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Abstract

Political involvement in the operation of an enterprise, whether it is private or state owned, creates opportunities for interest groups to influence the allocation of resources. I analyze how the influence externality arising from the interest groups' lobby activities disables the Coase Theorem. Then I proceed to investigate how the allocation of property rights between a government and a group of private owners determines the equilibrium allocation of resources in a firm. In other words, I provide a theory of why ownership matters.

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1 Introduction

Privatization programs, whether in transition economies, in developing countries or in developed market economies, are often motivated by an urge to depoliticize economic activities and to increase efficiency in resource allocation. For instance, in the former communist countries, the depoliticization of the economy through transfer of ownership is often regarded as the single most important step to improve efficiency in the operation of enterprises (Frydman and Rapaczunski 1993, and Boycko *et.al.* 1995).

There is by now a significant body of world-wide evidence documenting the inefficiency of many state owned enterprises (see e.g. World Bank 1995 and 1997 and Boycko *et.al.* 1996). Observers have suggested that such inefficiencies are closely related to the political process. The problems are exaggerated by the extreme kind of separation of ownership and control existing in state owned enterprises: the taxpayers, who are the ultimate claimants to the cash flow, have almost zero influence on the controlling managers in the firm.

While the politically induced efficiency cost is broadly accepted, it is still an open question, and the main topic of this article, why transfer of ownership changes this channel of inefficiency. In the words of Frydman and Rapaczynski 1993:

> "The assumption underlying the claim about the effectiveness of privatization as an instrument of depoliticization is that it is somehow more difficult for the state to use its political power on behalf of special interests that cannot achieve their objectives through the market, if the state does not own the enterprises to which these special interests raise their claims. Insofar as certain forms of rent-seeking are concerned, such as patronage appointments, for example, this assumption is warranted. In general, however, the ordinary regulatory powers of the state provide more than sufficient means for the state bureaucrats to dispense their largesse to any special constituency, such as management, labor, or party affiliates, without the additional power deriving from state ownership. Under special political and economic conditions, subsidies to private enterprises are in

fact not necessarily more difficult or infrequent than those to state companies,...".

The key issue analyzed in the following is precisely why transfer of ownership "depoliticize" the management of an enterprise. I investigate, in a framework of political involvement, how the distribution of property rights affects the allocation of resources in firms. The novel feature in the analysis arises from the simple observation that political decision making can be influenced by interest groups, but not all agents are sufficiently organized to be able to exploit it. This creates an *influence externality*, because the parties with influence opportunities do not internalize all the costs and benefits from their actions. Transfer of property rights affects allocation of resources through changing the size and the operation of the influence externality. Even though privatization does not remove the politicians' interest in the enterprise, it does affect the actions of organized interest groups. Furthermore, these changes in the interest groups' lobby activities influence the politicians' prefered resource allocation.[1]

The analysis takes the distribution of control and cash flow as given and derives the level of unproductive excess labor and the amount of subsidy received from the government. First, I show how the distribution of cash flow between the government and the private owners affects the resource allocation in the firm. I assume the benefit of inefficient labor allocation is extracted by an influence-seeking union. When the disorganized taxpayers are residual claimants, the cost of inefficient labor allocation is not internalized by any party with access to influence the government. A transfer of cash flow to private owners internalizes the cost in the owners' influence activity and this increases efficiency in labor allocation.

Second, I show how control matters using two additional features of the formalization of political involvement. Whereas interest groups make side-

[1] Bolton 1995 suggests the separation of ownership and control in a state owned enterprise is not essentially different from a private firm. I argue the opposite in this paper. Owners possessing a non-trivial part of the cash flow in private firms organize and influence the control holding managers. In state owned enterprises the cash flow belongs to the disorganized taxpayers, each of whom possesses a trivial part of the total cash flow. The taxpayers cannot overcome the free-rider problem of organizing themselves and, therefore, cannot influence the control-holding managers.

payments to the government, politicians transfer tax-financed resources to the interest groups. Furthermore, it is assumed that interest groups cannot costlessly merge, i.e. side-payments between interest groups are costly. In this setting, it is shown that a transfer of control from the government to the private owners improves efficiency in labor allocation, because it increases the union's cost of inducing excess employment through lobby activities.

An interesting feature of the model is its ability to explain the observation that privatizing a firm can unite workers and management in lobbying for the subsidy. Under private control, there can exist an equilibrium where the owners accept inefficient employment allocation in trade for receiving a subsidy and the union lobbies the government to give the subsidy to the firm. The existence of this equilibrium emphazises that transferring control to the owners in one area, such as labor allocation, increases their ability to affect other policy areas, such as allocation of subsidies. Furthermore, since this equilibrium depends on the government possessing a sufficiently large amount of cash flow in the firm, the analysis illustrates the danger of transferring control rights to private owners without transferring cash flow rights.

This paper relates to several distinct literatures. In the positive literature on privatization, Shleifer and Vishny 1994 study a game between a politician interested in excess employment for political reasons and a manager (private owner) of a firm. They compare transfer of property rights under three different bargaining environments: no restrictions on bribes, where property rights are neutral, as the Coase Theorem predicts; no bribes allowed; and, finally, an exogenous "decency" restriction on how large a subsidy the politician can offer the firm.[2] In a simpler, but similar model,

[2]The key difference between the Shleifer and Vishny 1994 approach and my approach is the way the externality due to an absent player works (i.e. the Treasury in their model and the taxpayer here). Shleifer and Vishny assume the marginal cost of taxation is different from one. This induces an asymmetry at the bargaining table since the share of the cost borne by the politician is evaluated differently from the share borne by the manager. However, the optimal choice of excess labor is through the tax function linked to the optimal amount of subsidy. By construction, there is a unique level of optimal excess employment and the amount of subsidy acts as a buffer. This implies that equilibrium excess employment is neutral towards the distribution of cash flow rights. The effect of introducing the decency constraint is to block the buffer role of the subsidy. The decency

Boycko *et.al.* 1996 analyze the effect of privatizing when side-payments are not feasible. The key assumption for deriving non-neutrality of property rights is that the political cost of lost profit differs from the political cost of giving out a subsidy and both are lower than the private cost of lost profit. In the present paper, the cost of lost profit and the cost of giving a subsidy are both equal to the private cost of lost profit and the manager is allowed to influence the politician.[3]

Extensive form games of special interest groups' influence on economic policy are by now a standard approach in the political economy literature (see the survey by Persson 1998). Simple contribution games have been used to study a wide range of topics, e.g. trade theory (Grossman and Helpman 1994 and 1996) and public finance (Dixit, Grossman and Helpman 1997). A key feature in these models is the government's biased accountability towards agents organized in interest groups: the policy outcome is as if the government chooses policy to maximize a weighted average of some representative voter's welfare (e.g. the average or the median voter) and the special interest groups' welfare.[4]

The contribution of the present paper is to use the contribution model to understand why ownership matters. Furthermore, in Section 5, I study the case of transferring control to one of the interest groups. To my knowledge this is the first analysis of control allocation in contribution games.

Let me finally declare what this paper is not about. As stated above, I take the distribution of property rights as given and does not directly

constraint is, therefore, a necessary condition for non-neutrality of cash flow rights.

[3]A different normative approach to privatization has been to focus on how information structures change with ownership, see Laffont and Tirole 1991, Schmidt 1996, Shapiro and Willig 1993 and Vickers and Yarrow 1988 (Chapter 2). This literature emphasizes both how the ability to construct optimal incentives schemes under asymmetric information and how the ability to monitor production efficiency depend on ownership structure. In the present paper there is symmetric information; however, ownership matters due to the influence externality in the model.

[4]Other papers have extented these simple contribution games to investigate the interaction between election processes, legislative institutions and the activities of special interest groups. See papers by Persson and Tabellini 1996 for the study of federal fiscal constitutions and Persson *et.al.* 1997 for the case of separation of powers and political accountability.

address which incentives politicians have to change this distribution. That is, I do not address political incentives to privatize or nationalize.[5]

The next section illustrates the main insights of the paper in a simple bargaining example. The purpose of this example is to highlight the implicit assumptions in the chosen extensive form of the political ownership game and to provide a clear exposition of how I disable the Coase Theorem. Readers confident with contribution games may wish to proceed directly to Section 3 where I set up the model. Section 4 analyzes the case where the government possesses control rights and where cash flow rights are transferred from the government to the private owners. Section 5 analyzes the effect of giving control rights to the private owners. In Section 6, I enlarge the strategy space of the interest groups. Finally, conclusions are drawn in Section 7.

2 Political Ownership and the Coase Theorem - a simple example

The political ownership game defined in the next section is a non-cooperative contribution game. The present section provides a simple bargaining example which illustrates the key insight from the rest of the paper and highlights the implicit assumptions in the chosen extensive form of the contribution game. The simplicity of the example facilitates the comparison with the celebrated neutrality result of Coase 1960.

Consider the decision to implement a project $\bar{l}$. The reader may think of $\bar{l}$ as unproductive excess employment in a firm. The decision can be taken either by an agent G (for government) or by an agent O (for private owner). The project yields a benefit of 7 to an agent U (for union). The cost of the project is 8 and is split between O and an agent T (for taxpayer), such that agent O pays $\alpha 8$ and agent T pays $(1-\alpha)8$. Agent G's rent is equal to the

[5]Other important issues not dealt with in this paper are the role of competition and the question about restructuring. Efficiency improvement triggered by increased competition is a frequently mentioned argument for privatization, as emphasized by Vickers and Yarrow 1988 and others. For the question about privatization and firms' incentives to restructure, see Aghion *et. al.* 1994 and Aghion and Blanchard 1996.

project's social surplus, defined as the sum of all the other agents' rent, i.e. equal to -1.

In a framework characterized by transferable utility and costless bargaining between all agents, it is well-known from the Coase Theorem that neither the distribution of cash flow rights (that is the size of α) nor the distribution of control rights (that is, if either G or O decide on the project) matter for the final decision to implement the project. The agents make the decision that maximizes their joint surplus and this surplus is independent of the allocation of property rights. Hence, the project is never implemented in a Coaseian world.

The political framework restricts side-payments and negotiations between the agents. The first restriction is that agent T is absent from the negotiation table. This assumption suffices to show the first key insight of the paper: the project decision is not neutral towards the distribution of cash flow rights between agent T and agent O. Through negotiations, the three remaining agents choose the decision that maximizes the sum of their welfare. The project is undertaken if and only if $7 - \alpha 8 - 1 > 0 \Leftrightarrow \alpha < \frac{3}{4}$. Thus, a transfer of cash flow rights from agent T to agent O improves efficiency in the project decision. The intuition is simple: when T is the sole residual claimant ($\alpha = 0$), the cost of the project is represented once at the negotiation table through G's preferences. The benefit is represented twice, as it is incorporated in G's preferences and in U's preferences. The decision is, therefore, biased toward U's preferred decision. When O is the sole residual claimant ($\alpha = 1$) the cost has the same weight as the benefit, which implies that the socially efficient decision is taken.

The second issue to be analyzed is why it matters whether G or O possesses the decision right. In a Coaseian world of costless bargaining, the final decision on project implementation does not depend on whether control is allocated to G or O, since both agents participate in the negotiations.[6] The political framework assumes:

· O and U can make side-payments to G.

[6] Obviously, it matters if control is allocated to agent T, but this conflicts with the intuition of why agent T is absent from the negotiation table.

· G can only give a subsidy to the firm paid for by T.

· Side-payments between U and O are costly.

Interest groups (here agents O and U) offer contributions to political parties. However, in democracies it is less common for politicians to make side-payments to interest groups using their private money. Instead politicians use tax-financed resources to pay back interest groups for their contributions.

If side-payments between O and U were costless, we would be back in a Coaseian world where the allocation of control between G and O does not matter. Hence, the control analysis in the present paper is relevant whenever O cannot completely internalize U's preferences through side-payments. I show below that non-neutrality of control rights arises whenever side-payments from U to O are costly.[7] In the model of the following sections, I stick, for reasons of tractability, to the extreme assumption that this cost is prohibitively large, so side-payments between interest groups never occur. However, the two interest groups may still gain from negotiating and coordinating their actions.

The extensive form of the game in the next sections assumes that the three negotiating agents use a two-stage bargaining procedure. In stage 1, U and O commit to conditional offers to G. In stage 2, G chooses its policy.[8]

First, let G control the project decision. U and O commit to conditional payments in stage 1 and G decides on the project and the level of subsidy in stage 2, taking these payments into account. G implements the project if U's payment in the case of project implementation minus G's utility loss

[7] Costly side-payments arise, for example in cases where some of the payment from U is in time. Assume the benefit of the project is partly a monetary reward to the core-members of the union and partly a non-monetary benefit to a broader group of agents loosely affiliated with the union (e.g. family members and the local community). Due to wealth constraints, the latter group may be restricted from paying monetary contributions. Instead they can offer voluntary work in exchange of the project. Political parties absorb contributions in money and in time (campaign organizations, support in rallies, writing letters to the editors of national newspapers, etc), whereas the private owners have little use for non-monetary contributions.

[8] The following arguments focus on the intuition and postpone the formal definitions of strategies and equilibrium to the subsequent sections.

from implementation exceeds O's payment in the case of no implementation. Thus, U is able to trigger the project by offering more than O's payment plus 1. I am looking for the highest value of α for which the project is implemented. U offers up to 7 for the project and O offers up to $\alpha 8$ to avoid the project. The project is implemented if $7 - 1 > 8\alpha$ or whenever $\alpha < \frac{3}{4}$. Independent of this, G provides the subsidy to the firm whenever O asks for it.

Second, let O control the project decision. Now, in stage 1 O offers both money and a project decision conditionally on the subsidy. In stage 2, G decides on providing the subsidy, taking into account the impact on payments and implementation decision. O's best offer consists of a commitment not to implement the project and to ask G for the subsidy. U is still willing to pay up to 7 to G for the project; however, G is not able to trigger the project implementation by providing the subsidy. Hence, the project is not implemented. Control matters because it increases O's power in the bargaining process. Since O receives the subsidy for free and is able to commit to a take-it-or-leave-it offer, she has no incentive to implement the project.

Introducing costly side-payments between U and O does not destroy the non-neutrality of control rights. However, the outcome of the game depends on which assumption is taken about the agents' outside options. For simplicity, assume G has a veto right, i.e. G must receive non-negative utility. Furthermore, assume that a one dollar side-payment from U to O is worth $\beta \leq 1$ dollar to O. Again, I look for the highest value of α for which the project is implemented. This happens when U offers the government a payment of 1, and O a payment of 6, conditional on project implementation. If O offers to G to implement the project conditionally on receiving the subsidy, then O receives $\beta(7-1) - \alpha 8 + \alpha 12$. If she does not implement the project and asks for the subsidy, she receives $\alpha 12$. She prefers to implement the project if $(7-1)\beta - \alpha 8 + \alpha 12 > \alpha 12$, or whenever $\alpha < \frac{3}{4}\beta$. Hence, control matters whenever side-payments are costly (i.e. whenever $\beta < 1$).[9]

[9]Notice, control matters even if G does not have a veto right. In this case U does not

The third issue to be analyzed is the possibility of inefficient project implementation under O control. This can happen if the subsidy is socially costly. Assume side-payments between U and O are not feasible and the subsidy is worth only 10 to the project's residual claimants, but that T's cost remains 12. If O commits to not implementing the project, she must offer G at least 2 to receive the subsidy, which gives her at most $\alpha 10 - 2$. An alternative strategy is to offer zero contributions and project implementation if G provides the subsidy. U is now able to trigger the project by offering G a payment of 3 if G gives the subsidy to the firm and zero if not. In stage 2, G provides the subsidy since it is compensated for the welfare loss from the project and the subsidy. O's utility is $\alpha 10 - \alpha 8$. O prefers this outcome if $\alpha 10 - \alpha 8 > \alpha 10 - 2 \Leftrightarrow \alpha < \frac{1}{4}$. U is also better off, since it receives $7 - 3 = 4$.

O trades the project for the subsidy and both O and U are strictly better off than if the project was not implemented. Transferring control rights aligns the interests of O and U and makes it valuable for the two interest groups to coordinate their strategies. Social efficiency in project implementation is established in this case by transferring more cash flow from agent T to agent O. The conclusion is that a transfer of control rights without a transfer of cash flow rights can be socially costly.

3 The Model

Consider an economy with a single firm and a continuum of agents, normalized to one. The agents are divided into three groups: a fraction n_u belongs to a worker union, which organizes all the workers in the firm; a fraction n_o belong to the group of private owners (called the owners), i.e. this group possesses rights to the cash flow from and/or control of the firm; and finally, a fraction $(1 - n_u - n_o)$ do not have any specific connection with the firm. For simplicity, I call the last group of agents taxpayers (even

need to compensate G for the welfare loss due to project implementation and can pay up to 7 to O. The condition for project implementation becomes $7\beta - \alpha 8 + \alpha 12 > \alpha 12 \Leftrightarrow \alpha > \frac{7}{8}\beta$. Hence, there may even be more project implementation under private control if $\frac{7}{8}\beta > \frac{3}{4}$ or $\beta > \frac{6}{7}$.

though workers and owners pay taxes too).

Assumption 1 (Contractual Incompleteness).
a) Resource allocation can only be contracted for in the current period.
b) Cash flow and control rights are long term contractible.

Assumption 2 (Influencing Externality).
a) The union and the group of private owners can influence the government through lobbying activities.
b) The taxpayers are not able to overcome the free rider problem in establishing an interest group.

Assumptions 1 and 2 are both fundamental features of most political processes. Assumption 1 reflects the difficulties in enforcing detailed contracts over longer periods relating to policy issues which are part of the ongoing political process.[10] Assumption 1 implies that at some initial date property rights are established. I take the allocation of property rights as exogenously given and focus on the connection between the distribution of property rights and the allocation of resources.

Assumption 2 reflects the fact that politicians can be influenced, but only agents with a specific interest in a particular policy issue can overcome the free rider problem of creating an interest group and use this influence opportunity. This is well documented in most studies of political organizations (see e.g. Olson 1965 and Wilson 1989). Assumption 2 introduces an externality in the influence mechanism, since the union and the owners do not internalize all the rent from influencing the government. I avoid the question of what determines the equilibrium number of active interest groups and refer the reader to the work of Mancur Olson.

There are two resources to be allocated in the firm: excess labor and a subsidy. Let $l \in L \equiv \{0, \bar{l}\}$, $\bar{l} > 0$, be the amount of excess labor in the firm.

[10] Assumption 1 distinguishes my approach from the standard incomplete contract model of ownership (see Hart 1995 and - in the context of private or public provisions of services - Hart, Shleifer and Vishny 1997). The latter model focuses on non-contractibility of certain control variables and it is assumed that ex post bargaining is efficient between all relevant agents. In the present paper, while using incomplete contracts, I emphasize the role of the political process when governments are involved in the operation of firms.

For simplicity, it is assumed that excess labor does not contribute to the firm's output. The exogenously given wage level is normalized to one, thus the cost of excess labor is equal to l. The subsidy, $s \in S \equiv \{0, \bar{s}\},\ \bar{s} > 0$, is a transfer from the government to the firm.[11] There is a social cost of giving the subsidy, such that the subsidy is worth only rs, $r < 1$, to the firm. The social cost may be a transaction cost of using the banks; an opportunity cost of financing the government's activities through distortionary taxes; or, it may be money stolen on the way from the central bank to the firm. I assume that the cost $(1 - r)s$ does not contribute to social welfare.

The firm produces a profit when $l = s = 0$. Since this basic level of profit does not play any important role in the following analysis, it is without loss of generality normalized to zero. Let $\alpha, 0 \leq \alpha \leq 1$, be the share of cash flow from the firm received by the private owners and let $1 - \alpha$ be the share of cash flow received by the government's budget. The parameter α, therefore, determines the distribution of cash flow rights. The distribution of control rights is as follows: the government controls the amount of subsidy at any time and the level of excess labor can either be controlled by the government (Section 4) or controlled by the private owners (Section 5).

The tax requirement, T, is a function of excess labor, the amount of subsidy, and the distribution of cash flow,

$$T(l, s) = (1 - \alpha)l + (1 - r(1 - \alpha))s. \tag{1}$$

The Treasury pays its share of the cost of excess labor and pays the pays subsidy to the firm, but it receives a share of the benefit of this subsidy afterwards. It is assumed that taxes are distributed equally between all agents in the economy.[12]

[11] The choice of a discrete model is for expositional reasons. It is possible to extent the model to continuous labor and subsidy levels. Such an extension would complicate the presentation - particularly in Section 5 below - without yielding much additional insight.

[12] In the present analysis, as in most other political economy models, it is implicitly assumed the government controls a limited set of policy instruments. In the absence of restrictions on the set of instruments there would be no incentives to use inefficient resource allocation to transfer rent between agents. In the same spirit, if the government could set a firm-specific corporate tax rate, the sale of cash flow in the firm would be orthogonal to the net cash flow received by the residual claimants of the firm. By choosing

The union derives a benefit $bl, 0 < b < 1$, from excess employment and pays its share of the taxes. The union's preferences over l and s are,

$$W_u(l,s) = bl - n_u T(l,s). \tag{2}$$

I do not explicitly model how the benefit of employment arises: it may reflect friction in the matching process between firms and workers, institutional restrictions such as minimum wages, or it may reflect the increased power the union receives from having more members employed.[13][14]

The group of owners receives a fraction of the firm's cash flow and pays taxes,

$$W_o(l,s) = \alpha(-l + rs) - n_o T(l,s). \tag{3}$$

Finally, a single taxpayer does not receive any benefit from the firm and therefore has preferences given by $W_t(l,s) = -T(l,s)$.

The government represents all agents in the society equally; hence, its direct utility from l and s is given by,

$$\begin{aligned} W_g(l,s) &= W_u(l,s) + W_o(l,s) + (1 - n_u - n_o)W_t(l,s) \\ &= -(1-b)l - (1-r)s. \end{aligned} \tag{4}$$

The two kinds of social cost play an important role in the following analysis. The positive social cost of labor $(1 - b > 0)$ reflects that it could be used better elsewhere in the economy. The positive social cost of giving out subsidy $(1 - r > 0)$ is *not* necessary to show that the distribution of property rights affects resource allocation, but it is essential to explain why employment may be distorted in private firms too.

Social welfare is maximized when $s = l = 0$ and I denote this the *first best* outcome. The choice of first best clarifies the exposition, but it would be straightforward to introduce strictly positive social optimal employment and/or subsidy levels.

α as a given parameter it is implicitly assumed that there is a fixed corporate tax rate in the economy and the government is not able to make firm-specific taxes.

[13] As suggested in footnote 5, the utility may even be partially non-monetary and partially received by agents not working in the firm.

[14] Since the wage is assumed to be fixed, I also abstract from the important issue of which instrument to use to accommodate the union.

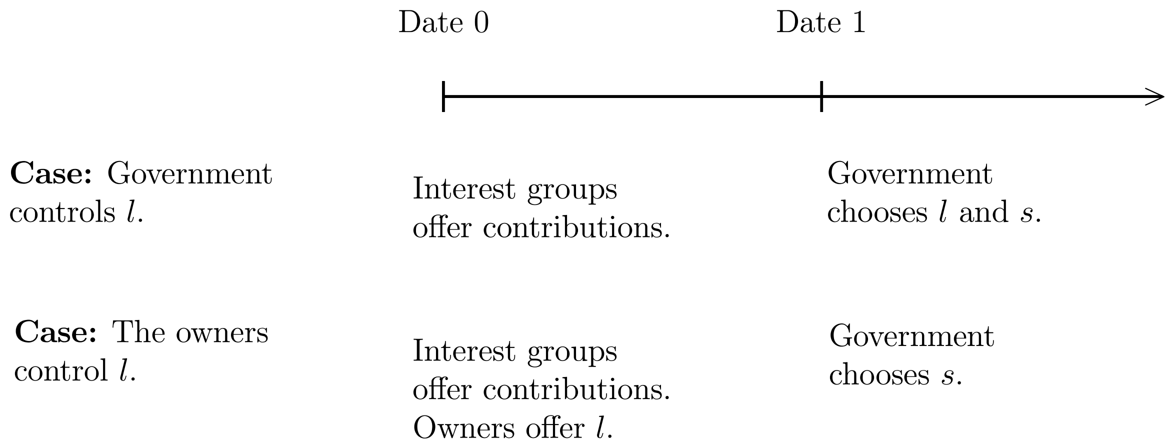

Figure 1: time line.

The influence mechanism.

The timing of the model is shown in Figure 1. At Date 0 organized interest groups make conditional offers to the government. In the case where the government controls excess labor, these offers consist of contributions, i.e. non-negative payments, conditional on the government's policy choice. At date 1 the government chooses the optimal excess labor and subsidy levels taking into account the social welfare and the conditional contributions from the interest groups. In the case where the private owners control excess labor, the owners and the union offer conditional contributions, and in addition, the owners offer conditional levels of excess employment. At Date 1 the government chooses the optimal amount of subsidy.

The union and the owners choose contribution functions, $c_u(l, s)$ and $c_o(l, s)$, defined on labor and the level of subsidy, to maximize their respective total welfare,

$$V_u \equiv W_u - c_u(l, s), \tag{5}$$

and

$$V_o \equiv W_o - c_o(l, s). \tag{6}$$

The total welfare of the government is given by a weighted sum of social welfare and contributions,

$$V_g \equiv W_g + h(c_u(l, s) + c_o(l, s)), \quad h \geq 0. \tag{7}$$

There are many reasons why a government cares about social welfare: it may wish to improve the society, it may be a way of maximizing the number of votes in an upcoming election, or it may be that the government is concerned about its reputation after leaving office. The government consists of politicians who also care about contributions. This may be because contributions enable them to capture more votes, or because contributions yield private benefits to politicians. The parameter h measures the effect of influencing through contributions. Potentially h can be very large if the parties are more interested in power or private benefits than in ideology. In particular, it is reasonable, but not necessary, to believe that h is larger than 1, i.e. the government prefers one dollar in its campaign pocket to one dollar in saved taxes.[15] [16]

Assumption 3 (Additively Separable Contribution Functions). *The union's and the owners' contribution functions are additively separable functions of excess labor and the level of subsidy.*

The assumption restricts the class of contribution functions to $c_j(\cdot,\cdot) \equiv c_j^l(\cdot) + c_j^s(\cdot)$ where $c_j^l(\cdot) : L \to R_+$ and $c_j^s(\cdot) : S \to R_+$. The assumption, which implies that the equilibrium resource allocation under governmental control is the one that maximizes the total surplus for the negotiating parties, is further discussed in Section 6.

Finally, it is assumed for simplicity that the union, in the absence of contributions from the owners, prefers to lobby for excess employment for any distribution of cash flow rights. The condition for this when $\alpha = 0$ is that the benefit from excess employment net of the union's increased tax

[15](7) can alternatively be motivated by assuming the government's objective function is the sum of the agents' total welfare and contributions,

$$\begin{aligned} V_g &\equiv V_u + V_o + (1 - n_u - n_o)W_t + \tilde{h}(c_u(l,s) + c_o(l,s)) \\ &= W_g + h(c_u(l,s) + c_o(l,s)), \end{aligned}$$

where $h = \tilde{h} - 1$ and $\tilde{h}$ is assumed to be greater than one.

[16]Grossman and Helpman 1996 show in a model where two parties compete about votes that the policy outcome will be as if the winning party maximized a sum of the interest groups' welfare and the average voter's welfare. Section 6 demonstrates that this model gives the same result.

payment $(b - n_u)\bar{l}$ exceeds the minimum contributions necessary to trigger $l = \bar{l}$, i.e. $\frac{1-b}{h}\bar{l}$. This condition simplifies to $\frac{b(1+h)-1}{h} - n_u \geq 0$.

4 Government Controls Excess Labor

In this section it is assumed that the government controls both excess labor and the subsidy. I show how the distribution of cash flow rights has real implications for the equilibrium level of excess employment and the equilibrium amount of subsidy. Changes in cash flow rights affect the fraction of costs and benefits from a given allocation of resources internalized by the interest groups, i.e. such changes alter the size of the influence externality.

The game between the government and the interest groups is formally a game of common agency (see Bernheim and Whinston 1986). The correct equilibrium concept is subgame perfect Nash equilibrium.[17] In general there exist many equilibria in this game, but they all differ in the amount of contribution given to the government. The level of excess employment and the amount of subsidy are uniquely determined in Propositions 1 and 2 below.

Lemma 1. *The equilibrium level of excess labor is independent of the equilibrium level of subsidy and the equilibrium level of subsidy is independent of the equilibrium level of excess labor.*

Proof. The government's objective function (7) is additively separable in l, s, $c_u(\cdot,\cdot)$ and $c_o(\cdot,\cdot)$. $c_u(\cdot,\cdot)$ and $c_o(\cdot,\cdot)$ are additively separable functions of l and s (Assumption 3). Finally, $V_u(\cdot,\cdot)$ and $V_o(\cdot,\cdot)$ are also additively

[17] Formally, define the set of mappings $\mathcal{C} := L \times S \to R_+$. Then $\{c_u^*, c_o^*, l^*, s^*\}$ is a subgame perfect equilibrium if and only if

1. $c_j^* \in \mathcal{C}, j \in \{u, o\}; l^* \in L$; and $s^* \in S$.
2. c_u^* maximizes V_u in $\mathcal{C}$, subject to c_o^* and $\{l, s\} = Argmax_{\{l,s\} \in L \times S} V_g$.
3. c_o^* maximizes V_o in $\mathcal{C}$, subject to c_u^* and $\{l, s\} = Argmax_{\{l,s\} \in L \times S} V_g$.
4. $\{l^*, s^*\}$ maximize V_g in $L \times S$, subject to $c_u = c_u^*$ and $c_o = c_o^*$.

I use the government's equilibrium actions and not complete strategies in the definition of an equilibrium. This is without loss of generality and saves notation later on.

separable functions of l and s because the tax function (1) is. Hence, the problem of choosing excess labor can be separated from the problem of choosing the level of subsidy. □

The separability of the two allocation problems hinges on the government controlling both l and s. This implies the government does not trade the subsidy for excess employment. I will show in the following section, that trading excess labor for the subsidy is a unique feature of private control in the present model.

Proposition 1 (Cash Flow Rights and Excess Labor).
There exists a threshold fraction of cash flow rights, $\alpha^l \equiv \frac{b(1+h)-(1+h(n_o+n_u))}{h(1-n_o-n_u)}$, *such that:*
a) If the private owners possess less than α^l *of the cash flow rights, the excess employment in the firm is strictly positive.*
b) If the private owners possess more than α^l *of the cash flow rights, there is zero excess employment in the firm.*

Proof. See Appendix. □

The distribution of cash flow rights affects the level of excess labor in the firm, because of the influence externality. The benefit from having positive excess labor is received by the union, but the cost is shared between the owners and the non-organized taxpayers. Increasing the private owners' share of the cash flow rights internalizes more of the cost in the contribution game and decreases, therefore, the equilibrium level of excess labor. When the union's lobby activity distorts social welfare, it is possible to avoid this distortion by letting another interest group with the same influence opportunity bear the full cost.

Proposition 1 provides half the answer to the puzzle raised by Frydman and Rapaczynski in the introduction. The government's incentive to overstaff state owned enterprises arises from the associated political gains. Transfer of cash flow rights does not *per se* change the government's ability to pursue politically motivated goals in the allocation of labor. Instead transfer of cash flow shifts some of the cost of these distortions from invisible taxpayers to well-organized private owners who in response lobby the government to obtain a higher efficiency in employment allocation. Hence, transfer of cash flow changes the government's optimal level of excess labor.

Proposition 2 (Cash Flow Rights and the Subsidy).
There exists a threshold fraction of cash flow rights, $\alpha^s \equiv \frac{(1-r)(1+h(n_o+n_u))}{hr(1-n_o-n_u)}$, *such that:*
a) If the private owners possess less than α^s *of the cash flow rights, the government provides no subsidy to the firm.*
b) If the private owners possess more than α^s *of the cash flow rights, the government provides the subsidy to the firm* ($s = \bar{s}$)*.*

Proof. See Appendix. □

The benefit of increasing the subsidy is split between the private owners and the budget, but the cost is fully levied on the taxpayers. A transfer of cash flow rights to the private owners increases their lobby activity and this triggers a higher subsidy to the firm.

From the treasury's point of view both l and s are subsidies to the firm. The direct subsidy $\bar{s}$ costs the treasury $(1 - r(1 - \alpha))\bar{s}$ and the excess employment costs the treasury $(1-\alpha)\bar{l}$. Thus, excess employment is an indirect subsidy from the treasury to the firm in form of lost profit. Proposition 1 and 2 show that a transfer of cash flow from the government to the private owners improves efficiency in labor allocation but may increase the socially costly direct subsidy. The effect on the total subsidy (i.e. the direct and the indirect effect) is ambiguous.

It is worthwhile to emphasize that the equilibrium resource allocation is neutral to changes in the distribution of cash flow rights between the union and the owner. This is a standard efficiency result in the contribution game literature. As Dixit *et.al.* 1997 point out this is parallel to the Coase Theorem applied to the distribution of property rights between the interest groups, since these groups all have influence opportunities. However, the interesting issue when studying ownership structure is not so much the distribution of property rights between the different interest groups, as the distribution of property rights between these interest groups and the non-organized tax payers.

Proposition 3 (Comparative Static).
a) The more agents belonging to an interest group, the less private cash flow rights are necessary to avoid excess labor and the more private cash flow rights are necessary to trigger a subsidy.
b) The more efficient the lobby technology is, the more private cash flow rights are necessary to avoid excess labor and the less private cash flow rights are necessary to trigger a subsidy.

Proof.
Part a)

$$\frac{\partial\alpha^l}{\partial(n_o+n_u)} = \frac{(h^2+h)(b-1)}{h^2(1-n_o-n_u)^2} < 0$$

and

$$\frac{\partial\alpha^s}{\partial(n_o+n_u)} = \frac{2(1-r)}{hr(1-n_o-n_u)^2} > 0.$$

Part b)

$$\frac{\partial\alpha^l}{\partial h} = -\frac{1}{h^2}\frac{b-1}{(1-n_o-n_u)} > 0$$

and

$$\frac{\partial\alpha^s}{\partial h} = -\frac{1}{h}\alpha^s < 0.$$

□

Part a) states that efficiency increases when more agents join the interest groups. The influence externality would disappear if the interest groups organized all agents in the society. In particular, this makes the case for mass privatization, defined as selling the cash flow of a state owned enterprise to a large number of private owners.[18]

Part b) states that the more efficiently the lobby mechanism works, the more difficult it is to avoid distortions from lobby activities. Efficiency of the influence mechanism is closely related to the organization of the society. One possible interpretation is, therefore, that building democratic and legal institutions that reduces the ability of special interest groups to influence politicians can improve social welfare.

[18]However, mass privatization increases corporate governance problems and this is likely to more than offset the positive effect of decreasing the influence externality. This question is not considered here.

5 Private Owners Control Excess Labor

In this section I analyze the case where the private owners control excess labor and the government controls the subsidy. I show that the transfer of control rights - given the distribution of cash flow rights - makes it less likely that excess employment will be observed and more likely that a subsidy will be given. I then proceed to study a particularly interesting equilibrium outcome, in which the private owners trade excess employment for a subsidy. This equilibrium suggests one explanation for the observation that privatization can align the insiders' preferences against the government.

At Date 0, the owners offer contributions and excess labor conditional on the level of subsidy to the government. As in the previous section, the union offers contributions conditional on the level of excess labor and the amount of subsidy. At Date 1, the government chooses the amount of subsidy, taking into account the impact on excess labor and contributions. I am searching for a subgame perfect equilibrium in this game.[19]

In general there are three different policy outcomes that can be sustained in equilibrium. The first is the *labor-for-subsidy* outcome where the owners offer excess employment conditional on receiving a subsidy from the government and the union pressures the government to accommodate the owners' demand for a subsidy. The second is the *subsidy-for-contribution* outcome where the owners choose zero excess employment and lobby successfully for a subsidy. Finally, the first-best outcome $l = 0$ and $s = 0$ can be sustained in equilibrium if the incentives to lobby are sufficiently small.[20]

[19] Formally, define the sets of mappings $\mathcal{C}^o := S \to R_+$ and $\mathcal{L}^o := S \to L$. $\{c_u^*, c_o^*, l^*, s^*\}$ is a subgame perfect equilibrium if and only if

1. $c_u^* \in \mathcal{C}, c_o^* \in \mathcal{C}^o, l^* \in \mathcal{L}^o$; and $s^* \in S$.
2. c_u^* maximizes V_u in $\mathcal{C}$, subject to c_o^*, l^* and $s = argmax_{s \in S} V_g$.
3. c_o^* and l^* maximize V_o in $\mathcal{C}^o \times L^o$, subject to c_u^* and $s = argmax_{s \in S} V_g$.
4. s^* maximizes V_g in S, subject to $c_u = c_u^*$, $c_o = c_o^*$ and $l = l^*$.

[20] With private control over l, excess labor ($l = \bar{l}$) and zero subsidy ($s = 0$) cannot be an equilibrium because excess labor is costly for the owners and they do not have any incentives to incur this cost.

The policy outcome is in general not unique and the existence of multiple equilibrium outcomes provides a potential gain from negotiation between the two interest groups. If the labor-for-subsidy and the subsidy-for-contribution equilibrium coexist, the former yields the highest utility level for both interest groups. I assume in this case the interest groups, through strategy-coordinating negotiations, trigger the labor-for-subsidy equilibrium.

The first two results in this section concern the effects of transferring control given the distribution of cash flow rights and all other parameters of the model.

Proposition 4 (Transfer of Control Decreases Excess Employment). *Transfer of control from the government to the private owners never increases excess employment and it decreases excess employment for some values of the model.*

Proof. See Appendix. □

When the government controls l, the union induces excess employment by compensating the government for the loss in social welfare and the loss in contributions from the private owners. The private owners cannot deter the union in doing this. However, when the owners possess control, they can always trigger either the subsidy-for-contribution or the first-best outcome. Excess employment is induced only if the government is compensated and the equilibrium makes the owners better off. The union's increased cost and unchanged benefit of triggering excess employment under private control improves (weakly) efficiency in labor allocation.

Proposition 5 (Transfer of Control Increases the Subsidy). *Transfer of control from the government to the private owners never decreases the subsidy and it increases the subsidy for some values of the model.*

Proof. Assume the owners offer $l = 0$ independent of the subsidy level. This implies that the agents are in the subsidy game analyzed in the proof of Proposition 2. Furthermore, since $s = \bar{s}$ is a necessary condition for $l = \bar{l}$, there will never be a lower level of subsidy under private control.

Next, I provide an example where the subsidy increases when control rights are transferred to the private owners. Let $n_u = n_o = 0$, $h = 1$, $b = 1$, $r = \frac{3}{4}$, $\bar{l} = 2$, $\bar{s} = 4$ and $\alpha = \frac{1}{4}$. From Proposition 2 I have $\alpha^s = \frac{1}{3} > \alpha$, thus $s = 0$ when the government controls l. It is straightforward to confirm that the following is an equilibrium when the private owners control l:

$$
\begin{gathered}
s = 4, \\
l(0) = 0, \qquad l(4) = 2, \\
c_o(0) = c_o(4) = 0, \\
c_u(0,0) = c_u(0,4) = 0, \qquad c_u(2,0) = c_u(2,4) = 1.
\end{gathered}
$$

□

By choosing $l = 0$ independent of s, the owners are in the same subsidy for contribution game as in Section 4. Since this is the worst they can do, transferring control never decreases the level of subsidy. Furthermore, the owners have the option of offering excess labor for a subsidy and this option may yield positive utility for the owners even if it does not pay for them to lobby directly for the subsidy. In these cases, transferring control rights increases the amount of subsidy.

Proposition 4 and 5 provide the second half of the answer to the puzzle raised in the introduction. Transfer of control "depoliticize" the firm through increasing the power of the private owners, and changing the relative power of the interest groups affects the government's preferred outcome. Increasing the power of the private owners improves social welfare if the owners' preferences are aligned with the interest of the general society. However, it is worth emphasizing that transferring control to the owners in one area, such as labor allocation, increases their ability to affect other policy areas. In this model, other policy areas include only the allocation of the subsidy, but in general the argument applies to all policy issues affecting the welfare of the owners. Control is power and power is not neutral.

The labor-for-subsidy equilibrium suggests an explanation of the observation that after privatization both owners and unions lobby governments for more subsidy. The owners offer excess labor in exchange for a cheap subsidy. The union, benefitting from the excess labor, persuades the government to accept the owners' offer. It is therefore possible that transferring control increases the amount of subsidy without decreasing the level of excess employment. A control transfer in such special cases increases the amount of total subsidy from the Treasury to the firm. Hence, the analysis confirms Frydman and Rapaczynski's claim quoted in the introduction that "Under special political and economic conditions, subsidies to private enterprises are in fact not necessarily more difficult or infrequent than those to state companies,...".

I now provide conditions for the existence of such an equilibrium. The owners' strategy in the labor-for-subsidy equilibrium is to offer

$$l(s) = \begin{cases} 0 & \text{if } s = 0 \\ \bar{l} & \text{if } s = \bar{s} \end{cases} \quad \text{and} \quad c_o(s) = \begin{cases} 0 & \text{if } s = 0 \\ \delta & \text{if } s = \bar{s} \end{cases}$$

where $\delta \geq 0$ is some number. $\delta = 0$ is the special case where the owners do not make any contribution to the government, and the union pays all the contribution necessary to persuade the government to subsidize the firm. To support a labor-for-subsidy equilibrium, the union's contribution must make the government indifferent between subsidizing or not,

$$c_u(\bar{l}, \bar{s}) = \frac{1-r}{h}\bar{s} + \frac{1-b}{h}\bar{l} - \delta.$$

There are three additional requirements for these strategies to support a labor-for-subsidy equilibrium. First, given the owners' strategy, the union triggers the first-best outcome by offering contributions strictly less than $\frac{1-r}{h}\bar{s} + \frac{1-b}{h}\bar{l} - \delta$. Therefore, the union must receive non-negative utility in equilibrium. Second, the owners can also trigger the first-best outcome by choosing $l = 0$, so they must also receive non-negative utility in equilibrium. Finally, the owners can choose $l = 0$ and make a sufficiently high contribution to trigger the subsidy-for-contribution equilibrium. Hence, the owners must receive a higher utility in the labor-for-subsidy equilibrium than in the subsidy-for-contribution equilibrium.

The following condition characterizes the existence of a labor-for-subsidy equilibrium.

$$\bar{l}/\bar{s} \in \left[\frac{(1-r)(1+hn_u) + hn_u r\alpha}{b(1+h) - 1 - hn_u(1-\alpha)} \right. ;$$

$$min \left\{ \frac{1-r}{h(\alpha+n_o(1-\alpha))} \quad ; \quad \frac{\alpha r - n_o(1-r(1-\alpha))}{\alpha+n_o(1-\alpha)} \right\} \Bigg] . \quad (8)$$

Proposition 6 (Labor-for-Subsidy Equilibrium).
a) Condition (8) is a sufficient condition for existence of an equilibrium with positive excess employment when the private owners control excess employment.
b) If $\alpha + n_o(1-\alpha) \leq b - 1 + h(b - n_u(1-\alpha))$, then condition (8) is also a necessary condition for existence of an equilibrium with positive excess employment when the private owners control excess employment.

Proof. See Appendix. □

Equation (8) reflects the three requirements mentioned above in the case where $\delta = 0$. The first term describes the union's incentive constraint. If the ratio between $\bar{l}$ and $\bar{s}$ is too small, then the union's gain from receiving excess employment is smaller than the cost of paying taxes and lobbying the government. If this ratio is too big one of two things can happen. Either the owners' cost of paying wages to the extra workers and increased taxes to the government exceeds the cost of lobbying directly for the subsidy (second term in equation (8)) or it exceeds the owners' benefit from getting this subsidy (third term in equation (8)).

Even if a labor-for-subsidy equilibrium with zero contribution from the owners ($\delta = 0$) does not exist, it could be the case that there exists a labor-for-subsidy equilibrium where the owners offer a positive contribution. However, part b) of Proposition 6 states that this is not the case if $\alpha + n_o(1-\alpha) \leq b - 1 + h(b - n_u(1-\alpha))$.

6 Discussion of Assumption 3

Assumption 3 restricts the interest groups to additively separable contribution schemes. Before investigating this assumption, I show that allowing for more general contribution strategies does not destroy the equilibrium resource allocations sustained by additively separable contribution functions when the government controls excess labor and the subsidy:

Proposition 7.

Let the government control l and s. Given the parameter values of the model, let $(l^*, s^*) \in \{(0,0), (\bar{l}, 0), (0, \bar{s}), (\bar{l}, \bar{s})\}$ be an equilibrium resource allocation when the interest groups use additively separable contribution functions. Then (l^*, s^*) is also an equilibrium resource allocation if the interest groups are allowed to use any non-negative contribution function.

Proof. See Appendix. □

In Section 4, the set of equilibrium resource allocations using additively separable contribution functions is a subset of the set of equilibrium resource allocations using general contribution functions.[21]

The set of equilibrium resource allocations under private control in Section 5 is compared to the resource allocation under government control. Assumption 3 can, therefore, not be neutral in Section 5. However, the set of equilibrium resource allocations under private control is independent of

[21] The following example shows the existence of other equilibria when the interest groups use general contribution strategies:

$$\begin{aligned} &n_o = n_u = 0, \quad h = 1, \\ &\alpha = \tfrac{1}{2}, \quad b = \tfrac{7}{8}, \quad r = \tfrac{4}{5}, \\ &\bar{l} = 4, \quad \bar{s} = 4. \end{aligned}$$

From Proposition 1 and 2 it follows that $\alpha^s = \frac{1-r}{r} = \frac{1}{4} < \alpha = \frac{1}{2} < \frac{3}{4} = 2b - 1 = \alpha^l$. Hence, the equilibrium resource allocation using additively separable contribution functions is $(l, s) = (4, 4)$. Proposition 7 states this is also an equilibrium resource allocation when general non-negative contribution functions are permitted. However, in this case there exist other equilibria, e.g.:

$$\{(\tilde{l}, \tilde{s}), c_u(\cdot,\cdot), c_o(\cdot,\cdot)\},$$

$$\begin{aligned} \text{where,} \quad &(\tilde{l}, \tilde{s}) = (4, 0) \\ &c_u(l, s) \equiv \begin{cases} \frac{13}{10} & \text{if} \quad (l, s) = (4, 0) \\ 0 & \text{else} \end{cases} \\ &c_o(l, s) \equiv \begin{cases} \frac{8}{5} & \text{if} \quad (l, s) = (0, 4) \\ 0 & \text{else} \end{cases} \end{aligned} \tag{9}$$

In this equilibrium there is less subsidy, but the same level of excess employment. I believe this equilibrium is not natural, since the owners have an alternative strategy (e.g. an optimal additively separable contribution strategy) that a) yields the same utility level to the owners given the union's strategy, and b) forces a change in the union's strategy, s.t. the owners are strictly better off in the new equilibrium.

Assumption 3, because the owners can without loss of generality restrict themselves to offer contributions conditional only on s and these strategies satisfy Assumption 3. Furthermore, it is a best response for the union to use additively separable strategies against the owners' strategies, and any other non-additively separable best response strategy induces the same equilibrium resource allocation as the best response additively separable strategy.

To motivate the use of additively separable strategies in Section 4 I next show that the equilibrium resource allocations given Assumption 3 maximize a weighted sum of the government's and the interest groups' rents from the operation of the firm. The government's utility is weighted by 1 and the interest group's utilities are weighted by h:

$$\max_{\{l,s\}\in L\times S} W_g + h(W_u + W_o) \tag{10}$$

Substituting into equation (10) from equations (1) to (4) and observing that the problem of maximizing with respect to l is separable from the problem of maximizing with respect to s yield the following familiar conditions,

$$\begin{aligned} l &= \bar{l} \text{ only if } \quad -(1-b)\bar{l} + h(-\alpha\bar{l} + b\bar{l} - (n_o+n_u)(1-\alpha)\bar{l}) \geq 0 \\ &\Leftrightarrow \quad \alpha \leq \alpha^l \equiv \frac{b(1+h) - (1 + h(n_o+n_u))}{h(1-n_o-n_u)} \end{aligned}$$

and

$$\begin{aligned} s &= \bar{s} \text{ only if } \quad -(1-r)\bar{s} + h(\alpha r\bar{s} - (n_o+n_u)(1-r(1-\alpha))\bar{s}) \geq 0 \\ &\Leftrightarrow \quad \alpha \geq \alpha^s \equiv \frac{(1-r)(1+h(n_o+n_u))}{hr(1-n_o-n_u)}. \end{aligned}$$

Bernheim and Whinston 1986 use truthful strategies to refine the set of equilibria in a framework that contains the present model when the government controls excess labor. Truthful strategies are defined as $c_u(l,s) = max\{0, W_u(l,s) - W_u(l^*,s^*)\}$ and $c_o(l,s) = max\{0, W_o(l,s) - W_o(l^*,s^*)\}$. In general truthful strategies need not be additively separable and additively separable strategies need not be truthful. However, the set of equilibrium resource allocations when the interest groups use truthful strategies is identical to the set of equilibrium resource allocations when the interest groups use additively separable contribution strategies. This follows directly from the work of Bernheim and Whinston 1986 and Grossman and Helpman 1994. Bernheim and Whinston 1986 proves existence of an equilibrium in truthful strategies. Grossman and Helpman 1994 proves such an equilibrium must maximize equation (10). In all cases where $\alpha \neq \alpha^l$ and/or $\alpha \neq \alpha^s$, the solution to the problem in equation (10) is unique, thus the two equilibrium refinements yield the same solution.[22]

Bernheim and Whinston argue that these equilibrium resource allocations are focal because of their robustness properties. In the present analysis I use additively separable instead of truthful strategies because the latter concept is not well-defined in Section 5, where the owners possess control rights. Assumption 3, on the contrary, is well-defined under any distribution of control rights.

7 Conclusion

Political involvement in the operation of firms, whether private or state owned, creates opportunities for interest groups to influence the allocation of resources. Resource allocation transfers rent both between groups within the firm and between insiders, who are able to influence the government, and the disorganized taxpayers, who are not able to influence the government. This influence externality disables the Coase Theorem, implying that changes in the distribution of cash flow and control rights have consequences for the equilibrium allocation of resources in the firm.

In principle, transfer of cash flow and control from a government to private owners does not *per se* depoliticize a firm, since the government influences the operation of a private firm as well as the operation of a state owned firm. However, such transfers still affect the resource allocation in the firm, because it changes the abilities and incentives interest groups have to influence the political decision making.

There are at least two directions in which this analysis could be ex-

[22] It is not hard to show in the corner cases where $\alpha = \alpha^l$ and/or $\alpha = \alpha^s$ the two equilibrium refinements also yield the same set of resource allocations.

tended. First, the approach of this paper has been to assume the existence of two essentially unexplained institutions, namely a union and a government. It would be a fruitful exercise to analyze how these institutions are formed from first principles. Second, it is an obvious extension to analyze why property rights change. In my model, any government strictly prefers to control the firm - but not necessarily to own all cash flow rights - since the government always can do weakly better than under private control. To explain why firms are privatized or nationalized it is thus necessary to appeal to factors outside the model, such as pressure from international institutions. A promising way to proceed would be to introduce alternative ideologies into the government's preferences.

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Appendix

Proof of Proposition 1

Proof. I am looking for a subgame perfect equilibrium in the contribution game given the timing of the model, the value functions (5), (6), (7) and Assumption 3. Due to Lemma 1 the problem of finding the equilibrium l can be solved independently of s. Thus, I find l by solving for a subgame perfect equilibrium in the contribution game using the following value functions:

$$V_u^l(l) \equiv bl - n_u(1-\alpha)l - c_u^l(l), \tag{11}$$
$$V_o^l(l) \equiv -\alpha l - n_o(1-\alpha)l - c_o^(l), \tag{12}$$
$$V_g^l(l) \equiv -(1-b)l + h(c_u^l(l) + c_o^l(l)). \tag{13}$$

The government chooses l according to the following incentive constraint condition:

$$\begin{matrix} l=0 \\ l=\bar{l} \end{matrix} \Leftrightarrow -\frac{(1-b)}{h}\bar{l} + c_u^l(\bar{l}) + c_o^l(\bar{l}) \begin{matrix} < \\ > \end{matrix} c_u^l(0) + c_o^l(0). \tag{14}$$

Let $\mathcal{C}^l : L \to R_+$. $\{c_u^{l*}, c_o^{l*}, l^*\}$ is a subgame perfect equilibrium if and only if

1. $c_j^{l*} \in \mathcal{C}^l, j \in \{u, o\}$ and $l^* \in L$.
2. c_u^{l*} maximizes V_u^l in $\mathcal{C}^l$, subject to c_o^{l*} and $l = Argmax_{l\in L} V_g^l$.
3. c_o^{l*} maximizes V_o^l in $\mathcal{C}^l$, subject to c_u^{l*} and $l = Argmax_{l\in L} V_g^l$.
4. l^* maximizes V_g^l in L, subject to $c_u^l = c_u^{l*}$ and $c_o^l = c_o^{l*}$.

I prove existence of an equilibrium and the sufficiency part of Proposition 1. If $\alpha \le \alpha^l \equiv \frac{b(1+h)-(1+h(n_o+n_u))}{h(1-n_o-n_u)}$ it is straightforward to verify the following is an equilibrium:

$$l^* = \bar{l},$$
$$c_o^l(0) = \alpha\bar{l} + n_o(1-\alpha)\bar{l}, \qquad c_o^l(\bar{l}) = 0,$$
$$c_u^l(0) = 0, \qquad c_u^l(\bar{l}) = \tfrac{1-b}{h}\bar{l} + \alpha\bar{l} + n_o(1-\alpha)\bar{l}.$$

If $\alpha \ge \alpha^l$ the following is an equilibrium,

$$l^* = 0,$$
$$c_o^l(0) = b\bar{l} - n_u(1-\alpha)\bar{l} - \tfrac{1-b}{h}\bar{l}, \qquad c_o^l(\bar{l}) = 0,$$
$$c_u^l(0) = 0, \qquad c_u^l(\bar{l}) = b\bar{l} - n_u(1-\alpha)\bar{l}.$$

The necessity part of Proposition 1 is proved in a number of claims about the properties of any equilibrium.

Claim (1.1): $c_u^l(0) = 0$**.** Assume not. Notice that $l = \bar{l}$ and $c_u^l(\bar{l}) = 0$ can never be an equilibrium, since the owners would deviate. Then the union could do strictly better by choosing campaign function $\tilde{c}_u^l(l)$, where $\tilde{c}_u^l(0) = 0$ and $\tilde{c}_u^l(\bar{l}) = \max\{0, c_u^l(\bar{l}) - c_u^l(0)\} \Rightarrow\Leftarrow$.

Claim (1.2): $c_o^l(\bar{l}) = 0$**.** Assume not. Notice that $l = 0$ and $c_o^l(0) = 0$ can never be an equilibrium, since by assumption the union would deviate and induce excess employment in the absence of any contribution from the owners. Then the owners could do strictly better by choosing campaign function $\tilde{c}_o^l(l)$, where $\tilde{c}_o^l(\bar{l}) = 0$ and $\tilde{c}_o^l(0) = \max\{0, c_o^l(0) - c_u^l(\bar{l})\}$.

Thus, equation (14) reduces in equilibrium to

$$\begin{matrix} l = 0 \\ l = \bar{l} \end{matrix} \quad \Leftrightarrow \quad -\frac{(1-b)}{h}\bar{l} + c_u^l(\bar{l}) \begin{matrix} < \\ > \end{matrix} c_o^l(0) \tag{15}$$

Claim (1.3): $l = \bar{l} \Rightarrow c_o^l(0) \geq \alpha\bar{l} + n_o(1-\alpha)\bar{l}$ **and** $c_o^l(0) > \alpha\bar{l} + n_o(1-\alpha)\bar{l} \Rightarrow l = \bar{l}$**.** Assume the first statement were not true, i.e. $l = \bar{l}$ and $c_o^l(0) < \alpha\bar{l} + n_o(1-\alpha)\bar{l}$. In equilibrium condition (15) must be satisfied. However, the union will never pay more than necessary contribution to the government. Thus, $c_u^l(\bar{l}) = \frac{(1-b)}{h}\bar{l} + c_o^l(0) + \epsilon$ for some arbitrary small ϵ. Assume that the owners instead offered $\tilde{c}_o^l(0) = c_o^l(0) + 2\epsilon$. This triggers $l = 0$ and the change in utility for the owners is $-\tilde{c}_o^l(0) + \alpha\bar{l} + n_o(1-\alpha)\bar{l} > 0$ when ϵ is small. If the second statement was not true, the owners would strictly prefer to trigger $l = \bar{l}$ with zero contribution.

Claim (1.4): $l = 0 \Rightarrow c_u^l(\bar{l}) \geq b\bar{l} - n_u(1-\alpha)\bar{l}$ **and** $c_u^l(\bar{l}) > b\bar{l} - n_u(1-\alpha)\bar{l} \Rightarrow l = 0$**.** The proof is similar to the proof of Claim (2.3).

Claim (1.5): $l = \bar{l} \Rightarrow \alpha \leq \alpha^l$**.** From above and equation (15), $l = \bar{l} \Rightarrow c_u^l(\bar{l}) \geq \frac{(1-b)}{h}\bar{l} + c_o^l(0) \geq \frac{(1-b)}{h}\bar{l} + \alpha\bar{l} + n_o(1-\alpha)\bar{l}$. A necessary condition for $l = \bar{l}$ is that $V_u^l(\bar{l}) \geq 0$ since the union can always get at least zero utility from zero contribution. This yields,

$$V_u^l(\bar{l}) \geq 0 \Leftrightarrow$$

$$b\bar{l} - n_u(1-\alpha)\bar{l} - c_u^l(\bar{l}) \geq b\bar{l} - n_u(1-\alpha)\bar{l} - \frac{1-b}{h}\bar{l} - (\alpha + n_o(1-\alpha))\bar{l} \geq 0.$$

The last inequality is satisfied if and only if $\alpha \leq \frac{(1+h)b - (1+h(n_o+n_u))}{h(1-n_u-n_o)} \equiv \alpha^l$.

Claim (1.6): $l = 0 \Rightarrow \alpha \geq \alpha^l$**.** From above and equation (15) it follows that $l = 0 \Rightarrow c_o^l(0) \geq c_u^l(\bar{l}) - \frac{(1-b)}{h}\bar{l} \geq b\bar{l} - n_u(1-\alpha)\bar{l} - \frac{1-b}{h}\bar{l}$. A necessary condition for $l = 0$ in equilibrium is that the owners receive a higher utility than they can get from triggering $l = \bar{l}$ with zero contribution or,

$$V_o^l(0) \geq -\alpha\bar{l} - n_o(1-\alpha)\bar{l} \Leftrightarrow$$
$$-c_o^l(0) \geq -b\bar{l} + n_u(1-\alpha)\bar{l} + \frac{1-b}{h}\bar{l} \geq -\alpha\bar{l} - n_o(1-\alpha)\bar{l}.$$

The last inequality is satisfied if and only if $\alpha \geq \frac{(1+h)b-(1+h(n_o+n_u))}{h(1-n_u-n_o)} \equiv \alpha^l$.

□

Proof of Proposition 2

Proof. The reduced problem is to find a subgame perfect equilibrium in the contribution game using value functions,

$$V_u^s(s) \equiv -n_u(1-r(1-\alpha))s - c_u^s(s), \tag{16}$$
$$V_o^s(s) \equiv \alpha rs - n_o(1-r(1-\alpha))s - c_o^s(s), \tag{17}$$
$$V_g^s(s) \equiv -(1-r)s + h(c_u^s(s) + c_o^s(s)). \tag{18}$$

At Date 1 the government chooses s according to the following incentive constraint condition:

$$\begin{matrix} s = 0 \\ s = \bar{s} \end{matrix} \;\Leftrightarrow\; -\frac{(1-r)}{h}\bar{s} + c_u^s(\bar{s}) + c_o^s(\bar{s}) \;\begin{matrix} < \\ > \end{matrix}\; c_u^s(0) + c_o^s(0). \tag{19}$$

Let $\mathcal{C}^s : S \to R_+$. $\{c_u^{s*}, c_o^{s*}, s^*\}$ is a subgame perfect equilibrium if and only if

1 $c_j^{s*} \in \mathcal{C}^s, j \in \{u, o\}$ and $s^* \in S$.
2 c_u^{s*} maximizes V_u^s in $\mathcal{C}^s$, subject to c_o^{s*} and $s = Argmax_{s \in S} V_g^s$.
3 c_o^{s*} maximizes V_o^s in $\mathcal{C}^s$, subject to c_u^{s*} and $s = Argmax_{s \in S} V_g^s$.
4 s^* maximizes V_g^s in S, subject to $c_u^s = c_u^{s*}$ and $c_o^s = c_o^{s*}$.

Again the existence of an equilibrium and the sufficiency part of Proposition 2 is proved by example. When $\alpha \leq \alpha^s \equiv \frac{(1-r)(1+h(n_o+n_u))}{hr(1-n_o-n_u)}$ the following is an equilibrium,

$$s^* = 0,$$
$$c_o^s(0) = 0, \qquad c_o^s(\bar{s}) = \max\{\alpha r\bar{s} - n_o(1-r(1-\alpha))\bar{s}, 0\}$$
$$c_u^s(0) = \max\{0, \alpha r\bar{s} - n_o(1-r(1-\alpha))\bar{s} - \tfrac{1-r}{h}\bar{s}\}, \qquad c_u^s(\bar{s}) = 0.$$

If $\alpha \geq \alpha^s$ the following is an equilibrium,

$$s^* = \bar{s},$$
$$c_o^s(0) = 0, \qquad c_o^s(\bar{s}) = \tfrac{1-r}{h}\bar{s} + n_u(1 - r(1-\alpha))\bar{s},$$
$$c_u^s(0) = n_u(1 - r(1-\alpha))\bar{s}, \qquad c_u^s(\bar{s}) = 0.$$

Notice that the owners have weakly positive utility since $\alpha \geq \alpha^s \Rightarrow \alpha r\bar{s} - n_o(1 - r(1-\alpha))\bar{s} - \frac{1-r}{h}\bar{s} - n_u(1 - r(1-\alpha))\bar{s} \geq 0$.

The necessity part of Proposition 2 is proved in a number of claims about the properties of any equilibrium:

Claim (2.1): $s = \bar{s} \Rightarrow c_u^s(\bar{s}) = 0$**.** This is obvious.

Claim (2.2): $c_o^s(0) = 0$**.** Assume not. Notice Claim 2.1 and equation (19) implies that $s = \bar{s}$ only if $c_o^s(\bar{s}) > 0$. Therefore, the owners can deviate and do strictly better using contribution functions $\tilde{c}_0^s(s)$, where $\tilde{c}_o^s(0) = 0$ and $\tilde{c}_o^s(\bar{s}) = \max\{0, c_o^s(\bar{s}) - c_o^s(0)\}$.

Claim (2.3): $s = \bar{s} \Rightarrow c_u^s(0) \geq n_o(1 - r(1-\alpha))\bar{s}$ **and** $c_u^s(0) > n_o(1 - r(1-\alpha))\bar{s} \Rightarrow s = \bar{s}$**.** Assume that the first part of this claim were wrong, i.e. that $s = \bar{s}$ and $c_u^s(0) < n_o(1 - r(1-\alpha))\bar{s}$. The owners compensate the government for the high subsidy, but only just so in equilibrium, hence $c_o^s(\bar{s}) = \frac{1-r}{h}\bar{s} + c_u^s(0) + \epsilon$ for some arbitrary small ϵ. But then the union could do strictly better by offering $\tilde{c}_u^s(0) = c_u^s(0) + 2\epsilon$. The utility gain from this is $-\tilde{c}_u^s(0) + n_o(1 - r(1-\alpha))\bar{s} > 0$ when ϵ is small. If the second part of the claim was not true, then the union would strictly prefer to offer zero contribution independent of the subsidy level.

Claim (2.4): $s = 0 \Rightarrow c_o^s(\bar{s}) \geq \alpha r\bar{s} - n_o(1 - r(1-\alpha))\bar{s}$ **and** $c_o^s(\bar{s}) > \alpha r\bar{s} - n_o(1 - r(1-\alpha))\bar{s} \Rightarrow s = 0$**.** The proof is similar to the proof claim 3 when $\alpha r\bar{s} - n_o(1 - r(1-\alpha))\bar{s} \geq 0$. If $\alpha r\bar{s} - n_o(1 - r(1-\alpha))\bar{s} < 0$ then the first part follows from the non-negative constraints on the contribution function and the second part follows from that both lobby groups strictly prefer zero subsidy.

Claim (2.5): $s = \bar{s} \Rightarrow \alpha \geq \alpha^s$**.** $s = \bar{s}$ implies that $c_o^s(\bar{s}) \geq \frac{1-r}{h}\bar{s} + c_u^s(\bar{s}) \geq \frac{1-r}{h}\bar{s} + n_u(1 - r(1-\alpha))\bar{s}$. The owners reservation utility is zero, which can be triggered by giving zero contribution. Thus a necessary condition is

$$\alpha r\bar{s} - n_o(1 - r(1-\alpha))\bar{s} - \frac{1-r}{h}\bar{s} - n_u(1 - r(1-\alpha))\bar{s} \geq 0$$
$$\Leftrightarrow \alpha \geq \frac{(1-r)(1 + h(n_u + n_o))}{rh(1 - n_u - n_o)} \equiv \alpha^s$$

Claim (2.6): $s = 0 \Rightarrow \alpha \leq \alpha^s$. $s = 0$ implies that $c_u^s(0) \geq c_o^s(\bar{s}) - \frac{1-r}{h}\bar{s} \geq \alpha r\bar{s} - n_o(1 - r(1-\alpha))\bar{s} - \frac{1-r}{h}\bar{s}$. The union's utility must be higher than the utility it receives from paying taxes when $s = \bar{s}$, i.e. $-c_u^s(0) \geq -n_u(1 - r(1-\alpha))\bar{s}$. A necessary condition for this is

$$-\alpha r\bar{s} + n_o(1 - r(1-\alpha))\bar{s} + \frac{1-r}{h}\bar{s} \geq -n_u(1 - r(1-\alpha))\bar{s} \Leftrightarrow$$
$$\alpha \leq \frac{(1-r)(1 + h(n_u + n_o))}{rh(1 - n_u - n_o)} \equiv \alpha^s$$

□

Proof of Proposition 4

Proof. It is to be proved that $\alpha < \alpha^l$ is a necessary condition for existence of an equilibrium with excess employment when the owners control l. For consistency, I begin with proving existence of equilibrium by providing the following example of a subsidy-for-contribution equilibrium:

Case $\alpha < \alpha^s$:

$$l^* = 0, \qquad s^* = 0,$$
$$l(\bar{s}) = l(0) = 0,$$
$$c_o(0) = 0, \qquad c_o(\bar{s}) = \alpha r\bar{s} - n_o(1 - r(1-\alpha))\bar{s},$$
$$c_u(0,0) = c_u(\bar{l},0) = \max\{0, \alpha r\bar{s} - n_o(1 - r(1-\alpha))\bar{s} - \tfrac{1-r}{h}\bar{s}\}, \qquad c_u^s(0,\bar{s}) = c_u^s(\bar{l},\bar{s}) = 0.$$

Case $\alpha \geq \alpha^s$:

$$l^* = 0, \qquad s^* = \bar{s},$$
$$l(\bar{s}) = l(0) = 0,$$
$$c_o(0) = 0, \qquad c_o(\bar{s}) = \tfrac{1-r}{h}\bar{s} + n_u(1 - r(1-\alpha))\bar{s},$$
$$c_u(0,0) = c_u(\bar{l},0) = n_u(1 - r(1-\alpha))\bar{s}, \qquad c_u^s(0,\bar{s}) = c_u^s(\bar{l},\bar{s}) = 0.$$

An equilibrium with $l = \bar{l}$ requires $s = \bar{s}$. Thus, the owners' conditional offer in any equilibrium must satisfy

$$l(s) = \begin{cases} 0 & \text{if } s = 0 \\ \bar{l} & \text{if } s = \bar{s} \end{cases} \quad \text{and} \quad c_o(s) = \begin{cases} 0 & \text{if } s = 0 \\ \delta & \text{if } s = \bar{s} \end{cases}$$

where $\delta \geq 0$ is some number.

The government triggers $l = 0$ by choosing $s = 0$. Thus, any equilibrium with $l = \bar{l}$ must satisfy,

$$c_u(\bar{l},\bar{s}) + \delta \geq \frac{1-r}{h}\bar{s} + \frac{1-b}{h}\bar{l}.$$

Since this is always binding in equilibrium (if not, either the owners or the union could lower their contributions), the union's equilibrium contribution is:

$$c_u(\bar{l},\bar{s}) = \frac{1-r}{h}\bar{s} + \frac{1-b}{h}\bar{l} - \delta.$$

I am interested in the largest set of equilibria with $l = \bar{l}$. Since $s = \bar{s}$ is a necessary condition for this, there is no loss in assuming that the union pays zero contribution whenever $l = 0$ or $s = 0$. Anything else would increase the government's incentive to choose $s = 0$ and thus trigger $l = 0$.

I proceed to setup necessary and sufficient conditions for existence of an equilibrium with $l = \bar{l}$. If the union or the owners do not contribute at all the outcome will be $s = l = 0$, which yields zero utility to both interest groups. Thus, the union's participation constraint is,

$$\begin{aligned} b\bar{l} - n_u(1-\alpha)\bar{l} - n_u(1-r(1-\alpha))\bar{s} - \frac{1-r}{h}\bar{s} - \frac{1-b}{h}\bar{l} + \delta \quad &\geq \quad 0 \Leftrightarrow \\ \bar{l} \geq \frac{(1-r)(1+hn_u)+hn_u r\alpha}{b(1+h)-1-hn_u(1-\alpha)}\bar{s} - \frac{h\delta}{b(1+h)-1-hn_u(1-\alpha)} &\equiv \underline{k} \qquad (20) \end{aligned}$$

and the owners' participation constraint is,

$$\begin{aligned} (\alpha r - n_o(1-r(1-\alpha))\bar{s} - (\alpha + n_o(1-\alpha))\bar{l} - \delta \quad &\geq \quad 0 \Leftrightarrow \\ \bar{l} \leq \frac{(\alpha r - n_o(1-r(1-\alpha))}{\alpha + n_o(1-\alpha)}\bar{s} - \frac{\delta}{\alpha+n_o(1-\alpha)} &\equiv \overline{k}^{pc} \qquad (21) \end{aligned}$$

The owners can choose to trigger a subsidy-for-contribution equilibrium, where they offer zero excess labor and a sufficiently positive campaign contribution to pursuit the government to provide subsidy. Given this strategy triggers zero contribution from the union, the owners must pay $\frac{1-r}{h}\bar{s}$ to compensate the government. The owners' incentive constraint becomes,

$$\begin{aligned} (\alpha r - n_o(1-r(1-\alpha))\bar{s} - (\alpha+n_o(1-\alpha))\bar{l} - \delta \quad &\geq \quad (\alpha r - n_o(1-r(1-\alpha))\bar{s} - \frac{1-r}{h}\bar{s} \\ \Leftrightarrow \bar{l} \leq \frac{1-r}{h(\alpha+n_o(1-\alpha))}\bar{s} - \frac{\delta}{\alpha+n_o(1-\alpha)} &\equiv \overline{k}^{ic} \qquad (22) \end{aligned}$$

A necessary and sufficient condition for the existence of an equilibrium with $l > 0$ is that there exists $\delta \geq 0$ such that equations (20), (21) and (22) are satisfied. A necessary condition is that there exists a $\delta \geq 0$ s.t. $\overline{k}^{ic} \geq \underline{k}$ or

$$\begin{aligned} &\left[\frac{1-r}{h(\alpha+n_o(1-\alpha))} - \frac{(1-r)(1+hn_u)+hn_u r\alpha}{b(1+h)-1-hn_u(1-\alpha)}\right]\bar{s} \\ \geq \quad &\left[\frac{1}{\alpha+n_o(1-\alpha)} - \frac{h}{b(1+h)-1-hn_u(1-\alpha)}\right]\delta \qquad (23) \end{aligned}$$

Case $\alpha + n_o(1-\alpha) \leq \frac{b-1}{h} + (b - n_u(1-\alpha)$**.** Condition (23) requires

$$\begin{aligned} \frac{1}{h(\alpha + n_o(1-\alpha))} &\geq \frac{(1+hn_u) + hn_u\frac{r}{1-r}\alpha}{b(1+h) - 1 - hn_u(1-\alpha)} \Rightarrow \\ \alpha &< \frac{b(1+h) - (1 + h(n_o + n_u))}{h(1 - n_o - n_u)} \equiv \alpha^l \end{aligned}$$

Case $\alpha + n_o(1-\alpha) < \frac{b-1}{h} + (b - n_u(1-\alpha)$**.** In this case a necessary condition is found from using an upper bound, $\bar{\delta}$, for δ. Equation (22) yields

$$\bar{\delta} \equiv \frac{1-r}{h}\bar{s} - (\alpha + n_o(1-\alpha))\bar{l}.$$

Putting this upper bound into equation (20) yields

$$\begin{aligned} (b(1+h) - 1 - hn_u(1-\alpha))\bar{l} &\geq (hn_u(1 - r(1-\alpha))\bar{s} + h(\alpha + n_o(1-\alpha))\bar{l} \Rightarrow \\ \alpha &< \frac{b(1+h) - (1 + h(n_o + n_u))}{h(1 - n_o - n_u)} \equiv \alpha^l \end{aligned}$$

□

Proof of Proposition 6

Proof. Each of the three requirements in equation (8) was derived in the proof of Proposition 4 in the case where the owners offer zero contribution ($\delta = 0$). It was also shown that in the case where $\alpha + n_o(1-\alpha) \leq b - 1 + h(b - n_u(1-\alpha))$ the existence of a labor for subsidy equilibrium with $\delta = 0$ is a necessary condition for the existence of any labor-for-subsidy equilibrium. □

Proof of Proposition 7

Proof. Let the government control l. From the proofs of Proposition 1 and 2, the complete list of equilibrium resource allocations using additively separable contribution functions is given by,

		EquilibriumR.A.	*Case*
	$\alpha > \alpha^l$	$(l^*, s^*) \in \{(0,0)\}$	(1)
$\alpha < \alpha^s$	$\alpha = \alpha^l$	$(l^*, s^*) \in \{(0,0), (\bar{l}, 0)\}$	(2)
	$\alpha < \alpha^l$	$(l^*, s^*) \in \{(\bar{l}, 0)\}$	(3)
	$\alpha > \alpha^l$	$(l^*, s^*) \in \{(0,0), (0, \bar{s})\}$	(4)
$\alpha = \alpha^s$	$\alpha = \alpha^l$	$(l^*, s^*) \in \{(0,0), (0, \bar{s}), (\bar{l}, 0), (\bar{l}, \bar{s})\}$	(5)
	$\alpha < \alpha^l$	$(l^*, s^*) \in \{(\bar{l}, 0), (\bar{l}, \bar{s})\}$	(6)
	$\alpha > \alpha^l$	$(l^*, s^*) \in \{(0, \bar{s})\}$	(7)
$\alpha > \alpha^s$	$\alpha = \alpha^l$	$(l^*, s^*) \in \{(0, \bar{s}), (\bar{l}, \bar{s})\}$	(8)
	$\alpha < \alpha^l$	$(l^*, s^*) \in \{(\bar{l}, \bar{s})\}$	(9)

To prove Proposition 7 it has to be shown that in each of the 9 cases, any equilibrium resource allocation is still an equilibrium resource allocation allowing for general contribution functions. Since the basic way of proving this is the same in all 9 cases, I will present a detailed proof of Case 1 only.

Case 1:
From the proof of Proposition 1 and 2 the following is true:

$$
\begin{aligned}
&c_o^s(0) = c_u^s(\bar{s}) = c_u^l(0) = c_o^l(\bar{l}) = 0 \\
&c_u^l(\bar{l}) \geq b\bar{l} - n_u(1-\alpha)\bar{l} \\
&c_o^l(0) = -\tfrac{1-b}{h} + c_o^l(\bar{l}) + c_u^l(\bar{l}) \geq -\tfrac{1-b}{h} + b\bar{l} - n_u(1-\alpha)\bar{l} \\
&c_o^s(\bar{s}) \begin{cases} \geq \alpha r\bar{s} - n_o(1-r(1-\alpha))\bar{s} & \text{if } \alpha r\bar{s} - n_o(1-r(1-\alpha))\bar{s} - \tfrac{1-r}{h} \geq 0 \\ \in [0, c_u^s(0) + \tfrac{1-r}{h}] & \text{else.} \end{cases} \\
&c_u^s(0) \geq \max\{0, -\tfrac{1-r}{h} + c_o^s(\bar{s})\} \geq \max\{0, -\tfrac{1-r}{h} + \alpha r\bar{s} - n_o(1-r(1-\alpha))\bar{s}\}
\end{aligned}
$$

The two interest groups equilibrium welfare is:

$$
\begin{aligned}
V_o^*(0,0) &= -c_o^l(0) \geq -\alpha\bar{l} - n_o(1-\alpha)\bar{l}, \\
V_u^*(0,0) &= -c_u^s(0) \geq -n_u(1-r(1-\alpha))\bar{s}.
\end{aligned}
$$

Allow both interest groups to use general contribution strategies. First, I show that the owners cannot gain from triggering a different policy outcome:

- $\underline{(\bar{l},0)}$: The highest utility is in this case obtained by offering zero contribution. This could have been achieved through a additively separable contribution strategy too.

- $\underline{(0,\bar{s})}$: The government's incentive constraint implies,

  $$C_o(0,\bar{s}) \geq \frac{1-r}{h} + c_u^s(0) + c_u^l(\bar{l}) - \frac{1-b}{h} \geq \alpha r\bar{s} - n_o(1-r(1-\alpha))\bar{s} + c_o^l(0)$$

  The change in utility, $\Delta\tilde{V}_o$, is bounded above by

  $$\Delta\tilde{V}_o \leq \alpha r\bar{s} - (1-r(1-\alpha))n_o\bar{s} - c_o(0,\bar{s}) + c_o^l(0) \leq 0$$

- $\underline{(\bar{l},\bar{s})}$: The government's incentive constraint yields,

  $$
  \begin{aligned}
  &c_0(\bar{l},\bar{s}) + c_u^l(\bar{l}) - \tfrac{1-b}{h} - \tfrac{1-r}{h} \geq c_u^s(0) + c_u^l(\bar{l}) - \tfrac{1-b}{h} \\
  \Leftrightarrow\ & c_0(\bar{l},\bar{s}) \geq \tfrac{1-r}{h} + c_u^s(0) \geq \alpha r\bar{s} + (1-r(1-\alpha))n_o\bar{s} \\
  \Rightarrow\ & \Delta\tilde{V}_o \leq -\alpha\bar{l} - n_o(1-\alpha)\bar{l} + \alpha r\bar{s} - (1-r(1-\alpha))n_o\bar{s} - c_0(\bar{l},\bar{s}) + c_o^l(0) \leq 0.
  \end{aligned}
  $$

Second, I show the union cannot benefit from forcing a change in resource allocation:

- $\underline{(0,\bar{s}):}$ The union tries to trigger this through zero contribution. If the government still chooses $(0,0)$ then $c^s(0)=0$. If the government chooses $(0,\bar{s})$ then $\Delta\tilde{V}_u = -n_u(1-r(1-\alpha))\bar{s} + c_u^s(0) \leq 0$.

- $\underline{(\bar{l},0)}$**:**
Case: $-\frac{1-r}{h} + c_o^s(\bar{s}) > 0$: The government's incentive constraint yields,

$$c_u(\bar{l},0) - \frac{1-b}{h} \geq c_o^l(0) + c_o^s(\bar{s}) - \frac{1-r}{h},$$
$$\Rightarrow \Delta\tilde{V}_u = b\bar{l} - n_u(1-\alpha)\bar{l} - c_u(\bar{l},0) + c_u^s(0) \leq 0.$$

Case: $-\frac{1-r}{h} + c_o^s(\bar{s}) \leq 0$: In this case $c_u^s(0) = 0$.

$$c_u(\bar{l},0) - \frac{1-b}{h} \geq c_o^l(0)$$
$$\Rightarrow \Delta\tilde{V}_u = b\bar{l} - n_u(1-\alpha)\bar{l} - c_u(\bar{l},0) \leq 0.$$

- $\underline{(\bar{l},\bar{s}):}$

$$c_u(\bar{l},\bar{s}) + c_o^s(\bar{s}) - \frac{1-b}{h} - \frac{1-r}{h} \geq c_o^s(\bar{s}) - \frac{1-r}{h} + c_o^l(0)$$
$$\Leftrightarrow c_u(\bar{l},\bar{s}) \geq \frac{1-b}{h} + c_o^l(0) \geq b\bar{l} - n_u(1-\alpha)\bar{l}$$
$$\Rightarrow \Delta\tilde{V}_u = b\bar{l} - n_u(1-\alpha)\bar{l} - n_u(1-r(1-\alpha))\bar{s} - c_u(\bar{l},\bar{s}) + c_u^s(0) \leq 0$$

□

Working Paper

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