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Kira Börner:

## The Political Economy of Privatization

Munich Discussion Paper No. 2004-1

Department of Economics  
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# THE POLITICAL ECONOMY OF PRIVATIZATION: WHY DO GOVERNMENTS WANT REFORMS?

KIRA BÖRNER

ABSTRACT. International organizations promote privatization as precondition for economic development. But is there really too little privatization? This political economy model asks for the incentives of governments to privatize or restructure a state-owned firm. Different government types are compared to identify the political and institutional determinants of privatization. Under privatization, governments commit not to influence the profit-maximizing employment choice by private investors. With respect to the social optimum, both voter-oriented and egoistic governments can have inefficiently high incentives to privatize. When this is the case, outside pressure to privatize is detrimental. An improving institutional environment reduces these inefficiencies.

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## 1. INTRODUCTION

During the last decade, international organizations have promoted privatization as a prerequisite for economic development. The idea is that privatization of the state-owned sector enhances the efficiency and competitiveness of an economy. Empirically, however, the success of privatization programs is mixed. For some countries, such as the Czech Republic or Russia, the first positive assessments have changed. Kenneth Arrow called the Russian privatization “a predictable economic disaster”. This does not only concern transition countries: For the British railroads, recent considerations now include a partial reversal of privatization.

What is the reason for this mixed success of privatization? There seems to be no simple answer.<sup>1</sup> Theoretical and empirical research is increasingly pointing to political economy explanations: Governments may have interests other than enhancing productive efficiency. Influenced by their private incentives and lobbies, they may choose privatization when this is not efficient. Such a privatization can, in turn, strengthen interest groups opposed to further reforms. An example is the privatization to insiders who oppose a reorganization of the firm for fear of losing their jobs (Blanchard and Aghion, 1996). Thus, the success of privatization depends on efficient incentives of the political leadership, supported by a functioning economic environment.

The World Bank (1995) has formulated the political requirements for a successful privatization: desirability for the political leadership, feasibility, the possibility to create support for the policy, and credibility, that is, no easy policy reversal. The political economy literature has so far focused on the feasibility and the credibility of privatization.<sup>2</sup> This paper looks at the *incentives* to privatize. It addresses the first requirement, the desirability of privatization.

In the existing literature, the incentive to privatize is often explained by a switch of government preferences towards efficiency.<sup>3</sup> Such a switch in preferences, for example through outside pressure, is not a satisfying explanation for political decisions. This model compares the privatization incentives for different government types and identifies in this way the determinants

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<sup>1</sup>For an overview of empirical studies see Megginson and Netter (2001) and Sheshinski and Lopez-Calva (2003).

<sup>2</sup>For overviews see Haggard and Webb (1994), Vickers and Yarrow (1994), or Shirley and Walsh (2000).

<sup>3</sup>Shirley and Walsh (2000), p. 44, state “Instead of maximizing its own rents and power, the government places a priority on efficiency. It can be argued that governments that engage in privatization are not the ones that seek only rents and power.”

of the political choice between privatization and restructuring. Governments interested in rents and power can very well have incentives to implement privatization programs.

The paper analyzes the incentives to privatize for different types of government, a voter-oriented government, and an egoistic government, which is interested in revenues. The social planner is used as the benchmark. Governments can privatize or restructure a state-owned firm. Under restructuring, the production process of a firm is reorganized but it remains in state ownership. To describe the trade-off for governments in this decision, the model focusses on the employment choice in the firm, that is, the input side of production.

The contribution of the paper is threefold: First, it looks at the incentives of governments in their decision to privatize. Second, once the incentives are identified, it asks whether or not they are efficient. For reasons depending on their objective functions, all government types have incentives to implement privatization programs. These incentives can be inefficiently high: Governments that are not interested in improving the efficiency of their economies may destroy social value by choosing too much privatization. For the voter-oriented government, privatization is the more effective option to distribute surplus to the voters. The egoistic government may privatize too much as its revenue-orientation lets it undervalue the social costs of privatization. Third, the paper asks how these incentives change with the institutional environment of a country: Better institutions are assumed to improve the prospects of the reorganization of a firm both under privatization and restructuring. With better institutions, the inefficiency of incentives to privatize is reduced. This provides an explanation for the higher number of successful privatization programs in industrialized countries.

The results show that privatization cannot be the panacea for efficiency problems in the state-owned enterprises sector. Privatization does not always promote efficiency. With better institutions, this problem is reduced but does not disappear.

It is not obvious why governments desire privatization: In his puzzle of selective intervention, Williamson (1985) asks why privatization should be socially optimal at all. The government could always imitate a private owner and deviate from this strategy only when this improves welfare. One approach to tackle this puzzle has been to use the concept of incomplete contracts (Laffont and Tirole (1991), Lülkesmann (2002), Schmidt and Schnitzer (1993), Schmidt (1996)).

In these models, incomplete contracts create costs of public ownership as the interests of owner and manager are better aligned in a private firm. Schmidt (1996) shows that the social planner uses privatization as a commitment device to create a harder budget constraint for privatized firms. This disciplines the manager and enhances productive efficiency. Under restructuring, this commitment is not credible: Ex post, the government always has the incentive to implement the socially optimal production level. This leads to weakened managerial incentives.

The way the present paper models the difference between a privatized and a state-owned firm is close to Schmidt's approach. In contrast to Schmidt, the trade-off for governments is created not by public good provision but by the employment choice in the firm: Under privatization, the private investors choose the employment level. The government commits not to influence the employment choice, even if that means higher costs of unemployment. Under restructuring, the government chooses the employment level according to its own objectives. Any deviation from the profit-maximizing employment choice reduces the firm's profits and lowers the incentives of the manager. By looking at employment instead of public good provision, the model comes closer to the situation in transition countries, where privatization concerns firms producing normal goods and where unemployment is an important political issue. Employment is a crucial determinant of privatization strategies. This aspect has so far not been sufficiently analyzed.

When considerations about political power or private benefits are guiding political decisions, government officials trade the expected privatization revenues off against the option to interfere with the production process to their own advantage. Bennedsen (2000) compares the realization of excess labor for a firm where the government controls labor to the case where the private owners control labor and both private owners and a labor union can lobby the government. Excess labor arises when the private owners possess little cash-flow rights. A transfer of control over labor to private owners weakly decreases excess labor. In a setting without lobbying, Boycko, Shleifer and Vishny (1996) argue that a government interested in high employment encounters higher costs when trying to distort the employment level in a privatized firm. As in Shleifer and Vishny (1994), privatization is always efficiency enhancing. While these models do not explicitly consider the decision whether or not to privatize, the results imply that privatization is not

attractive for a self-interested government. The present paper comes to the opposite conclusion: A government interested in high employment can have inefficiently high incentives to privatize.

The feasibility of privatization is one of the questions most extensively treated in the political economy literature on privatization: Given that it has decided to privatize, how can a government secure political support? Biais and Perotti (2002, 1997) argue that right wing governments use mass privatization to increase their chance of re-election. When voters become shareholders, they oppose drastic redistribution measures. Schmidt (2000) shows that mass privatization can be a commitment against policy reversal and thus secures political support for privatization. Bös and Harms (1997) also make a point for mass privatization: Dispersed owners can control a management less effectively. Therefore the government has the incentive to mass privatize whenever the manager has a large political weight.

This literature explains the incentives to use mass privatization instead of other privatization strategies. It assumes a general preference for privatization. In contrast to that, the present paper seeks to explain why governments prefer privatization to other policies such as the restructuring the state-owned sector. It does not address the issue of the best privatization method. However, the choice of the privatization price is integrated in the model: As governments have different incentives to privatize, they may also demand different prices for a firm.

The paper is organized as follows: In section 2, the setup of the model is presented. The next three sections describe the welfare-oriented, the voter-oriented, and the egoistic government and their respective choices among the policies privatization and restructuring. The results of the model are shown in section 6, where the incentives to privatize for the three government types are compared and the impact of improving institutions are discussed. The results of the model are illustrated with some empirical observations and related to the existing empirical studies in section 7. The conclusion summarizes the findings.

## 2. THE MODEL

In the model, there is one state-owned firm. The government can privatize or restructure the firm. The paper compares three types of government: The welfare-oriented government maximizes the social surplus of the economy, the voter-oriented government maximizes its chance

FIGURE 1. Government types and policy options

Government types	Policy Options
I) Welfare Maximizer	1) Privatization
II) Vote Maximizer	2) Reform of state-owned enterprise
III) Private Benefit Maximizer	

of staying in power, and the egoistic government maximizes its own revenue. They all have the options to privatize (P), or restructure (R) the firm. The setup is summarized in figure 1.

Privatization and restructuring are modelled as investments in cost reduction. In both cases, a manager is needed to reorganize the production process. The success probability of the reorganization is stochastic and depends on the manager's effort. In case of privatization, the manager is hired by the private investors. In case of restructuring, the government hires the manager.

The policy option determines the allocation of the right of the employment choice: In case of privatization, the owners of the firm choose their preferred employment level without internalizing the negative effects on unemployment. The government covers the costs of unemployment. It commits not to interfere with the private employment choice. The credibility of this commitment is assumed exogenously. Credibility can be created by the informational structure in the subgame after privatization (Schmidt, 1996). After it has privatized the firm, the government has no information about the cost structure before observing the unemployment level. Still, subsidy schemes can be a way to influence the decisions taken in privatized firms. Usually, these subsidies would be associated with additional costs.<sup>4</sup> The present model does not allow these additional channels of influence. From the point of view of the government, this creates a disadvantage for privatization. This strengthens the result of the paper that the incentives to privatize may be sub-optimally high. In case of restructuring, the government has the right to choose the employment level. Thus, it can internalize the costs of unemployment.

**2.1. General Features.** Independent of the government type, the model has some general features: The firm produces an output with value  $Y(L)$ , with the input factor labor  $L \in [0; 1]$ . The identical citizens in the economy are of total mass 1 and are all potential workers in the firm.

<sup>4</sup>In Schmidt (1996), the government can use subsidies to influence the production level of the firm. Then, it has to give an information rent to the private owner. To reduce the information rent in the good state of the world, the government hardens the budget constraint for the firm if high costs realize.



The profit function of the firm is defined as

$$\pi(L, \gamma_k) = Y(L) - (w + \gamma_k)L \quad (1)$$

$Y(L)$  describes a standard production process with  $Y(L)$  twice continuously differentiable,  $Y_L > 0$ ,  $Y_{LL} < 0$ , defined on  $L \in [0; 1]$ . The input price is the fixed wage  $w$ . The additional costs to the input factor  $\gamma_k$ ,  $k = \{g, b\}$ , are efficiency losses in the production process. They arise because of an inefficient organization of the production process where the maintenance of the machines consumes working time, badly designed logistics, or a suboptimal assignment of workers to their tasks. Depending on whether the economy is in the good ( $k = g$ ) or the bad ( $k = b$ ) state of the world, there are low or high losses in the production process:  $\gamma_g < \gamma_b$ . The state of the world is drawn by nature. The probabilities depend on the effort of the manager in the firm.

When the state of the world with the high costs  $\gamma_b$  realizes, the costs are too high to keep up production and the firm has to be shut down. There is no production and no employment. No additional costs have to be incurred for the process of closing down the firm. To model this explicitly, some kind of fixed costs or a minimum output requirement could be introduced: When the costs are so high that only a very small fraction of people are employed and output is very low, production is not possible and the firm is closed down.

When the low-costs  $\gamma_g$  realize, the reorganization of the firm is successful. The owners of the firm can then decide on the employment level, depending on their objectives.

To implement the reorganization of the firm, the owners hire a manager. Managers compete for jobs in a competitive market. A manager has the reservation utility  $\underline{v}^m = 0$ . It is assumed that the manager is risk-neutral, but credit-constrained, so he cannot own the firm. The manager's utility function is given by

$$v^m = w^m - e + E[u(\pi(L))] \quad (2)$$

where  $u_L > 0$  and  $u_{LL} < 0$ . The manager derives utility from his wage, he bears the effort costs, and he gets some private benefits depending on the profit of the firm. This particular form of the manager's utility could be explicitly modelled in a contract that the owners write with the manager: The manager could get a linear contract that gives him a certain fraction of the firm's profits (in the form of shares or other titles). Another idea widely used in the theory of the firm

is that the manager is interested in consumption on the job or fringe benefits. These increase when the firm is more successful.<sup>5</sup>

It is important that the manager is hired in an incomplete contract setting: The owner of the firm can condition the manager's wage only on the profits of the firm, but not on the realized costs  $\gamma_k$  or on the effort of the manager. Effort is usually assumed to be unobservable in principal-agent settings. In addition, the efficiency costs of production  $\gamma_k$  have to be non-verifiable to a court. This means that there is an informational asymmetry: Only the owner and the manager of the firm observe the level of costs  $\gamma_k$ .<sup>6</sup>

These assumptions about the manager's utility function and the non-verifiability of production costs are essential in order to create a trade-off for the social planner between privatization and restructuring: The government is deprived of the option to offer the manager the optimal contract conditioning directly on the production costs  $\gamma_k$ . This potentially creates a disadvantage for restructuring: As the manager is profit-orientated, he shares the objective of profit maximization with private owners of the firm. When the government, following other objectives, distorts the employment level, the manager expects to receive less private benefits. As the government cannot credibly commit not to distort the employment level ex post, it cannot induce the manager to the same high effort as under privatization.

The manager invests  $e$  before the state of the world is drawn by nature. The effort of the manager influences the costs of production by changing the probability distribution over the good and the bad state of the world: At the end of period one, nature draws the good state of the world  $\gamma_g$  with probability  $p(e)$ , and the bad state of the world  $\gamma_b$  with  $1 - p(e)$  with  $p(e)$  twice continuously differentiable,  $p_e(e) > 0$  and  $p_{ee}(e) < 0$ . The scope for improvement of the production process can, in a broad sense, be thought to be determined by the economic

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<sup>5</sup>In assuming this kind of utility function, the model precludes the optimal contract between the owner and the firm and the manager. The aim of the paper is to compare private with state ownership. The contractual form that owners and manager can choose is the same for both cases. As the same distortion is committed twice, it does not matter for the comparison. For a similar utility function of the manager see Schmidt (1996).

<sup>6</sup>In a strict sense, the term incomplete contracts describes a world where certain events cannot be included in a contract because the agents are unable to foresee or anticipate them when writing the contract. The setup here is not incomplete in this sense: It is possible to anticipate that the production costs will be either high or low. However, it is still not possible to condition a contract on them as the production costs cannot be verified to a court. Even if the costs were included in the draft of the contract, a deviation could thus not be enforced.

environment, the possibility to monitor workers, or a functioning infrastructure. With better economic institutions, the effort of the manager may have more impact.

When the low costs state realizes, the owners of the firm choose the employment level according to their objectives. Whenever the employment choice leads to less than full employment  $L < 1$ , the production process creates not only profits but also social costs of  $\underline{w}(1 - L)$ , the unemployment benefits that have to be paid out to the citizens.<sup>7</sup> The expected wage for a citizen in the economy is given by  $Lw + (1 - L)\underline{w}$ . All types of government have to cover the unemployment costs, even if they are not interested in the well-being of their population.

The redistribution process is not without frictions. As is commonly assumed in the literature, the government has a “leaky bucket”: Of every unit of money that passes through the government’s hands before reaching the citizens, a fraction  $\lambda$ ,  $\lambda \in [0; 1]$ , is lost (e.g. due to administrative transaction costs or the costs of maintaining a bureaucracy). The revenue needed to cover the unemployment costs thus amounts to  $(1 + \lambda)\underline{w}(1 - L)$ . The assumption has the purpose to distinguish the social planner from the other government types. Only for the social planner, the questions of who appropriates revenues and how a surplus is redistributed does not play a role. Note that also the social planner is constrained to cover the unemployment costs.

As this model focusses on the employment choice as the motive for privatization, the incentive to privatize in order to create revenue to finance other policy projects is not considered. All governments are endowed with the same initial funds  $E$ , where  $E > 0$  is high enough to cover all possible realizations of unemployment costs. Thus, any incentives for the government that could stem from a tight budget constraint are excluded from the model.<sup>8</sup>

**2.2. Privatization.** Some features of the privatization subgame are independent of the governments’ objective function and are equal for all government types. If the government chooses to privatize in the beginning of period 1, it makes a take-it or leave-it offer to the citizens. The citizens then become investors. By assumption, the investors face no credit constraint, so the

<sup>7</sup>Other costs of unemployment, such as reintegration costs or disutilities of the unemployed are not considered.

<sup>8</sup>The need to create revenue is certainly a very important incentive to privatize for governments of all types. A thorough analysis of this question would, however, need a different theoretical framework: The trade-off between realizing a gain from privatization once and receiving lower revenue for a longer period of time from a state-owned firm is best captured in a dynamic or at least, multi-period model. Furthermore, taxes and the possibility of government debt would have to be included in the model.

privatization price can be expressed in expected terms.<sup>9</sup> The price for the firm,  $aX$ , is a fraction  $a \in [0; 1]$  of the expected present value of the firm's profits, denoted by  $X = p(e)\pi(L_P) - w_P^m$ , so no further discounting is needed. In the privatization price, the manager's wage is included. This means that the investors always buy the firm when the government decides to privatize. Furthermore, it is always optimal for the investors to hire a manager and offer him the wage  $w_P^m$ . They will, in expectation, always make positive profits.

The government chooses  $a$  according to its objective function. With  $a = 1$ , the government auctions off the firm and appropriates the expected profits. If the government chooses  $a = 0$ , it gives away the firm for free. This is comparable to voucher privatization, which has been applied, for example, in the Czech Republic or Russia. The vouchers serve as a currency to buy shares and are distributed to the population for free. For all intermediate cases  $0 < a < 1$ , the government uses underpricing, leaving some of the firm's surplus to the investors. The choice of the privatization price thus captures a basic difference of privatization strategies. On the other hand, the model does not allow to define the number of buyers (the firm is sold to all citizens).

In the privatization subgame, the risk-neutral private investors hire a manager and offer him a wage. The wage cannot condition directly on the costs of production but only on the firm's profits. The manager decides on his effort level anticipating the employment choice and the firm's profits for the two possible states of the world in period 2. In his effort choice, the manager maximizes  $v^m = w^m - e + p(e)\pi(L_P)$ . The manager's optimal effort choice is given by

$$\frac{\partial p(e)}{\partial e} = \frac{1}{u(\pi(L_P))} \quad (3)$$

With monotonicity and concavity of  $p(e)$  and  $u(\pi)$ , this uniquely defines the success probability of the reorganization of the firm after privatization  $Prob(\gamma_g) = p_P$ . The owners of the firm anticipate this effort choice and offer the manager the fixed wage  $w_P^m = e_P - p_P u(\pi(L_P))$ , holding his utility down to his reservation utility. As the manager derives some private benefits from the firm's profits, the owners do not have to compensate his full effort costs.

When the reform has been a success, the investors choose the employment level  $L$  in order to maximize the firm's profits:  $L_P = \operatorname{argmax}[\pi(L, \gamma_g)] = \operatorname{argmax}[Y(L) - (w + \gamma_g)L]$ . The

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<sup>9</sup>If the investors were credit constrained, the government could not charge a positive price for the firm as the investors would not be able to pay in the bad state of the world.

employment level under privatization  $L_P$  is given implicitly by

$$\frac{\partial Y(L)}{\partial L} = w + \gamma_g \quad (4)$$

The investors choose the profit maximizing employment without taking into account the externality of higher unemployment costs. The government has to bear these costs without having any possibility to interfere in the production process.

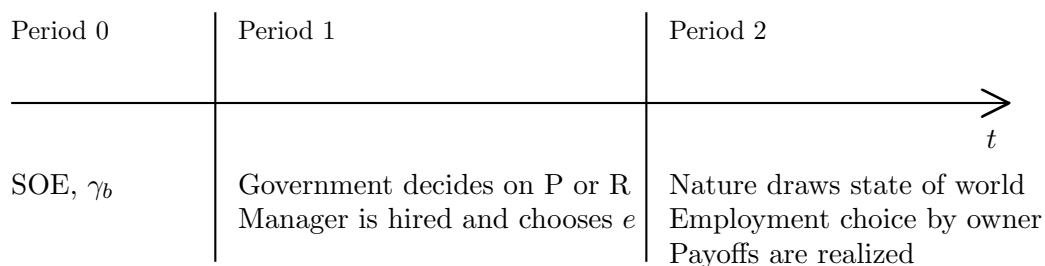
**2.3. Restructuring.** When the government decides to restructure, it remains the owner of the firm and chooses the employment level. This choice depends its objectives. The restructuring subgame is discussed separately for the three government types in the following sections.

**2.4. Time Structure.** In *period 0*, the firm is state-owned. The production process has not been reorganized and the efficiency costs of production are high. That means that the firm has to be shut down for sure if no reform is undertaken. Thus, all types of government have the incentive to undertake one of the two reforms, privatization or restructuring.<sup>10</sup>

In the beginning of *period 1*, the government restructures or privatizes the firm. Then, the respective owner of the firm hires a manager. The manager reorganizes the production process by investing  $e$  in period 1, *before* the state of the world realizes. The success probability of reform is given by  $p(e)$ . With probability  $1 - p(e)$ , the reform fails and the firm is shut down.

In the beginning of *period 2*, nature draws the state of the world  $\gamma_k$  with the probabilities defined by the manager's investment. If the reform has been successful, the owner of the firm decides on the input labor  $L$ . At the end of period 2, the output is produced and the payoffs are realized. The time structure of the model is summarized in figure 2.

FIGURE 2. Time structure



<sup>10</sup>Under which circumstances reforms are undertaken at all is a further interesting question. As the focus on the paper lies on the decision to privatize, this option is not modelled here.

**2.5. Technical Assumptions.** This section describes the technical assumptions needed to ensure internal solutions and to make the model mathematically smooth.

**Assumption 1.**  $\lim_{L \rightarrow 0} Y_L = \infty$  and  $\lim_{L \rightarrow 1} Y_L = 0$

**Assumption 2.**  $\lim_{e \rightarrow 0} p_e = \infty$  and  $\lim_{e \rightarrow \infty} p_e = 0$

**Assumption 3.**  $\gamma_g > \lambda w$ ,  $w > (1 + \lambda)\underline{w}$

**Assumption 4.**  $Y(1) \geq w + \gamma_g$

**Assumption 5.** *A higher employment level also leads to a higher expected employment level: For  $\hat{L} > L$ ,  $p_{\hat{L}} \hat{L} > p_L L$ .*

Assumptions 1 and 2 are Inada-type conditions that ensure internal solutions for the effort choice of the manager and, together with assumption 3, for the employment choices of all government types. Assumption 4 ensures that profits in the low cost state are positive for all possible employment levels. No firm is kept in operation with a successful reform but still negative profits. Assumption 5 concerns the relation between employment levels and the success probabilities of reform. It is needed in order to capture the positive aspects of a higher employment level in the state-owned enterprise also in expected terms. It is important for all cases where  $L > L_P$ : Then, a higher employment level means lower profits of the firm. This leads to a lower effort of the manager and thus decreasing probabilities for the low-costs state of the world.

### 3. THE WELFARE-ORIENTED GOVERNMENT

The case of the social planner is used as the benchmark to evaluate the decisions of the other two government types. The welfare-oriented government chooses the policy that maximizes social welfare. Given the policy alternative, it undertakes all measures to maximize welfare. The model is solved by backward induction. It is first described how the government acts to maximize its objective function given privatization or restructuring. These two maximal values of the objective function are then compared to derive the conditions for the decision to privatize or restructure. The same approach is later used for the other government types.

Social welfare is defined as the sum of all benefits and costs in the economy, except for the utility of the manager. The manager is deliberately left out of the welfare analysis: First, the social planner would be the only type of government to consider the manager's utility. This means that all comparisons with other government types would depend on the assumptions on the manager's utility function. Second, realistically, the policy choice between privatization and restructuring should not depend on the utility of a single manager. Thus, it would be necessary to calibrate the manager's utility function so that it does not outweigh all other effects. The easiest way to solve that problem is to exclude the manager from the welfare analysis.<sup>11</sup>

**3.1. Privatization.** If the social planner privatizes the firm, the investors hire a manager and decide on employment as described in section 2.2. Under privatization, welfare is given by

$$W_P = p_P \pi(L_P) + p_P w L_P - \lambda \underline{w} (1 - p_P L_P) + E \quad (5)$$

Note that the privatization price  $aX$  is not relevant for the social planner: Who appropriates the profits of the firm has no consequences for welfare. However, the inefficiencies in redistribution are important. Therefore, the government will not redistribute any revenues above the minimal amount needed to pay the unemployment benefits. The model assumes domestic privatization. If the firm were to be sold to foreign investors, the social planner would set the maximal privatization price  $a = 1$ .

**3.2. Restructuring.** If the welfare-oriented government decides to restructure the firm, it hires a manager. At the beginning of period 2, the government observes the state of the world  $\gamma_k$ . When the reorganization of the firm has been successful (the low cost state of the world  $\gamma_g$  has realized), the social planner chooses the employment level in order to maximize its objective function  $W(L)$ :  $L_R = \operatorname{argmax}[W(L, \gamma_g)] = \operatorname{argmax}[Y(L) - \gamma_g L - \lambda \underline{w} (1 - L)]$ . The employment level under restructuring  $L_R$  is then given implicitly by

$$\frac{\partial Y(L)}{\partial L} = \gamma - \lambda \underline{w} \quad (6)$$

Note that with  $Y(L)$  concave,  $L_R > L_P$ . When the government owns the firm, it can internalize the unemployment costs. As being employed gives a higher utility to a citizen, the government

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<sup>11</sup>Even for transition countries, where privatization programs concern many firms at once, the number of managers always is small compared to the number of people employed in these firms.

wants to employ more people than the private owner. On the other hand, the revenues from the profits of the firm are then lower as  $L_R$  is higher than the profit-maximizing employment level.

In period 1, the government hires a manager who invests in reorganizing the production process. The manager maximizes  $v^m = w^m - e + p(e)\pi(L_R)$ . His optimal effort is uniquely defined by

$$\frac{\partial p(e)}{\partial e} = \frac{1}{u(\pi(L_R))} \quad (7)$$

This also uniquely defines the success probability of the reorganization after restructuring  $Prob(\gamma_g) = p_R$ . The fixed wage offered by the government then is  $w_R^m = e_R - p_R u(\pi(L_R))$ .

**Lemma 1.** *The effort the manager exerts and the probability for the low-cost state of the world  $\gamma_g$  is higher under privatization than under restructuring:  $e_P > e_R$  and  $p_P > p_R$ .*

*Proof.* Employment under restructuring  $L_R$  is higher than the profit-maximizing employment level  $L_P$ . Therefore, the profits of the firm are lower under restructuring.  $u(\pi)$  is increasing in  $\pi$ , and  $p(e)$  is strictly concave in  $e$ . Thus, the first order condition for the manager's effort choice is fulfilled by a larger  $e$  in the case of privatization.  $p_P > p_R$  follows from  $p_e(e) > 0$ .  $\square$

In the restructuring subgame, it is of particular importance that the wage cannot condition directly on the costs of production but only on the firm's profits. The government distorts the profits because it chooses a higher employment level than under privatization. The manager, who derives private benefits from the profits, decides on his effort level anticipating this profit distortion. This leads to the "ratchet effect": The government reduces the reward for the investment of the manager in the good state of the world. In the bad state of the world, the firm is closed down. Thus, there is a hard budget constraint of the firm. Note that the government cannot credibly commit to a higher profit level. Ex post, after the effort choice of the manager, it always has the incentive to choose the higher socially optimal employment. The manager anticipates this and invests accordingly less effort.<sup>12</sup> Welfare in the case of restructuring then is

$$W_R = p_R \pi(L_R) + p_R w L_R - \lambda w (1 - p_R L_R) + E \quad (8)$$

<sup>12</sup>Renegotiations for higher effort in exchange for lower employment would not qualitatively change the results. See Schmidt (1996, p.12). Renegotiations are not considered in this model as the focus lies on the comparison of different government types.



**3.3. Policy choice of the welfare-oriented government.** By comparing the welfare levels for the two policy options, it is now possible to determine when privatization is socially optimal.

**Proposition 1.** *The welfare-oriented government privatizes if and only if  $W_P > W_R$ . This is the case when*

$$p_P\pi(L_P) - p_R\pi(L_R) > (w + \lambda w)(p_R L_R - p_P L_P) \quad (9)$$

*Proof.* Condition 9 is derived from 5 and 8. After fixing the parameter values, the curvature of the probability function  $p_{ee}(e)$  can be adjusted for results in either way. If the social planner privatizes,  $p_{ee}(e)$  should not be too small (the curvature of  $p(e)$  should not be too strong).  $\square$

Condition 9 shows the trade-off for the social planner: On the one hand, privatization enhances productive efficiency. The profit of the firm is higher as the owners choose the profit-maximizing employment level. In addition, this leads to a higher effort of the manager and a higher success probability of reform. This further increases the difference of expected profits between privatization and restructuring.

On the other hand, restructuring allows for the choice of the socially optimal employment level. The right hand side of condition 9 shows the gains from restructuring: A higher expected employment level means that more citizens receive the wage  $w$ . In addition, lower unemployment also saves on the redistribution losses  $\lambda w$ . Proposition 1 is now used as the benchmark to evaluate the policy choices of the voter-oriented and the egoistic governments.

#### 4. THE VOTER-ORIENTED GOVERNMENT

The voter-oriented government maximizes its chance of reelection. Ex ante, all voters are identical. They vote for the candidate who offers them the largest expected surplus. There are no veto players or special interest groups. The electoral competition is not modelled explicitly. Elections are assumed to happen just before period 0. They are won on the basis of the expected payoffs for the voters in the next period. The incumbent and the challenger fully commit to their promised policies. By assumption, the challenger in the elections promises the voters the political program that gives them the highest expected income. The incumbent government

thus has the incentive to maximize the surplus it can distribute to the voters. Otherwise, the challenger has the opportunity to promise a higher surplus and win the elections.<sup>13</sup>

**4.1. Privatization.** If the voter-oriented government privatizes the firm, the investors decide on employment as described in section 2.2. The government's objectives are then given by

$$V_P = p_P \pi_P(L_P) - aX + p_P w L_P + \frac{1}{1+\lambda} [E + aX] \quad (10)$$

The last term describes the redistribution of government revenue: The government gives its endowment and its privatization revenue to the voters to maximize their payoff. The unemployment benefits are included in that amount. The redistribution leaves the fraction  $\frac{1}{1+\lambda}$  to the voters, the rest is lost. The government chooses the privatization prize  $aX$  to maximize  $V_P$ .

**Lemma 2.** *The voter-oriented government uses underpricing. It chooses the lowest possible privatization price  $a = 0$ .*

*Proof.* After simplification,  $a$  enters  $V_P$  with  $-\frac{\lambda}{(1+\lambda)}aX$ . That is, any reduction of  $a$  increases  $V_P$ . Thus,  $a$  is chosen as low as possible.  $\square$

Any redistribution of government revenue entails the loss of a fraction  $\lambda$  of the amount that reaches the citizens. These efficiency losses give the government the incentive to use underpricing to increase the revenue of its voters. The government's payoff from privatization thus is

$$V_P = p_P \pi(L_P) + p_P w L_P + \frac{1}{1+\lambda} E \quad (11)$$

**4.2. Restructuring.** The objective of the government is to maximize the voters' expected surplus. Voters receive the expected wage. In addition, the government distributes its endowment and all profits from the firm to the voters. Unemployment payments are included in this sum. The redistribution process creates costs of  $\lambda$  times the net revenue of the voters.

$$V_R = p(e)wL + \frac{1}{(1+\lambda)} [E + p(e)\pi(L)] \quad (12)$$

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<sup>13</sup>There are many ways to model electoral competition. The assumption of pre-election politics totally excludes the possibility that some groups of voters may not vote for the government because they suffer from a policy ex post. The inclusion of veto players would imply changed incentives both for restructuring and privatization. For example, if voters were to vote by retrospection, the unemployed would probably be against privatization. On the other hand, workers might support privatizing governments when they become shareholders. This simpler model thus does not predetermine the solutions. Biais and Perotti (2002) and Schmidt (2000) use such more complicated setups.

When restructuring is successful, the voter-oriented government chooses employment in order to maximize its objective function  $V_R$ :  $L_V = \operatorname{argmax}[V_R(L, \gamma_g)] = \operatorname{argmax}[wL + \frac{1}{(1+\lambda)}\pi(L)]$ .

The employment level under restructuring  $L_V$  is then given implicitly by

$$\frac{\partial Y(L)}{\partial L} = \gamma_g - \lambda w \quad (13)$$

Note that with  $Y(L)$  concave and  $w > \underline{w}$ , also  $\frac{\partial Y(L)}{\partial L}|_{L_V} < \frac{\partial Y(L)}{\partial L}|_{L_R}$  and therefore  $L_V > L_R$ . The employment level chosen by the voter-oriented government is higher than the socially optimal employment level. The reason is that the voter-oriented government uses employment as a way to distribute revenue to the voters. The wage is welfare-neutral. As it is paid out directly by the firm, there are no redistribution losses. The voter-oriented government overvalues the positive aspect of wage payments: The redistribution of profits of the firm entails losses of  $\lambda$ . The wages as part of the production costs are thus discounted by  $\lambda$ . On the other hand, for the utility of the citizens from the expected wage, the full wage payment is taken into account.

In period 1, the government hires a manager who invests in reorganizing the production process. The manager's utility function and his wage are similar to the ones discussed above. The manager's optimal effort choice is uniquely defined by

$$\frac{\partial p(e)}{\partial e} = \frac{1}{u(\pi(L_V))} \quad (14)$$

This also uniquely defines the success probability of a reorganization after restructuring for the voter-oriented government  $\operatorname{Prob}(\gamma_g) = p_V$ .

**Lemma 3.** *The effort the manager exerts and the probability for the low-cost state of the world  $\gamma_g$  is lower when he is employed by the voter-oriented government than when he is employed by the social planner:  $e_P > e_R > e_V$  and  $p_P > p_R > p_V$ .*

*Proof.* The voter-oriented government chooses an employment level that is higher than the socially optimal employment level under restructuring,  $L_V > L_R$ . Therefore, the voter-oriented government receives even less profits of the firm,  $\pi(L_V) < \pi(L_R)$ . As this also leads to  $u(\pi(L_V)) < u(\pi(L_R))$ , the first order condition for the manager's effort choice is fulfilled by a smaller  $e$  in the case of voter-oriented restructuring. As  $p(e)$  is increasing in  $e$ , a lower effort unambiguously leads to a lower probability of the low-cost state of the world.  $\square$

Given the employment choice, the payoff for the voter-oriented government is

$$V_R = p_V w L_V + \frac{1}{1+\lambda} [E + p_V \pi_V(L_V)] \quad (15)$$

**4.3. Policy choice of the voter-oriented government.** It is now possible to determine the condition for the policy choice of the voter-oriented government

**Proposition 2.** *The voter-oriented government privatizes if and only if  $V_P > V_R$ . This is the case when*

$$p_P \pi(L_P) - \frac{1}{1+\lambda} p_V \pi(L_V) > w(p_V L_V - p_P L_P) \quad (16)$$

*Proof.* Condition 16 is derived directly from equations 11 and 15. □

Also for the voter-oriented government, privatization is attractive because it leads to higher profits. Because of the higher employment level, profits under restructuring are here even lower. As the government has the incentive to distribute the firm's profits to the voters, it has to incur the redistribution losses. Therefore, the expected profit from restructuring  $p_V \pi(L_V)$  is further reduced by  $\frac{1}{1+\lambda}$ . Privatization together with underpricing gives the firm's profits directly to the citizens and saves on these additional costs.

The difference to the social planner is that the voter-oriented government has the incentive to maximize the payoff of the voters in the short term, in spite of the redistribution losses that have to be incurred. Although legislative periods are not explicitly modelled, implicitly the government only cares about the coming elections. It has no incentive to engage in long-term considerations or to keep revenue for later investments. The challenger would immediately use this for his own advantage, distribute all available revenue to the voters and win the elections.

Both the voter-oriented government and the social planner see the advantage of restructuring in the higher employment level. The reasons are, however, different: Whereas the social planner internalizes the unemployment costs, the voter-oriented government is interested in increasing expected wage payments. Thus, for the voter-oriented government, the attractiveness of restructuring is weighed with the wage  $w$  (see right hand side of condition 16).

## 5. THE EGOISTIC GOVERNMENT

The egoistic government maximizes its own expected revenues. They comprise the privatization price or the profits of the firm after restructuring. In contrast to the voter-oriented government, it is not interested in distributing these gains to the citizens. Whether the money goes into the private pockets of politicians or is kept for other political projects is not modelled. The egoistic government pays the unemployment costs even if it does not care about its citizens. This is plausible as all political leaders have to ensure some minimum living conditions for their citizens to secure their political power and reduce the incentives for a revolution.

**5.1. Privatization.** If the government privatizes the firm, the investors decide on employment as described in section 2.2. The government receives the privatization proceeds  $aX$  and has to come up for the unemployment costs. The objectives of the egoistic government are given by

$$U_P = aX - (1 + \lambda)\underline{w}(1 - p_P L_P) + E \quad (17)$$

The egoistic government chooses the privatization prize  $aX$  to maximize  $U_P$ .

**Lemma 4.** *The egoistic government chooses the highest possible privatization price  $a = 1$ .*

*Proof.*  $a$  enters  $U_P$  positively. To maximize  $U_P$ ,  $a$  is chosen as large as possible. □

The government's revenue stems from privatization. It is not interested in the utility of the citizens. Therefore, it demands the full expected profits of the firm as privatization price. Using this result, the government payoff from privatization is

$$U_P = p_P \pi(L_P) - (1 + \lambda)\underline{w}(1 - p_P L_P) + E \quad (18)$$

**5.2. Restructuring.** The objective of the government is to create as much expected revenue as possible. However, it also has to cover the unemployment costs:

$$U_R = p(e)\pi(L) - (1 + \lambda)\underline{w}(1 - p(e)L) + E \quad (19)$$

When, after restructuring, the reform is successful, the voter-oriented government chooses the employment level in period 2 in order to maximize its objective function  $U_R$ :  $L_U =$

$\text{argmax}[U_R(L, \gamma_g)] = \text{argmax}[p(e)\pi(L) - (1 + \lambda)\underline{w}(1 - p(e)L) + E]$ . The employment level under restructuring  $L_U$  is then given implicitly by

$$\frac{\partial Y(L)}{\partial L} = w + \gamma_g - (1 + \lambda)\underline{w} \quad (20)$$

As  $\frac{\partial Y(L)}{\partial L}|_{L_U} > \frac{\partial Y(L)}{\partial L}|_{L_R}$ ,  $L_U < L_R$ . Furthermore,  $\frac{\partial Y(L)}{\partial L}|_{L_U} < \frac{\partial Y(L)}{\partial L}|_{L_P}$  and  $L_U > L_P$ . The egoistic government chooses a lower employment level than the social planner. As it does not care about the well-being of the voters, it counts the total unemployment payments as costs. The social planner only considers the efficiency losses of redistribution. In contrast to the private investors, the egoistic government internalizes the consequences of unemployment. Therefore, it chooses an employment level larger than  $L_P$ , even though it is profit-oriented.

In period 1, the government hires a manager. His optimal effort choice is uniquely given by

$$\frac{\partial p(e)}{\partial e} = \frac{1}{u(\pi(L_U))} \quad (21)$$

This also uniquely defines the success probability of the reform  $\text{Prob}(\gamma_g) = p_U$ .

**Lemma 5.** *The effort the manager exerts and the probability for the low-cost state of the world  $\gamma_g$  is higher when he is employed by the egoistic government than when he is employed by the social planner, but still lower than in the case of privatization:  $e_P > e_U > e_R$  and  $p_P > p_U > p_R$ .*

*Proof.* The lower employment level  $L_U < L_R$  chosen by the egoistic government leads to higher profits of the firm than for the social planner,  $\pi(L_U) > \pi(L_R)$ . This means higher private benefits for the manager,  $u(\pi(L_U)) > u(\pi(L_R))$ . Therefore, the first order condition for the manager's effort choice is fulfilled by a larger  $e$ . As  $p(e)$  is increasing in  $e$ , this unambiguously leads to a higher probability of the low-cost state of the world.  $\square$

The payoff from restructuring for the egoistic government is

$$U_R = p_U\pi(L_U) - (1 + \lambda)\underline{w}(1 - p_UL_U) + E \quad (22)$$

**5.3. Policy choice of the egoistic government.** It is now possible to determine the conditions for the policy choice of the egoistic government

**Proposition 3.** *The egoistic government privatizes if and only if  $U_P > U_R$ . This is the case when*

$$p_P\pi(L_P) - p_U\pi(L_U) > (1 + \lambda)\underline{w}(p_UL_U - p_PL_P) \quad (23)$$

*Proof.* Condition 23 is derived directly from equations 18 and 22.  $\square$

Privatization again leads to higher profits. The egoistic government trades that off against the possibility to choose the employment level under restructuring where it can internalize the unemployment costs. This, however, means lower profits and a lower effort of the manager. This further reduces expected profits from restructuring. The difference to the social planner is that the egoistic government considers the full costs of unemployment instead of the efficiency losses of redistribution when choosing its preferred employment level under restructuring.

## 6. INCENTIVES FOR PRIVATIZATION AND RESTRUCTURING

Do governments have efficient incentives to privatize? This question is answered by comparing the incentives to privatize of the different governments to those of the social planner. Each government faces the basic trade-off of increasing the productivity of the economy by privatization and its other objectives, such as pleasing voters or creating private revenue.

### 6.1. Incentives of the Voter-oriented Government.

**Proposition 4.** *The voter-oriented government has inefficiently high incentives to privatize when the employment effect is relatively weak. This is the case if and only if  $V_P - V_R > W_P - W_R$ , that is*

$$p_R\pi(L_R) - \frac{1}{1 + \lambda}p_V\pi(L_V) + \lambda\underline{w}(p_RL_R - p_PL_P) > w(p_VL_V - p_RL_R)$$

*Proof.* Condition 4 is directly derived from equations 5, 8, 11, and 15.  $\square$

The incentives of the voter-oriented government are shaped by three effects: The profit effect, the redistribution effect, and the employment effect. First, the profit effect distorts its incentives towards too much privatization. By choosing the higher employment level  $L_V$ , the voter-oriented government decreases the expected profits of the firm under restructuring. In addition, to maximize its chance of re-election, it has the incentive to distribute all available

surplus to the voters. This redistribution entails efficiency losses. These costs render the option of restructuring, where the government receives the firm's profits, less attractive. Privatization saves on these redistribution losses. The government chooses privatization as the cheaper way of increasing the expected payoff of the voters.<sup>14</sup>

Second, the voter-oriented government does not consider an advantage of restructuring, namely that higher employment reduces the efficiency losses from unemployment payments. This is the redistribution effect. It is intuitive as the voter-oriented government distributes all its revenues and its initial endowment; unemployment payments are just a part of it. If there is less unemployment, the government is just left with more of the firm's profits that it gives to the voters. The neglect of this advantage of restructuring makes privatization relatively more attractive for the voter-oriented government. Incentives to privatize are distorted upwards.

The third effect, the employment effect, works in the other direction. The voter-oriented government chooses a higher than socially optimal employment level. The reason is that this increases the expected wage of the voters. Employment is chosen as a means of redistribution. Thus, for the voter-oriented government, the right to choose the employment level constitutes an advantage of restructuring and makes privatization relatively less attractive.

Depending on which effect is strongest, incentives to privatize can be either too low or too high. This depends on the exact shape of the production function and the probability function.

To better understand the intuition for this result, consider the case where the government is not able to choose the employment level according to its objectives. Assume that it has to take the socially optimal employment level  $L_R$  as given. Employment levels, profits, manager effort and the probabilities for the states of the world remain unchanged. A rationale for this could be that not the politicians themselves decide about the labor used in the firm but that they delegate the decision to the bureaucracy. The bureaucrats might have interests other than the short-term objectives of the politicians. One of them might be to act in the social interest. Then, inefficiently high incentives to privatize can stem only from the different objective functions.

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<sup>14</sup>It is not crucial for this result that privatization does not entail efficiency losses at all. The only requirement is that the losses be smaller than  $\lambda$ .



**Corollary 1.** *When the voter-oriented government takes the socially optimal employment level  $L_R$  as given, it has inefficiently high incentives to privatize.*

*Proof.* The voter-oriented government has inefficiently high incentives to privatize if and only if  $\frac{\lambda}{1+\lambda}p_R\pi(L_R) + \lambda\underline{w}(p_R L_R - p_P L_P) > 0$ . As expected profits are positive and expected employment is higher under restructuring due to assumption 5, this condition is always fulfilled.  $\square$

When it cannot influence the employment level, the voter-oriented government always has inefficiently high incentives to privatize. The employment effect that constitutes the advantage of restructuring has disappeared. The profit effect is reduced: As expected profits are the same for all governments, only the losses from redistribution increase the attractiveness of privatization. The second effect, the neglect of savings on the efficiency losses of unemployment payments, remains unchanged. Only the employment effect distorts the incentives of the voter-oriented government towards too little privatization. Whenever the employment effect is not very strong, the voter-oriented government thus has inefficiently high incentives to privatize, even if it then foregoes the right to choose employment.

This result captures the short-sightedness of democratic governments: In order to increase the income of the voters in the short term, the government chooses to privatize even in cases where it would have been optimal to restructure. The voter-oriented government is unable to take into account that restructuring may have better long-term effects. This failure of governments to first restructure a firm and then sell it as a “cash cow”, creating a larger revenue, can often be observed. This mechanism can only be overcome by a strong employment effect.

## 6.2. Incentives of the Egoistic Government.

**Proposition 5.** *The egoistic government has inefficiently high incentives to privatize when the profit effect is relatively weak. This is the case if and only if  $U_P - U_R > W_P - W_R$ , that is*

$$w(p_R L_R - p_P L_P) - \underline{w}(p_U L_U - p_P L_P) + \lambda\underline{w}(p_R L_R - p_U L_U) > p_U \pi(L_U) - p_R \pi(L_R) \quad (24)$$

*Proof.* Condition 5 is directly derived from equations 5, 8, 18 and 22.  $\square$

Also for the egoistic government, three effects shape the incentives to privatize: The labor cost effect, the unemployment effect, and the profit effect. First, the labor cost effect,  $w(p_R L_R -$

$p_P L_P) - \underline{w}(p_U L_U - p_P L_P)$ , always distorts the incentives of the egoistic government towards too much privatization. The intuition is the following: The egoistic government sees wages only as a part of the production costs of the firm. In contrast to the social planner, it does not consider the positive effect of wages.  $w(p_R L_R - p_P L_P)$  describes this undervaluation of wages and employment by the egoistic government. The egoistic government does, however, internalize the unemployment payments. This makes restructuring more attractive. In total, as  $w > \underline{w}$ , this positive aspect of restructuring cannot compensate for the losses of higher wage payments.

Second, the unemployment effect makes restructuring for the egoistic government relatively less attractive: Like the social planner, it considers the efficiency losses from unemployment payments. The disadvantage of restructuring stems from the employment choice: By choosing the lower expected employment level  $p_U L_U$ , the egoistic government reduces the savings of redistribution losses that could be realized by restructuring.

Third, via the profit effect, restructuring has a positive aspect for the egoistic government: By choosing a lower employment level than the social planner the egoistic government increases the revenues from the firm with respect to the profit  $\pi(L_R)$  for the social planner. The possibility to choose the employment level constitutes the incentive to restructure.

For the egoistic government, privatization is attractive as it saves on the labor costs, even net of additional unemployment costs. Furthermore, the additional redistribution losses from unemployment are not as high as for the social planner. On the other hand, restructuring is attractive because it allows to adjust the employment choice to realize higher profits and at the same time internalize the costs of unemployment.

Also here, it helps to consider the case where the government cannot choose the employment level according to its objectives but takes the socially optimal employment level  $L_R$  as given.

**Corollary 2.** *When the egoistic government takes the socially optimal employment level  $L_R$  as given, it has inefficiently high incentives to privatize.*

*Proof.* The egoistic government has inefficiently high incentives to privatize if and only if  $w(p_R L_R - p_P L_P) - \underline{w}(p_R L_R - p_P L_P) > 0$ . As  $w > \underline{w}$  by assumption, the result follows directly.  $\square$

When it cannot influence the employment level, the egoistic government always has inefficiently high incentives to privatize. As it does not redistribute any profits of the firm, the egoistic government is in this respect not different from the social planner. The profit effect does not play a role. For the egoistic government, wages only count as costs. This labor cost effect makes privatization attractive. For the egoistic government, only the profit effect can distort the incentives towards too little privatization. That means that whenever the profit effect is not very strong, this government type has inefficiently high incentives to privatize. Without a free employment choice, incentives to privatize are always too high.

The main result of the model can be summarized as follows: In particular governments that have other objectives than improving productive efficiency have incentives to choose privatization. Moreover, these incentives can be inefficiently high. Privatization programs are selected in cases where a restructuring of the state-owned firm would have been the better option. This seems surprising as the existing literature so far shows that non-benevolent governments do not have incentives to implement privatization programs. At a closer look, however, it becomes clear that there are additional effects which have so far been neglected in the literature.

What determines these results? In the present model, the political leadership can take several actions to reach its objectives: In case of privatization, it can choose the privatization price. In case of restructuring, it can choose the employment level according to its objectives, only constrained by the unemployment payments. Furthermore, the government always has the possibility to redistribute revenue to its citizens.

A consideration of these additional channels of political action is important. Their neglect leads to the result that governments with objectives other than productive efficiency would have no incentives to privatize at all. This is implied by Boycko, Shleifer and Vishny (1996). Their model focusses exclusively on the employment choice. It is more costly for the politician to influence the employment level when the firm is privatized as the employment decision then lies with the manager and the shareholders of the firm.

The present model considers different government types. The voter-oriented government is best comparable to the government in Boycko, Shleifer, and Vishny (1996), as it is interested in high employment: Also in the present model, the employment effect decreases incentives to

privatize. The profit effect and the redistribution effect, however, distort incentives towards privatization. If only the employment effect were present, the results of this model would be the same as in the existing literature. Thus, the additional possibilities of redistributing profits determine the difference in the results: The incentive to redistribute government revenue leads to inefficiently high incentives to privatize. For the egoistic government, incentives to privatize arise due to its profit orientation.

**6.3. The Impact of Institutions.** After this discussion, naturally the question arises whether the government incentives may differ not only according to the government type but also depending on the economic environment in a country. Better institutions are assumed to improve the prospects of the reorganization of a firm both under privatization and restructuring. They describe a better functioning economic and bureaucratic environment: Business transactions are easier, markets are more liquid and provide more opportunities, there are more business partners and bureaucratic hurdles for investments are reduced.

For the model, this translates into the success probabilities of the reorganization of the firm both under privatization and restructuring: A reform is successful when the manager is able to reduce the production costs to the low cost level  $\gamma_g$ . The more effective the investment  $e$  of the manager, the more likely is the successful reorganization of the firm. With better institutions, a higher effort of the manager should have a higher impact. Formally, with better institutions ( $BI$ ), the marginal impact of the manager's effort decreases more slowly for higher effort levels than with weak institutions:  $p_{ee}^{BI}(e) > p_{ee}(e)$  with  $p^{BI}(0) = p(0) = 0$ . The new probability function has a lower curvature to make every marginal increase of effort more rewarding.<sup>15</sup>

For mathematical simplicity, an additional assumption is made:  $p^{BI}(e) = p(e) \forall e \leq e_U$ . A higher effort is only more rewarding under privatization. Under restructuring, the situation remains unchanged for all government types. While this makes the calculations tractable it does not change the qualitative results: In the more general case, the largest probability difference would be that under privatization,  $p_P(e_P^{BI}) - p_P(e_P)$ . Normalizing all smaller differences to zero does not destroy the qualitative results for the trade-off between privatization and restructuring.

<sup>15</sup>Comparative statics could also be done with the cost parameter  $\gamma_g$ . Yet, all results would then depend on the form of the production function as this determines the employment choices. Therefore, a discussion of these results is omitted.

For all government types, these assumptions create an advantage for privatization: The expected profits under privatization are increased. Furthermore, with a higher success probability of reform after privatization, the expected employment under privatization increases. It is thus very intuitive that incentives to privatize increase for all three governments considered in this model: Conditions 9, 16, and 23 can now all be fulfilled for larger parameter ranges.

How is the efficiency of incentives to privatize affected by better institutions? When the incentives to privatize increase more for the social planner than for the other government types, better institutions could reduce the inefficiency of the incentives to privatize.

**Proposition 6.** *For all government types, better institutions increase the incentives to privatize the firm. For both the voter-oriented and the egoistic government, better institutions reduce the inefficiency of incentives to privatize.*

*Proof.* See appendix. □

Intuitively, this result is driven by the decrease in expected unemployment under privatization: Whereas the higher profits from privatization concern all government types in the same way, the difference lies in their consideration of wages and unemployment payments.

For the voter-oriented government, the inefficiently high incentives to privatize are reduced as a higher success probability of privatization diminishes the expected redistribution losses from unemployment. Expected unemployment under privatization is now lower. The redistribution effect which distorts privatization incentives upwards, is reduced. The profit effect remains unaffected. So does the employment effect, as it compares the employment choices under restructuring. For both effects, the advantages of privatization are not considered as the effects concern differences in restructuring for the two types of government.

A similar story applies to the egoistic government: Only the labor cost effect is influenced by a better institutional environment. The unemployment effect and the profit effect remain unchanged. The distortions created by the labor cost effect are smaller with better institutions. The neglect of the positive aspects of expected wage payments is less important as expected employment under privatization increases.

6.4. **Which government is worse?** This question can be answered by a comparison of the incentives to privatize of the voter-oriented and the egoistic government:

**Proposition 7.** *Given inefficiently high incentives to privatize, the voter-oriented government has higher incentives to privatize than the egoistic government if and only if  $V_P - V_R > U_P - U_R$ :*

$$p_U \pi(L_U) - \frac{1}{1+\lambda} p_V \pi(L_V) > w(p_V L_V - p_P L_P) - (1+\lambda) \underline{w}(p_U L_U - p_P L_P) \quad (25)$$

*With better institutions, the egoistic government has less inefficient incentives.*

*Proof.* See appendix. □

By its high employment choice, the voter-oriented government diminishes the profits of the firm under restructuring. In addition, it has the incentive to give all revenues to the voters and thus incurs the efficiency losses from redistribution. Thus, restructuring is relatively more attractive for the egoistic government. On the other hand, the voter-oriented government evaluates the difference in the expected employment level between privatization and restructuring positively with the wage. In contrast to that, the egoistic government only considers the saved unemployment payments. Thus, restructuring is made relatively more attractive for the voter-oriented government. Which effect is stronger depends on the shape of the production and probability functions. It is therefore not possible to state general results.

Yet, with comparative statics, it can be shown that the incentives of the voter-oriented government are the more distorted than those of the egoistic government the better the institutional environment. To see this, look at the right hand side of condition 25. (The left hand side of inequality 25 is unaffected by a changing institutional environment.) The advantage of restructuring, higher expected employment, is valued higher by the voter-oriented government. With better institutions, expected employment under privatization is increased and this advantage of restructuring is reduced. This reduction now has a greater impact for the voter-oriented government than for the egoistic government.

With better institutions, egoistic governments are better in the sense that they choose inefficient privatization programs in less cases than voter-oriented governments. This may seem counter-intuitive: The egoistic government is not concerned about the citizens who bear the

main burden of privatization if they become unemployed. Yet, the model compares incentives to the social optimum. This is not equal to the policy choice preferred by the citizens.

## 7. EMPIRICAL OBSERVATIONS

To illustrate the results of the model with empirical observations, this section uses some data for transition countries. It is difficult to assess from the empirical observations whether there has been too much or too little privatization. Yet, the privatization progress can be measured: The EBRD index of privatization progress for large-scale enterprises ranges from +1 to +4, where +1 denotes little, and +4 denotes full privatization of large enterprises (more than 75% privately-owned capital with effective management control). The data are collected in table 3.<sup>16</sup>

With the EBRD index of privatization progress, the countries that have achieved an almost complete privatization can be identified. These countries cannot have privatized too little and are thus the obvious candidates for an investigation on inefficiently high incentives to privatize.

Which countries belong to the group of voter-oriented governments and which to the revenue-oriented ones? The decision on the privatization price distinguishes these government types: Voter-oriented governments in the model give away the firm for free to the voters. In reality, voucher privatization is such a way of distributing the ownership right of the firms among the population. Egoistic, or revenue-oriented governments sell the firm at the highest possible price. The second column of table 3 shows the predominant privatization method in a country: privatization to insiders (managers and workers of the firm), by sale of the firm, or by vouchers.<sup>17</sup>

The development of GDP does not directly measure the efficiency of privatization. However, it can capture the success of privatization programs: An efficient privatization choice should enhance growth more than if inefficient privatization programs are undertaken. Note that the data does not show when in the period from 1990 to 2001 the privatization programs were implemented. Eventual difficulties in the adjustment process thus cannot be taken into account.

For the countries with high privatization scores ( $> 3$ ), Estonia, Bulgaria, Georgia, Lithuania, Romania, and Russia show a decrease of GDP. The Czech Republic has experienced almost no

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<sup>16</sup>Schnitzer (2003), puts the privatization progress for large enterprises in relation to the change in GDP from 1990 to 2001 in that country. EBRD index from Transition Report (various years), GDP data from Madison (2001), cited from Schnitzer (2003). Unemployment data and privatization method from Transition Report (2003).

<sup>17</sup>The possibility of insider privatization is not modelled in the paper. See Blanchard and Aghion (1996).

FIGURE 3. Large-Scale Privatization on GDP and Unemployment in 2001

	Privatization Progress	Privatization Method	GDP 2001/ GDP 1990 (%)	Unemployed 2001 (% of labor force)
Czech Republic	4	voucher	102.9	8.9
Estonia	4	sale	96.7	12.6
Hungary	4	sale	112.3	5.7
Slovak Republic	4	sale	110.1	19.8
Bulgaria	3.7	sale	85.9	19.7
Georgia	3.3	voucher	39.6	11.1
Lithuania	3.3	voucher	72.3	17.4
Poland	3.3	sale	145.0	17.3
Romania	3.3	insider	83.6	8.8
Russia	3.3	voucher	69.2	8.9
Armenia	3	voucher	74.3	9.6
Croatia	3	insider	90.4	15.8
FYR Macedonia	3	insider	82.6	28.9
Kazakstan	3	sale	78.0	10.4
Kyrgyz Republic	3	voucher	69.8	17.4
Latvia	3	sale	66.8	13.1
Moldova	3	sale	34.6	7.3
Slovenia	3	insider	123.8	5.9
Ukraine	3	insider	47.1	3.7
Uzbekistan	2.7	insider	102.5	0.4
Albania	2.3	insider	122.2	14.6
Bosnia and Herzegovina	2.3	voucher	68.9	39.7
Tajikistan	2.3	sale	39.5	2.3
Azerbaijan	2	voucher	64.3	1.3
Belarus	1	insider	90.3	2.3
Turkmenistan	1	insider	95.7	n.a.

growth over that period, whereas the GDP in Hungary, the Slovak Republic, and Poland has increased substantially. Has the first group of countries privatized too much? To relate the empirical observations to the model, look at the unemployment levels in these countries.<sup>18</sup>

In the model, voter-oriented governments have too high incentives to privatize when the employment effect is weak. Then, the employment differences between privatization and restructuring cannot be too large. From the data, it is impossible to see how employment would have developed if a restructuring of the firms had been chosen instead of privatization. Still,

<sup>18</sup>There are several problems with using official unemployment statistics as they might not or in some cases not at all capture the real level of unemployment. As the data here is only used as an illustration of the theoretical results, a critical discussion of these issues is omitted.



a low level of unemployment is a sign for a weak employment effect: There is no possibility for a government to significantly increase employment. Of the countries with large privatization progress, the Czech Republic, Georgia, Lithuania and Russia have applied the method of voucher privatization. All these countries have experienced a decrease, or, in the case of the Czech Republic, only a very weak increase of their GDP.

Have these countries privatized too much? In the context of the model, the failure of privatization programs in these countries has a simple explanation: These countries have implemented too much privatization. For the governments of that countries, the incentives to privatize could have been inefficiently high when privatization did not imply a large number of unemployed. This could be true for the Czech Republic and Russia which report unemployment levels below 10% and, with caution, for Georgia, whose reported unemployment with 11.1% is relatively low. The incentive to keep the firms in state ownership to keep up employment and satisfy voters has been weak.<sup>19</sup> With its unemployment level of 17.4%, Lithuania falls out of that picture.

Estonia, Hungary, the Slovak Republic, Bulgaria, and Poland have privatized by sales of the state-owned firms. They thus belong to the group of revenue-oriented governments. In the model, also egoistic governments may privatize too much, underestimating the positive employment effects of restructuring.<sup>20</sup> All countries in this group except for Hungary have unemployment ratios of over 10%. This points to a situation where profits are valued more than employment. Then, profit-oriented governments have inefficiently high privatization incentives.

On the other hand, except for Bulgaria, these countries show a positive development of their GDP. Too much privatization here has been by far less detrimental than for the group of governments that used voucher privatization. That pattern can be explained by improving institutions: With a better economic and institutional environment, the incentives of the egoistic government are less distorted than those of the voter-oriented government. Thus, governments using privatization by sale would do that more efficiently than those using voucher privatization. For the

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<sup>19</sup>For the case of Russia, insiders of firms had advantages during the voucher privatization. Firms were predominantly owned by insiders with a vested interest in employment. This could be an additional explanation for the relatively low unemployment levels.

<sup>20</sup>Note that egoistic governments do not have to be non-democratic. They just have to value government revenue more than the utility of the voters.

EU-accession countries Hungary, the Slovak Republic, and Poland, this explanation seems to hold: These countries face a high pressure to improve their institutions to meet EU standards.

Another explanation could be that privatization by sales led to ownership structures that supported a more efficient reorganization of the firms after privatization: Firms are often sold to large and/or foreign investors with an interest in profit maximization. Under voucher privatization, either insiders, as in Russia, or badly regulated investment funds with other interests than reorganizing the firms gained control.<sup>21</sup>

It is very hard to track down the results of the model in the data. A detailed study would be needed to assess the influence of the employment effects of privatization. These are crucial for the results of the model. Yet, empirical studies on the employment consequences of privatization programs are rare. Megginson and Netter (2001) consider an analysis of the employment consequences of privatization as one of the three most important empirical research projects.

There are a few empirical studies that ask for the reasons why governments choose privatization. In the rest of this section, their findings are related to the results of the present model. In the model, all types of government can have inefficiently high incentives to privatize. Thus, the result does not only depend on the objective function of the government. The two government types considered are stylized and extreme versions of existing governments. As both extreme government types have the same inefficiently high incentives to privatize, it is plausible that also intermediate forms will show a similar incentive structure.

This is not in line with the empirical findings of Bortolotti, Fantini, and Siniscalco (2003). In their cross-section study that contains both developed and developing countries, they find that the probability of privatization significantly increases for democracies. Yet, the mechanism driving the result is different: In their study, democracy is an indicator for political stability. This attracts foreign investors which are necessary for a profitable privatization. In the present model, employment effects are the driving force behind the inefficiently high incentives to privatize. Furthermore, the model analyzes the *incentives* for privatization. It could well be that a non-democratic government has very high incentives to privatize but is not able to implement the privatization programs because it is unable to find investors.

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<sup>21</sup>Schnitzer (2003) discusses the importance of privatization strategies for the success of privatization programs.

The study also reports that the probability of privatization significantly increases with a country's debt. Revenue creation is identified as a strong incentive for privatization. This very intuitive mechanism is neglected in the present model. An inclusion of that motive would further reinforce the incentives to privatize.<sup>22</sup> With any small distortions concerning debt servicing also the result of inefficiently high incentives to privatize would be strengthened.

A finding by Bortolotti and Pinotti (2003) is that a higher number of veto players in a political system decreases the probability of privatization. Intuitively, without opposition, all kinds of political reforms are easier to implement. The present model omits the presence of veto players.<sup>23</sup> It is plausible that the inefficiency of incentives to privatize can be reduced by such veto players. Nevertheless, the present model makes an important contribution: It analyzes the incentives of governments to privatize for different objectives of the political leaders. Veto players might either distort these incentives or create obstacles for the implementation of a privatization program.<sup>24</sup>

## 8. CONCLUSION

Why do governments want privatization? When the political leaders are voter-oriented, they may privatize too much when higher employment under restructuring does not substantially increase the expected income of the voters. Furthermore, as in Biais and Perotti (2002) and Schmidt (1996), they use underpricing. Privatization is then used as a way to "buy" voters. Egoistic governments have inefficiently high incentives to privatize due to their profit orientation: This makes them neglect the positive aspect of employment that is higher under restructuring.

The results are contrary to the findings of Boycko, Shleifer, and Vishny (1996) that imply that self-interested governments have no incentive to privatize. Their model has a different focus, namely, to explain why privatization can improve efficiency. The political leadership is interested in a high employment level. It is more costly to influence the employment level of the firm when the firm is privatized. In the present model, the political leadership has additional possibilities of action: the choice of the privatization price and the redistribution of profits of the

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<sup>22</sup>Yarrow (1999) theoretically builds on that argument.

<sup>23</sup>The most obvious candidates are the unemployed: They would play a role if elections would be decided retrospectively, that is, not on the basis of the expected but of the realized income of voters.

<sup>24</sup>Bennedsen (2000) has a model of privatization and employment choice with interest groups. However, his focus does not lie on the incentives for privatization.

state-owned firm to voters. These elements are important factors of the privatization decision. When they are taken into account, the model yields the contrary results. Furthermore, different types of government are considered. Thus, it is possible to distinguish the influence of different government objectives on the privatization decision: Both the orientation on political power and on government profits can lead to inefficiently high incentives to privatize.

In the model, private investors have incentives to reorganize the firm. In reality, however, this might be otherwise: When a firm is privatized to insiders of the firm, they may have interests other than efficient production. When there is a large group of investors, they may encounter monitoring problems. In such cases, privatization could not only be triggered by inefficient incentives but would also have detrimental consequences. Managers and employees but also large investors play a powerful role in any privatization decision. The influence of pressure groups is closely related to the choice of the privatization strategy. This is an interesting topic for further research: Schnitzer (2003) points out that a wrong privatization strategy could create or strengthen pressure groups that might be an obstacle to future necessary reforms. Possibly, a dynamic framework could best capture this idea.

For all government types, the inefficiency of privatization incentives is reduced with a better institutional environment. This leads to the conclusion that privatization is more efficient in countries with a developed economic environment. Also, privatization projects that are enforced by outside pressure are less detrimental in well-developed economies. It follows that privatization programs in less developed economies should be considered with more caution. From a political economy point of view, it is not clear whether privatization in such countries enhances welfare.

The program of the World Bank to make privatization a prerequisite for successful economic reforms is not supported by this model. The results show that privatization cannot be the panacea for efficiency problems in the state-owned sector. Wrong incentives can distort the privatization outcome in a way that makes this measure undesirable. A close examination of the economic situation in a country and the success probabilities of reforms is needed in order to assess whether privatization programs are able to improve a country's situation.

## 9. APPENDIX

## 9.1. Proof of Proposition 6.

*Proof.* For the welfare-oriented government with better institutions, it is optimal to choose privatization whenever

$$p_P^{BI} \pi(L_P) - p_R \pi(L_R) > (w + \lambda \underline{w})(p_R L_R - p_P^{BI} L_P) \quad (26)$$

It is easy to see that with  $p_P^{BI} > p_P$ , the left hand side of the equation increases whereas the right hand side decreases. Thus, the social planner unambiguously chooses more privatization. This is because the larger success probability for privatization programs both increases the profits from privatization and reduces the expected unemployment. For the same reasons, the incentives for the voter-oriented government change exactly in the same way: It privatizes in more cases.

$$p_P^{BI} \pi(L_P) - \frac{1}{1 + \lambda} p_V \pi(L_V) > w(p_V L_V - p_P^{BI} L_P)$$

To see that the effect is stronger for the welfare-oriented government, consider the following condition for the voter-oriented government. The voter-oriented government has inefficiently high incentives to privatize if and only if  $V_P - V_R > W_P - W_R$ . This is the case when

$$p_R \pi(L_R) - \frac{1}{1 + \lambda} p_V \pi(L_V) + \lambda \underline{w}(p_R L_R - p_P^{BI} L_P) > w(p_V L_V - p_R L_R)$$

The only term that changes with an increasing  $p_P$  is  $\lambda \underline{w}(p_R L_R - p_P^{BI} L_P)$ . This term decreases with  $p_P$  as the higher expected employment under privatization reduces the efficiency losses of redistribution. Overall, the condition thus becomes tighter. This means that the voter-oriented government has inefficiently high incentives to privatize for smaller parameter ranges.

Also the egoistic government has higher incentives to privatize: Higher expected profits under privatization and lower unemployment costs both drive the result in the same direction.

$$p_P^{BI} \pi(L_P) - p_U \pi(L_U) > (1 + \lambda) \underline{w}(p_U L_U - p_P^{BI} L_P)$$

Also the inefficiently high incentives for the egoistic government decrease with  $p_P$ : The egoistic government has inefficiently high incentives to privatize if and only if  $U_P - U_R > W_P - W_R$ . This is the case when

$$w(p_R L_R - p_P^{BI} L_P) + \lambda \underline{w}(p_R L_R - p_U L_U) > p_U \pi(L_U) - p_R \pi(L_R) + \underline{w}(p_U L_U - p_P^{BI} L_P)$$

Here, the changing terms are also the ones concerning the now higher expected employment level: If  $w(p_R L_R - p_P^{BI} L_P) - \underline{w}(p_U L_U - p_P^{BI} L_P)$  has decreased with respect to the case with  $p_P$ , the above condition is unambiguously tighter:

$$w(p_R L_R - p_P^{BI} L_P) - \underline{w}(p_U L_U - p_P^{BI} L_P) = w p_R L_R - \underline{w} p_U L_U - p_P^{BI} L_P (w - \underline{w})$$

The last term increases with  $p_P$ . Thus, the above condition has become tighter for the egoistic government.  $\square$

## 9.2. Proof of Proposition 7.

*Proof.* Condition 25 is derived from conditions 11, 15, 18, and 22. To see that the incentives for the egoistic government improve faster with better institutions, see the condition with  $p_P^{BI}$ :

$$p_U \pi(L_U) - \frac{1}{1+\lambda} p_V \pi(L_V) > w(p_V L_V - p_P^{BI} L_P) - (1+\lambda) \underline{w}(p_U L_U - p_P^{BI} L_P)$$

The left-hand side of this condition is not affected by a change in the institutional environment. The right hand side can be re-written as  $w p_V L_V - (1+\lambda) \underline{w} p_U L_U - [w - (1+\lambda) \underline{w}] p_P^{BI} L_P$ . Only the last term increases with better institutions, as  $p_P^{BI} > p_P$ . This means that the left hand side of condition 25 is reduced with better institutions. The voter-oriented government has higher incentives to privatize than the egoistic government for a larger parameter range, the better the institutional environment in the economy.  $\square$

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