. In those cases in which privatization does raise the incentives of managers to work hard, the transfer of cash-flow rights from the government to the manager involves an interesting, counterintuitive effect. Though it increases on average the incentives of managers to undertake effort, it reduces by the same token the incentives of the government to behave efficiently, i.e. not to subsidize firms. Given that part of the losses are financed by the private manager, the government's costs associated with preserving excess employment in privatized firms decrease, and the government is less tough with private firms than with SOE's.

Budgetary effects of privatization: In the first situation and state ownership, no manager restructures and the government must finance the losses due to excess employment. In private ownership, productive managers restructure and pay back the loan initially provided by the government, while unproductive ones receive additional subsidization which raises the monetary costs of privatization. If the incentive effects are, however large enough, the overall budgetary effects of pivatization are positive. In the second situation, an additional effect arises. A proportion of managers in the SOE restructures and the government receives the profits of the firm. While in private ownership, restructuring always involves net budgetary costs due to the loss of control, keeping firms in state ownership stabilizes the budget since the government cashes in net profits of restructuring firms.

The model allows to derive some positive conclusions on the privatization decisions of governments, a question that has remained unresponded to by the literature on privatization. Two main lessons should be stressed. First, we can identify sufficient conditions such that ideological considerations are of second order for the decision to privatize. In particular, if firms are highly profitable and managers are highly skilled, privatization dominates state ownership independently from the degree to which the government is captured

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by the interest of workers. However, if this is not the case, the trade-offs analyzed above may induce both high and low rent-type governments to keep the firm in state ownership. The second lesson is that privatization and stabilization may be contradicting goals for a government, since the loss of control and cash-flow rights may inflate the budget deficit, especially if managers or other potential buyers are wealth-constrained, and firms must hence be privatized through give-away schemes. This result corroborates Bolton and Roland's (1992) intuition that rapid privatization by give-aways may put pressure on the budget, and appears to be supported by recent developments in Russia and the East german privatization scheme (see the Conlusion for a brief discussion).

Our paper relates to a small body of literature that is based on Sappington and Stiglitz (1987) irrelevance result: in a world of complete contracts ownership does not matter. The subsequent literature and our model analyzes privatization in frameworks of incomplete contracts. Two arguments are brought forward. First, managers in state-owned enterprises (SOE's) may not have sufficient incentives to work hard, due to commitment problems of *benevolent* governments. In Laffont and Tirole (1993) the government cannot commit itself not to deviate an investment made by a manager to uses that are efficient from the viewpoint of society as a whole, but inefficient on the level of the firm. This expropriation threat reduces the ex ante incentives of the manager to undertake the investment. Privatization assures that the interests of owners and managers are better aligned, but involves multi-principal costs. In Schmidt (1996), the manager of a regulated firm is assumed to enjoy rents as increasing function of the quantity of the good sold to the government. Here, the benevolent government has no commitment to penalize the manager in high costs states of the firm. Privatization is assumed to reduce the information available to the government. The resulting informational rents that must be paid to shareholders of the firm distort the quantities of inefficient firms downwards and hence act as a commitment device for the government to be tough with the manager whose incentives to reduce costs are consequently increased.

The above papers have been critized by Shleifer and Vishny (1994) for first, the methodological approach that puts much weight on the effects of alternative information structures and not the allocation of control rights, and second, lacking realism. They assume that governments are *malevolent* [see also Shapiro and Willig (1990)], i.e. do not maximize the welfare of the society but are captured by the interests of particular groups. Here, the

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allocation of control rights crucially affects the relationship between the government and firms. Privatization may "depoliticize" enterprises, since the government's interventions into the conduct of the firm become more expensive, given that private managers must be fully compensated for the losses due to these interventions. While it seems appealing to analyze privatization in a positive framework, the paper of Shleifer and Vishny (1994) does suffer from the *ad hoc* hypothesis of a "decency constraint" which imposes an upper bound on the subsidies the government can pay to the manager. Moreover, the model provides no explanation at all why a malevolent government would like to privatize, given that it can only lose from the transfer of ownership rights to a manager but never gain. Our model takes Shleifer and Vishny's critique of the first group of papers into account, but explicitly analyzes under what conditions governments may want to privatize.

In what follows, we present the model (Section 2), derive the main results in varying situations of political capture of the government and the manager, respectively (Section 3), discuss briefly alternative ownership forms (Section 4), and conclude.

2 The model

In this section, we present the general set-up of the model. First, we describe the restructuring process of the firm; second, we derive the importance of private versus state ownership from the assumption of some contractual incompleteness; third, we discuss the objectives of the government and the manager; finally, we introduce the timing of the game and the payoffs of the players.

2.1 The restructuring process

The government (G) and a manager (M) are involved in the restructuring process of an initially state-owned enterprise (SOE). The firm needs *financial restructuring* in order to acquire new know-how and machinery. We assume that only G can provide the funds needed and that it is willing to do so. Furthermore, *managerial effort* is needed in order to reorganize the firm and to develop new, competitive products.

The restructuring process has three possible outcomes. First, without financial restructuring the firm remains *unrestructured* and both M and G end

up with a zero payoff. Managerial effort alone has no effect on the enterprise, and will consequently never be undertaken unless the firm is also financially restructured. Second, if financial restructuring takes place but is not accompanied by managerial effort, the enterprise is only *partially restructured* and it depends on the size of employment whether or not the firm can be run in a profitable way. Employing its initial level $\overline{L}$, the firm makes losses $\Pi_0(\overline{L}) \in [-1, 0]$; when employment is cut down to $\underline{L}$, the firm generates a profit $\Pi_0(\underline{L}) \in [1, 2]$. Third, if both financial restructuring and managerial effort takes place, the firm is *completely restructured*, and generates a profit of $\Pi_e(\overline{L}) \geq \Pi_0(\underline{L}) + 1$; subscripts e and 0 indicate whether or not the manager has worked hard in order to restructure.

The assumptions concerning the profitability of the firm in its three states discussed above are based on the following considerations. Labour is assumed homogenous; in the unrestructured firm, the marginal productivities of all workers are negative. The injection of capital renders labor more profitable. But, without managerial effort, the marginal productivity of a proportion of the workers $\Delta L \equiv \overline{L} - \underline{L}$ remains negative, and the losses that are due to this excess employment more than outweigh the profits that are generated by the group $\underline{L}$ of workers whose marginal productivity is positive. In a completely restructured firm, all workers can be employed in a profitable way, and no labor needs to be shed. As will become clear below, the fact that completely restructured firms need not reduce their employment and the assumption that $\Pi_e(\overline{L}) \geq \Pi_0(\underline{L}) + 1$ together assure that the government will have no incentive to intervene in the conduct of such a firm, and that productive managers have no incentive to behave opportunistically.

2.2 Contractual assumptions and the importance of ownership

In a world of complete contracts, the government could for all possible states of nature specify how the funds should be used, and how many people should be employed. If such contracts involve very high transaction costs, the allocation of *control rights* between the government and the manager becomes crucial for the course the restructuring process takes. A second incompleteness relates to managerial effort the consequences of which, i.e. the state of the enterprise, is assumed to be observable but non-verifiable. Consequently, the government cannot write incentive contracts with the manager that link

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an effort level with some specified payment. Hence, the main way to provide managers with restructuring incentives is to transfer the *cash-flow rights* to them.

We assume that G is a "strong" government in two senses. First it can commit itself not to renationalize the firm once restructured; second, it is when the firm is state-owned capable to control the correct use of the funds injected in the firm (and it choses its prefered level of employment). Through privatization, G gives both cash flow and control rights over restructuring funds and employment in the firm to the incumbent manager (the "insider"). Put differently, privatization involves some loss of control for the government.

Notice that in a world with perfect capital markets, G could chose other forms of privatization than the give-away to insiders. For instance as in Shapiro and Willig (1990), an auction could be setup the outcome of which would be efficient matching between managers and assets and extraction of all managerial rents. This mechanism can, however, not be implemented if managers are wealth-constrained, and banks may be unwilling to lend money to managers since the risk of strategic default is high. Here, giving the firm to the insider manager may be the only privatization option available. As experience in transition countries shows, political constraints may provide another rationale for insider privatization. Governments may seek support by influential directors of SOE's by "bribing" them through insider privatization [cf. Boycko, Shleifer and Vishny (1994) for this argument]. Notice finally that by considering insider privatization we abstract from agency problems between shareholders and managers, which could reduce the desirability of privatization. While for the time being, we assume that control and cash-flow rights can only be transfered as a package, we briefly discuss alternative ownership in Section 4 where we allow for separable control and cash-flow rights.

2.3 Political capture, the government and the manager

Assume that the median voter is only interested in budgetary stabilization but that G is captured by the interests of workers and consequently trades off two interests. First, it wants to stabilize its budget, i.e. it is interested in the cash-flows of the firm and wants to minimize subsidies to the firm. Second, G derives some political benefits B if high employment is preserved in the firm; but, if employment is reduced, the government loses this benefit. The size of B thus represents the degree to which the government is captured by

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the particular interest of workers. We assume that $B \in [1.2)$, i.e the political benefit of high employment has more value than one unit of capital, but the government would *ex ante* not be willing to inject two units of capital in order to save high employment.

The possible capture of governments by the interest of workers is a standard feature of positive economic theories of government. A second element that has received less attention in the privatization literature[2] is that managers need not exclusively be interested in profit-maximization, but may enjoy rents asssociated with the size of the firm. We assume that M derives some rent $E \in [0,2)$ associated with high employment in the firm, a proxy of the size of the firm.

These rents can be interpreted in Jensen's (1986) sense, i.e. managers may be "empire-builders". Especially in the former Soviet Union, housing, cars, or vacation facilities, are a substantial source of managerial rents. A second interpretation is that managers may be conservative in the sense of Aghion, Dewatripont and Rey (1996), i.e. they dislike the introduction of new technologies or the reorganization of their firm as such. We will follow another interpretation: especially in transition countries (but not exclusively there), managers may be captured or constrained by the interest of workers in their firm. As the case of Victor Chernomyrdin shows, managers of large industrial conglomerates may be interested in political influence which is increasing in the employment represented by the respective firm. Moreover, powerful worker collectives, who are often by the same time majority shareholders of the firms may have an important say in the decisions of managers [cf. Aghion and Blanchard (1996)]. As will become clear in the analysis of the model, the relative size of managerial rents compared to the rents of the government will be essential for the privatiztion decision of the government.

2.4   Timing and payoffs

Initially, the enterprise is state-owned and employs $\overline{L}$ workers. The productivity of the manager, represented by a disutility factor ψ is unknown to the government. If managers work hard, they incur disutility ψ which is uniformly distributed over the interval $[0, \overline{\psi}]$; if they shirk they incur no costs. In what follows we will call managers who work hard "productive", while those who shirk will be labeled "unproductive". It will become clear below that

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[2]An exception in this respect is Schmidt (1996).

whether or not a manager with a given productivity is productive depends on ownership and the parameters of the model. The government possesses two units of capital one of which is provided for the financial restructuring of the firm. By the same time, the government decides whether or not to privatize the firm, at a price of zero. The ownership decision of the government cannot be influenced by the manager; the structure of the game, however, assures that under privatization the manager can never lose but will probably gain compared to the status quo. When the firm is being privatized, M and G sign a contract that commits M to pay back the funds that are injected in the firm, once profits are realized. These profits are verifiable by a court.

In what follows we describe the timing of the game after the government's ownership decision; payoffs are presented in Table 1 and Table 2 and are discussed below.

State ownership

1. Nature draws the type of the manager.

2. M decides whether to work or to shirk, and G assures that the capital initially injected is used for restructuring purposes.

3. After having observed the state of the firm (either completely or partially restructured), G decides on whether or not to reduce employment in the firm.

4. Payoffs are realized.

The payoffs in state ownership are straightforward: if M restructures, he receives his rents net of the disutility of effort. The government receives its rent and the firm's profit net of the money sunk for restructuring purposes (payoffs $\#e_G$, e_M in Table 2). If M has not restructured, he cannot influence the government's employment decision since he is wealth-constrained. Consequently, according to its preferences G choses high or low employment and the respective payoffs $\#f$ and $\#g$ are realized.

Private ownership

1. Nature draws the type of the manager.

2. M decides on the use of the capital that G has injected. Either he uses it for the restructuring of the firm and works, or he keeps the money "in his pocket" and shirks. If M has worked, the firm is completely restructured, otherwise it remains unrestructured.

3. If the manager has shirked, he can either take the money and run, or ask G for an additional unit of capital. Subsequently, M decides on the level of employment.

4. Payoffs are realized.

Privatization does not only affect the payoffs both parties receive at the end of the day, but through the allocation of control rights also determines the possible actions G and M can take. In stage 2, M may restructure and receive the profits of a fully restructured firm and his private benefit net of the government's loan and his disutility of effort. In this case, G receives its private benefit (payoffs #a_G, a_M in Table 1). If M decides to deviate the funds that G has injected in the firm (an option which is not possible in an SOE where G controls the use of the funds) he can take the money and run, and the government has lost one unit of capital (payoffs #b). Alternatively, M can ask G for an additional unit of capital, the use of which for restructuring purposes is controlled by the government at this stage[3]. If G refinances (otherwise G and M receive payoffs #b) and M choses $\overline{L}$, both M and G receive their rents that are associated with high employment, M finances the losses $\Pi_0(\overline{L})$ out of the funds he has initially received, and G has lost both units of capital injected into the firm (payoffs #c). If M choses to cut down employment, he must pay the resulting profit $\Pi_0(\underline{L})$ to the state since profits are verifiable and the manager ows two units of capital to the government. Here, he just keeps the money he has initially received (payoffs #d).

Nptice that an option that does not occur in equilibrium is that M could ask for refinancing and restructure subsequently, i.e. the structure of the game assures that the incentive constraint of productive managers is satisfied. Here, M has nothing to gain compared to immediate restructuring, since he must pay back both units of capital. In particular, if waiting implies an ε cost,

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[3] If G does not have the opportunity to control the use of the funds once it knows that the manager is unproductive and M has low rents, G does not refinance and the firm is liquidated. This involves a welfare loss of $\Pi_0(\underline{L}) - 1$, but does not affect the results in a considerable way.

immediate restructuring becomes a strictly dominant strategy for productive managers.

Table 1: Payoffs in private ownership

	a) compl. restr.	b) liq.	c) part. restr., $\overline{L}$	d) part. restr., $\underline{L}$
G	B	-1	$B - 2$	$\Pi_0(\underline{L}) - 2$
M	$\Pi_e(\overline{L}) + E - \psi - 1$	-1	$\Pi_0(\overline{L}) + E + 1$	1

Table 2: Payoffs in state ownership

	e) compl. restr.	f) part. restr., $\overline{L}$	g) part. restr., $\underline{L}$
G	$\Pi_e(L) + B - 1$	$B + \Pi_0(L) - 1$	$\Pi_0(\underline{L}) - 1$
M	$E - \psi$	E	0

3 Analysis

We solve the game by backward induction: in the first step, we derive G's employment decisions if the enterprise is state-owned, and M's decision in a privatized firm. In 3.2, we derive cut-off disutility levels beyond which M shirks. By comparison of these levels in the two ownership forms, the incentive effects associated with privatization are determined. In 3.3, the budgetary effects of privatization are analyzed. Finally, we ask under what conditions the government will privatize a firm, given the effects on employment and the budget as analyzed before.

3.1 Employment decisions

State ownership: In stage 3 of the game, G decides on employment. While it is, by assumption, always optimal for G to keep high employment in a fully restructured firm, G choses $\overline{L}$ if $B \geq \Delta\Pi_0$, and $\underline{L}$ if $B < \Delta\Pi_0$. Put in words, G preserves (cuts) excess employment in a partially restructured firm if its political benefit associated with high employment is large (small) relative to additional profits that are generated by the respective employment cuts. Notice that if $B < \Delta\Pi_0$, the government sheds employment, although keeping excess employment may increase the joint pay-off of G and M (if $E + B \geq \Delta\Pi_0$). However, since M has no liquidity, he cannot bribe G to keep excess employment.

In the remainder of the paper we will label a government that preserves employment in a partially restructured firm *"employment-maximizing"*. A government that cuts down employment will be labeled *"budget-stabilizing"*.

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Private ownership: By inspection of payoffs (b), (c) an (d) of Table 1 it becomes clear that in stage 3 of the game, M always asks for refinancing, and G always accepts, since both players cannot lose compared to liquidation. Hence, compared to state ownership the loss of control associated with the privatization of the firm gives raise to soft budget constraints as in Dewatripont and Maskin (1995). M keeps $\overline{L}$ if $E \geq -\Pi_0(\overline{L})$, and cuts down employment to $\underline{L}$ otherwise. Proposition 1 summarizes the effects of privatization on excess employment, compared to state ownership.

Proposition 1 *a) Privatization leads to labour-shedding if $B - \Pi_0(\underline{L}) \geq -\Pi_0(\overline{L}) > E$;*

b) excess employment is preserved irrespective of ownership if both $B - \Pi_0(\underline{L}) \geq -\Pi_0(\overline{L})$ and $E \geq -\Pi_0(\overline{L})$;

c) excess employment is cut down irrespective of ownership if both $B - \Pi_0(\underline{L}) < -\Pi_0(\overline{L})$ and $E < -\Pi_0(\overline{L})$;

d) privatization leads to more inefficient employment if $E \geq -\Pi_0(\overline{L}) > B - \Pi_0(\underline{L})$.

Proposition 1 shows that whether or not privatization leads to less inefficient employment depends on first, the effects of excess employment on the firm's profitability, and second, on the relative importance of B to E. If, as in cases b) and c), G's and M's interests are sufficiently aligned, employment decisions are not affected by ownership. While in these cases the relative size of M's to G's rents is irrelevant, it becomes crucial in cases a) and d). Case a) is equivalent to the one proposed by Shleifer and Vishny (1994). Here, the manager's objective is maximization of profits, while the government is seeking to preserve excess employment. As in Shleifer and Vishny, privatization leads to labour-shedding.

The opposite is true in case d) where the government is captured to lesser extent by the workers' interest than the manager. Such a situation may emerge when the government is subject to some external control, e.g. through the IMF, but the manager faces strong trade unions, worker collectives, or - as in the case of Russia - workers who control large parts of the firm's shares. In this situation, the government cuts down employment in an SOE if the manager does not restructure, since the budgetary effects associated with excess employment are larger than the respective political benefit. Through privatization, however, the basic trade-off between stabilization and preservation of jobs is altered. Here, G can assure B at lower costs than in

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state ownership, namely at the expense of an additional unit of capital, while the losses are financed by M with the help of the funds initially injected into the firm. In the following subsection we discuss how this affects managerial incentives.

3.2 Managerial incentives in private and state ownership

We now analyze the decision of a manager to undertake effort for the four cases identified in Proposition 1. M compares his payoffs with and without effort, given his knowledge about the employment decisions taken later, and his payoffs that are associated with them. This comparison leads to some cut-off disutility levels (for each ownership form in each case) beyond which the managers shirks. By comparing these payoff levels, we obtain conditions under which privatization has positive incentive effects.

In case a), for instance, the manager's payoff in *private ownership* is $\Pi_e(\overline{L}) - 1 + E - \psi$ if he works. If he shirks, he receives 1. Comparing the two payoffs and rearranging, we derive $\psi_a^p = \Pi_e(\overline{L}) - 2 + E$, where subscripts p and a represent private ownership in case a). In *state ownership*, M does not undertake any effort irrespectively of his productivity. This is due to the fact that G preserves excess employment in both a partially and fully restructured firm. Undertaking effort hence only has costs for M, but no benefits. Carrying out the same simple operations for all cases we obtain Table 3. The following Proposition summarizes the results on the incentive effects of privatization.

Table 3: Cut-off disutility levels

Case	Private ownership	State ownership
a)	$\psi_a^p = \Pi_e(\overline{L}) - 2 + E$	$\psi_a^s = 0$
b)	$\psi_b^p = \Pi_e(\overline{L}) - \Pi_0(\overline{L}) - 2$	$\psi_b^s = 0$
c)	$\psi_c^p = \psi_a^p = \Pi_e(\overline{L}) - 2 + E$	$\psi_c^s = E$
d)	$\psi_d^p = \psi_b^p = \Pi_e(\overline{L}) - \Pi_0(\overline{L}) - 2$	$\psi_d^s = E$

Proposition 2 *Privatization has positive effects on managerial incentives, i.e. the proportion of managers who restructure increases due to privatization, in cases a), b) and c) (defined according to Proposition 1). In case d), however, privatization has a positive effect on managerial incentives if and only if $\Pi_e(\overline{L}) - \Pi_0(\overline{L}) - 2 > E$.*

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While the first part of Proposition 2 is in line with the conventional wisdom that transfering cash flow rights to managers improves their incentives, the second part of the proposition points out that managerial incentives may be stronger in state ownership than in a manager-owned firm. In case d). G cuts down excess employment when the manager shirks, and M loses his rents. Here, G possesses a credible threat that makes productive managers work hard in order not to lose their rents as a consequence of the reduction of the firm's workforce. An interesting interpretations of this fact is that managers may work hard if their interests are aligned to a large extent with the one of workers or if they want to signal their productivity to the labour market [cf. Roland and Sekkat (1996)], and if the state is committed not to bail out firms that do not restructure. The effects of hard budget constraints for SOE's on managerial restructuring effort is supported by empirical findings for SOE's in Poland [cf. Pinto (1995)].

Whether or not these *negative incentives* are stronger than the positive incentive that is given to the manager through residual claimancy depends on the profitability of a fully restructured firm. If $\Pi_e(\overline{L})$ is sufficiently large, privatization assures better managerial incentives. For those firms in which restructuring effort does not affect the profitability of the firm in a substantial way, however, state ownership is better from an incentive point of view (if the government is budget-stabilizing).

A corollary of Propositions 1 and 2 is that privatization of industries in which restructuring has only small effects on the profitability of a firm, but managers are to a large degree captured by the interests of workers may have adverse incentive effects on the government. Here, the government loses its incentives to behave efficiently, i.e. to reduce the workforce, since residual claimancy is transfered to the manager. Moreover, these managers anticipate that they will be bailed out and consequently lose their incentives to work hard. Hence, if privatization decisions are taken globally, and not according to the profitability of restructured firms, the transfer of cash-flow rights from G to M improves the incentives of managers in profitable industries, but for less profitable industries, both the government's and the managers' incentives to behave efficienctly are reduced.

3.3 Budgetary effects of privatization

Consider the financial flows that may take place between G and M. Fully restructured private firms pay back their loans and no additional subsidiza-

tion occurs. Unproductive managers, however, shirk and ask for additional subsidies. In state ownership, the state controls the use of funds, and hence no refinancing occurs. But, since managerial incentives are [except for case d)] weaker in SOE's than in private firms, there is less restructuring and G must finance the losses due to excess employment. On the other hand, G can cash-in the profits of partially restructured firms in which employment is cut down, and receives the profits of fully restructured SOE's.

Let $\alpha_{pi} \equiv \psi_i^p / \overline{\psi}$ the probability that a manager undertakes effort in private ownership in case i, and α_{si} be defined in analogous way for state ownership. The net budgetary effects of privatization can be determined in a straightforward way. In case c) and private ownership, for instance, the net flows from G to the firm are $(1 - \alpha_{pc})[\Pi_0(\underline{L}) - 2]$; α_{pc} represents the proportion of managers who pay back their loan. In state ownership, the Government receives $\alpha_{sc}[\Pi_e(\overline{L}) - 1] + (1 - \alpha_{sc})[\Pi_0(\underline{L}) - 1]$. The amount is positive, since the first term represents the profits net of the initial subsidy of a fully re-structured firm, while the second term represents the respective profits of a partially restructured firm in which employment is cut down. Table 4 compares the financial flows between G and M in the four cases. Subsidies are negative, net profits of state owned firms that are transfered to the government are positive. The flows are presented in reduced form, i.e. substituting for the respective α_{pi}, α_{si}. Proposition 3 compares the budgetary effects of privatization in the four cases. The respective statements are easily derived by comparing the respective flows in Table 4.

Table 4: Financial flows between G and M

Case	Private ownership	State ownership
a)	$\frac{[\Pi_0(\underline{L}) - 2][\overline{\psi} - \Pi_e(\overline{L}) + 2 - E]}{\overline{\psi}}$	$-1 + \Pi_0(\overline{L})$
b)	$\frac{-2[\overline{\psi} - \Pi_e(\overline{L}) + \Pi_0(\overline{L}) + 2]}{\overline{\psi}}$	$-1 + \Pi_0(\overline{L})$
c)	$\frac{[\Pi_0(\underline{L}) - 2][\overline{\psi} - \Pi_e(\overline{L}) + 2 - E]}{\overline{\psi}}$	$\frac{\Pi_0(\underline{L}) - 1 + E[\Pi_e(\overline{L}) - \Pi_0(\underline{L})]}{\overline{\psi}}$
d)	$\frac{-2[\overline{\psi} - \Pi_e(\overline{L}) + \Pi_0(\overline{L}) + 2]}{\overline{\psi}}$	$\frac{\Pi_0(\underline{L}) - 1 + E[\Pi_e(\overline{L}) - \Pi_0(\underline{L})]}{\overline{\psi}}$

Proposition 3 *Privatization has the following effects on the state's budget: case a): positive; case b): positive if and only if the incentive effects of privatization are sufficiently large; cases c) and d): negative.*

In case a), all private managers pay back at least some part of their loan, while in state ownership there are no repayments. In case b) there is a tradeoff

between the positive incentive effects associated with the transfer of cash-flow rights, and the arising soft budget constraint that is associated with the loss of control. Privatization is good for the budget if the proportion of restructuring managers is sufficiently large, i.e. if either $\Pi_e(\overline{L})$ large or managers have on average good skills ($\overline{\psi}$ small). In cases c) and d), an additional element must e considered. Here, a proportion of state managers restructure, and in those SOE's that do not, the government cuts down employment and receives net profits. Through privatization, the government loses residual claimancy, and only receives repayments from those managers who restructure. Here, the net budgetary effect of privatization is always negative.

This part of the Proposition confirms Bolton and Roland's (1992) intuition that give-away schemes may actually be bad for the state's budget. Recent experience in Russia confirms this point of view; the rapid give-away to insiders has resulted in some pressure on the budget. While unprofitable firms still receive substantial transfers from the state, privatization of profitable firms and inefficient taxation technologies have lead to a compression of revenues.

3.4 The Government's decision to privatize

By comparison of the government's pay-offs in state and private ownership we derive V_i, the government's value associated with privatization in case $i = \{a, b, c, d\}$:

$$V_a = \alpha_{pa}B + (1 - \alpha_{pa})(\Pi_0(\underline{L}) - 2) - B + 1 - \Pi_0(\overline{L})$$
$$V_b = \alpha_{pb}B + (1 - \alpha_{pb})(B - 2) - B + 1 - \Pi_0(\overline{L})$$
$$V_c = \alpha_{pc}B + (1 - \alpha_{pc})(\Pi_0(\underline{L}) - 2) - \alpha_{sc}(\Pi_e(\overline{L}) + B - 1) - (1 - \alpha_{sc})(\Pi_0(\underline{L}) - 1)$$
$$V_d = \alpha_{pd}B + (1 - \alpha_{pd})(B - 2) - \alpha_{sd}(\Pi_e(\overline{L}) + B - 1) - (1 - \alpha_{sd})(\Pi_0(\underline{L}) - 1)$$

Substitution of α_{pi} and α_{si} and inspection of the partial derivatives of the model allows to analyze the government's decision whether or not to privatize. Proposition 4 summarizes our results (proofs are available on request).

Proposition 4 *The value of privatization always increases in $\Pi_e(\overline{L})$, decreases in $\overline{\psi}$ and decreases (or is constant) in $\Pi_0(\overline{L})$. There is some $\Pi_e(\overline{L})$ large enough or a $\overline{\psi}$ small enough such that $V_i > 0, \forall i$. Furthermore:*

E increases the value of privatization in case a), does not affect it in case b), and decreases it in cases c) and d);

B decreases the value of privatization in case a), does not affect it in case b), and increases it in cases c) and d);

$\Pi_0(\underline{L})$ *increases the value of privatization in case a), does not affect it in case b), and decreases it in cases c) and d).*

Proposition 4 states that if the incentive effects of privatization are large enough, i.e. if managers are on average well skilled and/or restructured firms are very profitable, privatization always dominates state ownership. The reason is that if most managers restructure and pay back their loan, the benefits of privatization outweigh the costs that are due to a small proportion of managers who do not restructure, and to the loss of cash-flow rights for G.

If, however, the proportion of restructuring managers is not large enough, it depends on the other parameters whether or not the government wishes to privatize. Decreasing losses of partially restructured firms, $\Pi_0(\overline{L})$ reduce the government's incentives to privatize. Increasing managerial rents E enforce the government's incentive to privatize in case a), since here, they further strengthen the incentive of private managers to restructure, while in SOE's managers know that employment will not be reduced even if they do not restructure, and hence they do not have to fear the loss of their rents. In cases c) and d) the opposite is true. Here, the government has a credible threat to cut workforce as long as the enterprise is state-owned; the possible loss of their rents incites managers to work harder.

Increasing B (within the boundaries defined by the respective cases) reduces the incentives of the govenment in case a), since here privatization leads to less employment, while it increases the propensity to privatize in case c) and d) where privatization leads to higher employment than state ownership. The last part of the proposition is due to the fact that in case a), the government receives $\Pi_0(\underline{L})$ as a partial reimbursement of the loans given to a privatized firm, while in cases c) and d), the government receives the cash-flows of a partially restructured firm in which employment was cut down. Consequently, in the first case, increasing $\Pi_0(\underline{L})$ increases the government's willingness to privatize while in the other cases it reduces the incentives to privatize because more cash-flows are lost.

As a corolary of Proposition 4, it can be established that there may be a tradeoff between the volume of privatization and budgetary stabilization.

Proposition 5 *Depending on the parameters of the model, governments that are more prone to stabilization may have less incentives to privatize.*

As discussed before, decreasing B is, ceteris paribus, tantamount to assuming that stabilization is becoming more important for the government. One can easily show that privatization and stabilization may be both strategic complements and substitutes. The idea of the proof is simple: we compare cases a) to c), and cases b) to d), respectively. In order to derive a measure for the volume of privatization, we set the respective V_i to zero and solve for $\Pi_e(\overline{L})$. By comparing the profitability levels needed for privatization, it an be shown that employment-maximizing goverments (a and b) may want to privatize more than budget-stabilizing governments (c and d).

4   Alternative ownership forms

So far, we have only allowed for a joint transfer of cash-flow and control rights from the government to the manager. In what follows we investigate the effects of two alternative ownership forms. We follow Shleifer and Vishny in their definitions. In a *corporatized* firm, the state remains residual claimant, and the manager receives control rights. In a *regulated* firm, the state stays in control of the restructuring funds and decides on employment, but managers receive the cash flow.

It is straightforward that corporatization cannot lead to higher managerial effort than either full privatization or state ownership. The reason is that managers are neither subject to (positive) profit incentives, nor to negative incentives through the menace of losing their rents if they do not restructure. Indeed, in a corporatized firm, managers do not internalize the consequences of their actions (or, more precisely, of their idleness). Moreover, since managers control employment and the money initially given to the firm, a soft budget constraint arises. Corporatization thus combines the disadvantages of the pure ownership forms.

The question is thus: may regulation combine the advantages of the pure forms? Regulation can be analyzed along the same lines as private and state ownership. In what follows we briefly describe the main features of regulation; an exhaustive analysis is available on request.

G's employment decision. Since the government does not give up its control rights, there is no refinancing in regulation, i.e the firm is for sure at least partially restructured. In such a firm, G wants to keep excess employment, since it does not benefit from the firm's profits and $B > 1$. However, since the manager has no cash, the government must finance the losses due to excess

employment. Hence, if $\Pi_0(\overline{L}) + B \geq 1$, G preserves high employment and receives $\Pi_0(\overline{L}) + B$, while M receives his rents E. If the opposite is the case, employment is cut down, G breaks even (i.e. M pays back the loan), and M receives $\Pi_0(\underline{L}) - 1$. Inspection of the joint payoffs shows that there is scope for renegotiation if $\Pi_0(\overline{L}) + E + B < \Pi_0(\underline{L})$. We label this the renegotiation condition R). Assume that R) is satisfied, but G wants to keep excess employment. This decision would lead to a welfare loss. In order to avoid this, M can offer G to pay a transfer at the end of the game in exchange for receiving the control rights. Notice that this contract is enforcable, since profits are verifiable, and the contract entails the transfer of control rights, not the specification of an employment level. Assume for simplicity that M has all bargaining power. Hence, M commits to pay $\Pi_0(\overline{L}) + B$ to G, and cashes in $\Pi_0(\underline{L}) - [\Pi_0(\overline{L}) + B]$ which by definition R) is larger than the rents he would have received without renegotiation.

Performing the same simple operations as in Section 4, one can determine the cut-off levels of disutility beyond which managers shirk (Table 6). Notice that R) cannot hold in cases a) and b) where B is large. Hence, in these cases, excess employment is kept in a regulated firm. In cases c) and d) employment is cut if and only if managerial rents are small, i.e. if R) is satisfied. Otherwise, excess employment is kept. Comparing the respective proportions of restructuring managers leads to our last proposition.

Table 6: Employment size and cut-off disutility levels

Case	Empl.	Cut-off disutility levels
a)	$\overline{L}$	$\Pi_e(\overline{L}) - 1$
b)	$\overline{L}$	$\Pi_e(\overline{L}) - 1$
c),d) *and* R)	$\underline{L}$	$\Pi_e(\overline{L}) - 1 + E - \Pi_0(\underline{L}) + B + \Pi_0(\overline{L})$
otherwise	$\overline{L}$	$\Pi_e(\overline{L}) - 1$

Proposition 6 *In cases a) and b), regulation involves better managerial incentives than privatization. The same is true for cases c) and d) if R) is not satisfied. If R) is satisfied, it depends on the parameters of the model whether or not managerial incentives are stronger in regulation than in privatization.*

Proposition 6 confirms our intuition that regulation may provide stronger incentives than privatization. First, productive managers restructure because they receive the profits of the firm. Second, as the state controls the use of restructuring funds, managers cannot deviate the money to other than

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restructuring purposes. This reduces their payoff associated with shirking, and the relative effect of the positive incentives increases (they only receive their rents instead of a payoff of 1. If M renegotiates, this second effect does not apply and the comparison depends on the parameters of the model

Focusing on those cases in which more managers restructure in regulation than in private ownership and high employment is kept in both ownership forms, it can easily be shown that the budgetary effects of regulation are positive compared to privatization. The main reason is, again, that managers cannot abuse the funds that were injected into the firm. Hence, the maximum the government can lose are the losses due to excess employment $\Pi_0(\overline{L})$ < 1 and regulation dominates privatization. Otherwise, it depends on the interaction of the three effects whether or not the government wishes to fully privatize or to keep the control rights over the firm.

5 Concluding remarks

This paper has shown that the effects of privatization on employment, managerial efficiency and on the budget of a government depend crucially on the profitability of the firm, the quality of managers and the degree to which managers and the government are captured or constrained by the interests of workers. Though it is beyond the scope of the paper to provide an exhaustive empirical analysis of our main results it may be appropriate to give some evidence in order to support two assumptions of our model: the give-away transfer of ownership rights to insiders, and the loss of control over the funds injected into a firm due to any form of privatization.

Insider-privatization: In Russia, voucher privatization has resulted in widespread insider control. The initial hope that outsiders would quickly be able to take-over most firms through emerging financial markets has so far been vain. Insiders stay in control, financial markets remain illiquid (*The Economist*, December 23, 1995) and the Central Bank continues subsidization of unprofitable insider-privatized firms [cf. Boycko, Shleifer and Vishny (1994)]. The second wave of mass privatization has not raised substantial revenues and poor tax collection intensifies pressure on the state's budget. Even in the Czech Republic whose privatization programme was designed with a view to maximize outsider participation, there has been little managerial turnover after privatization which indicates the power of insiders [cf. Mac Millan (1995)].

Loss of control over restructuring funds and refinancing: Privatization in East Germany illustrates the risk of an uncontrolled privatization of unprofitable firms. The Treuhandanstalt injected large funds into its firms. Experience shows that in some cases, investors took the money and ran. While this behaviour caused bad publicity for the Treuhandanstalt [cf. for instance Heimbrecht (1993)], it turns out that the more relevant problem is the lack of commitment of the government not to refinance firms that are in distress. As of today several hundred fomer managers of the Treuhandanstalt are working in the so-called "Bundesanstalt für Vereinigungsbedingte Sonderaufgaben" that monitors privatization contracts. The total net costs of privatization are estimated 300 billion DM, a large part of which were subsidies given to outside investors.

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