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Public Ownership as a Signalling Device

We study public ownership from the perspective of political economics. A partly partisan government runs a state-owned firm. The number of employees the government wants to hire depends both on economic conditions and on the preferences of the government, both unknown to the electorate. The government's policy towards the state-owned firm gives a signal of its preferences, and may thereby influence the probability that the government is re-elected. As a result, the governance of the firm becomes inefficient and static, in the sense that it does not react adequately to changing economic conditions.
 JEL-codes: D21, D82, L33

A wind of privatisation has blown over most of the world. In former communist countries in Eastern Europe, entire industries that formerly were state-owned have been sold to the private sector. In Western Europe, politicians and economists alike have advocated private rather than public ownership, and privatisation of large state monopolies for instance in the telecom and energy sector has followed. For other institutions within the public sector, like universities and hospitals, there seems to have been a move towards more independence and less direct control by the government.

This wave of privatisation is mostly based on faith rather than on sound economic theories (Schmidt 1996). From a theoretical perspective, it turns out to be rather difficult to see why the government in principle cannot run a firm as efficiently as private owners, since the government has the option of running the state-owned firm in the same manner as a private firm does. In principle, the government as an owner of a firm can align the managers interests with its own in the same way as in a private firm. By providing the manager with the right incentives and with the authority to design incentive schemes for his or her subordinates, the government may manipulate the behaviour of the firm. If the government's only interest is the revenues the firm creates, the government should provide the manager with the same incentive contract as would private owners, and thereby enjoy the same revenues. On the other hand, if the government for instance due to market

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failures has preferences over other issues than profits, the contract with the manager should reflect this. The state-owned firm may then perform better (from the government's point of view) than the private, profit maximising firm. Note the analogy with the claims in Lange and Taylor (1938) that a socialist economy can always do as well as and may do better than the market economy.

In the literature, several shortcomings in the arguments above have been pointed out, see Laffont and Tirole (1993). Firstly, private firms frequently use equity-based performance measures, like stocks and stock options. A publicly owned firm is not traded and thus does not have a market value. A counter argument to this is that the market value of a state-owned firm may be estimated by a third party like a consultancy firm (or several consultancy firms), and the bonus to the manager could in principle be tied to this estimation. Alternatively, the government may decide to allow a small share of the firm to be publicly traded just to get a market price. Note also that share and option programs to top managers do not seem to play a crucial role in Norway.

Secondly, public ownership excludes bilateral strategic investments and alliances with other firms. The Norwegian state-owned oil company Statoil claims that it wants to trade shares with the French oil company Elf and that this is important for the company. More generally, there exists a market for ownership, and if this market functions well, the resulting ownership structure should be optimal. By deciding up-front that a firm is state-owned, the firm in question is excluded from this market. We will not claim that these issues are not important. However, the economics profession has not yet developed a coherent and operative theory on why ownership matters and even less so on the benefits of cross-ownership.

Finally, the argument that the owners may govern the firm through contracts may be weakened if it is impossible to write complete contracts. In this case, ownership may matter. Schmidt (1996) argues that the owner of a firm has superior information regarding this firm. If the government owns a company, the government cannot constrain itself from using this information when beneficial \emph{ex post}. In a world of incomplete contracts this may be harmful \emph{ex ante} and may reduce the manager's incentives to undertake investments. Although this result is interesting and important, it may be difficult to believe that the drawback of state ownership is that the state as an owner obtains too much information. Hart, Shleifer, and Vishny (1997) focus on ownership as a residual right of control, that is, who has the right to decide in contingencies not covered by the contract. It is argued that with incomplete contracts it may be optimal that the manager owns the company rather than the government. The argument is that this improves the incentives to make cost-reducing innovations. However, when quality of the service produced by the agency is hard to verify, the incentives of private contractors may be *too* strong since they ignore the adverse impact on quality. In some situations, therefore, the low powered incentives of public ownership is desirable in order to maintain quality. In their model, therefore, the proper scope of governmental ownership is based on evaluation of these costs and benefits of low powered incentives, i.e. the importance of innovation verus quality.

Political signalling

In this paper, we develop an alternative reason as to why public ownership may be inefficient. We do not claim that it is impossible for the government to run a firm as efficiently as

private owners can. Our issue is instead whether the government has incentives to do so. More specifically, we argue that a political system with elections does not give the government incentives to run the state-owned firm in an efficient manner. Inefficiently run state-owned firms are thus a result of political failure.

Our main argument is related to political signalling. The idea behind political signalling is that the government has preferences over what kind of policy it wants to implement and that the electorate has imperfect information about these preferences. Thus, the electorate will continuously update their beliefs about the preferences of the government by observing its behaviour. The electorate's beliefs about the preferences of the government may in turn influence their voting behaviour. Politicians know this, and take the signalling effects into account when deciding on policy.

Suppose, for example, that the government changes the wage contract of the top-managers in a state-owned firm, introduces competitive salaries, (potentially) huge bonuses, introduces attractive retirement packages, parachutes, golden coffins etc. This may easily influence the electorate's beliefs about the government's preferences more generally; it will be interpreted as sign that the government is pro-business, cares about the rich and wealthy, and does not care about income distribution. This may happen even if it is rational to give such compensation packages and this is understood by the people.

Similarly, if a government downsizes dramatically or closes down a large public firm, sending thousands on the dole, it may signal that the government finds this acceptable and that the fate of its employees (and employees in general?) is not important. If the government allows a state-owned firm to discharge pollutants, it may signal that the

government does not care about pollution, even if the emissions were legal. If the government allows the firm to export /import in countries with dubious regimes, it may signal that these regimes can be tolerated. The list goes on. A government that cares about re-election will obviously take the signalling effect of its actions into account, as this will influence its chances for re-election. Thus, because political as well as economic considerations influence the way state-owned firms are run, the firms may not be governed effectively from an economic point of view.

Before we continue, note that political signalling is not new within political economics. Cukierman and Tommasi (1998) analyse the incentives of governments representing different political parties in a relatively general setting. In their model, parties have private information about their preferences (and economic fundamentals), and the incumbent party distorts his policy proposal in order to conceal his true type. In Harrington (1993), the voters know the parties' preferences, but they are uncertain about the parties' beliefs about how the economy works. Schultz (1996) analyses how parties may have an incentive to misrepresent the cost of providing public services. In his model, voters know the parties' valuation of a public good, but not the costs of providing the good. Before the election, each party announces policies (the level of the public good). In a pooling equilibrium, the parties' announced policy does not vary with the costs of production. In Swank (1998), an incumbent party signals the cost of providing the public good by its actual policy prior to the election. The key innovation of present paper is that it links political signalling to state ownership. State ownership implies that politicians (or those appointed by politicians) are governing the firm. Hence, decisions made by the firm represent the will of the

politicians. For the first time, we demonstrate how this link may lead to inadequate response by state-owned firms to a changing business environment.

The paper is organised as follows: in the next section we present the model. The equilibrium in this model is discussed in section 5. The paper concludes with a discussion of relevance of the model and the consequences of our findings in section 6.

The model

The economy consists of two sectors. The private sector consists of privately owned firms and the state-owned sector consists of a large state-owned firm. The government may influence employment by different means. In the state-owned sector, the government is by definition the owner of the firm, and, therefore, holds the right to make employment decisions. Before we add political interests to problem, there are two important effects of employment decisions in the state-owned firm. First, the profitability of firm is affected. By choosing an efficient employment level, costs are reduced and profits increases. Since profits are used to finance public goods, this is appreciated by the government (everything else equal). Second, assuming a rigid labour market, a down-sizing decision causes increased unemployment in the state-owned sector. This gives rise to social, as well as economic costs.

The government may also manipulate employment in the private sector by the government. By subsidising training or employment, investing in employment agencies and so on, the government is able to reduce employment. Again the cost of this policy is a lower production of public goods (for a given tax level).

How the government prefers to handle the trade-off between a high employment level and a high level of public spending on other issues depends on the political preferences, i.e. how much weight the government gives to low unemployment relative to high public consumption. This is assumed to be unknown to the voters prior to election. This may be because these preferences change (although slowly) over time.

Furthermore, we also assume that the government is better informed about the costs of a high-employment policy in the state-owned firm. This may depend on factors such as production technology and demand. Following Schmidt (1996), the owner of a firm (i.e., the government) is assumed to have superior information regarding these factors. For simplicity we assume that the two sectors are completely separated, and no workers move between the sectors (however, this is not necessary for our results to go through).

The timing of the game is as follows:
1. The government observes the trade-off between employment and profitability in the state-owned firm.
2. The government chooses employment in the state-owned firm, or equivalently the unemployment level in this sector u^0.
3. The electorate observes u^0, and updates its beliefs about the government's preferences.
4. An election is held.
5. If the government is elected, it implements its preferred policy in the private sector, i.e. chooses u^p.

We assume that the incumbent party's preferences do not change over the election. Thus, the electorate may learn about the incumbent party's preferences by observing its employment policy in the state-owned sector. Still, the observed employment policy is at best a noisy signal of political preferences since the electorate does not know the trade-

off between employment and profit in the state-owned firm.

Technology and preferences of the incumbent party

Let the parameter g reflect the trade-off between employment and profit in the state owned-firm, which is private information to the government. A high value of g means that hiring people is more costly in terms of reduced profit in the state-owned firm. We assume that the preferences of the government depend on a parameter e that is unknown to the electorate. A high value of e reflects that the party gives less weight to low unemployment ("right-wing"), while a low value of e reflects the opposite ("left-wing"). Note that $e=0$ refers to a neutral case in which the government's expected preferences are moderate (neither right-wing nor left-wing). If $e<0$, there is a left-wing bias in the electorate's belief about the incumbent party, whereas $e>0$ capture a right-wing bias in the electorate's belief. Let a denote the state-owned firm's weight in the economy. Finally, let Π denote the intrinsic (stay-in-office motivated) value for the incumbent of winning the election. These parameters are introduced in a reduced-form representation of the incumbent's preferences:[1]

$$W = -a[u^0 - (u^* + e + g)]^2 + p[\Pi - (1-a)(u^p - (u^* + e))^2] \qquad (1)$$

The first term reflects preferences regarding the pre-election policy of the state-owned firm. Everything else being equal, the government would prefer to set $u^0 = u^* + e + g := u$. The second term reflects the preferences over policy conducted after the election. With probability p the government wins the election. If so, it will cash in Π just to stay in office. In addition, the government has preferences over the employment level in the private sector, reflected in the second part of the last term. After the election, the government implements its favoured policy, e, and the last term simplifies to $p\Pi$. Note that the incumbent has no preferences over what policy the opponent will implement if he wins. The assumption simplifies the algebra, and is rationalised by the fact that a party after an electoral defeat often reorganises and change political platform (and thus preferences) anyway.[2]

Voters' preferences

Each voter has a preferred policy u^i showing his preferred unemployment rate in the private sector (his preferences for employment in the state-owned sector is irrelevant as this decision has already been taken when they go to the ballot boxes). We assume that there are only two parties, and since political preferences are one-dimensional and single-peaked, it follows that the median voter theorem holds. We denote the median voter's preferences (that is, his preferred unemployment rate in the private sector) by u^m. In order to avoid too strong results we introduce probabilistic voting, which means that the politicians do not exactly know the preferences of the median voter. We formalise

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1. Our formulation indicates that not only overall unemployment, but also the distribution of unemployment over different submarkets matter. As will be clear later, we assume that the marginal costs of unemployment are increasing, and that (for a given overall unemployment rate) both the government and the electorate prefer the unemployment rate to be the same in the two sectors.
2. Schultz (1995) argues that the incumbent party is likely to care about social welfare mainly when reelected.

this by assuming that the median voter's preferences are drawn from a uniform distribution $[u^* - c, u^* + c]$, where $c > 1$.

The electorate has no information about the opposition's preferences, and thus assumes that it is equal to u^* (see below). If the electorate, after observing u^o, draws the conclusion that the incumbent politician's preferred unemployment rate is u', the incumbent politician is preferred by the median voter if and only if $|u^m - u^*| > |u^m - u'|$, which happens with probability

$$p(u') = \frac{1}{2} \frac{|u'-u^*|}{4c} \qquad (2)$$

Importantly, it follows that the incumbent's probability of winning is maximised if the electorate believes that the government's bliss point (preferred policy) is equal to 0. With no loss of generality, we simplify notation by normalising u^* to zero in the remaining sections. u^*.

Equilibrium policy

Based on this simple set up, it is possible to derive some implications for political owner-ship.

Proposition 1 *The employment decision in the state-owned firm does not respond to changes in the business environment.*

A formal proof based on simplifying assumptions about e and g is offered in the appendix. Here we give the intuition. The state-owned firm becomes static. Although all parties would like the employment in the state-owned firm to vary with the business environment, political competition towards the next election makes them unwilling to respond. The reason is that the voters cannot observe party preferences e and business environment g. If they observe high

unemployment in the state owned sector, the voters cannot observe whether this is because the party in position gives low priority to employment or the business environment makes this a very profitable action. However, the rational voter will find it more likely that the party gives low priority to employment. Since signalling of *extreme* preferences in either directions is costly in terms of reduced election probability, we end up with *passive* political owners. A consequence of static state-owned firms, is that the electorate does not learn (or gets more information) about the preferences of the government. Although this is costly for the government, as it sincerely wants the state-owned firm to react to a changing business environment (as seen in the first part of the objective function), the cost of allowing for a flexible policy rule in terms of a reduced probability of re-election is even bigger.

It is important to note that this result is not driven by an assumption that the government is populistic and only want to stay in office. A purely office-motivated government of this kind has no incentives other than doing whatever the median voter prefers at any time, and as it has no political preferences of its own it has nothing to signal. Our results actually hinge on our assumption that the government is partisan and really wants to push through its preferred policy after the election. This is why it is important for the electorate to know the true preferences of the competing political parties and why signalling is meaningful. This gives us a strong indication that the state-owned firm is inefficiently run. To be more specific, consider all preferences on the same form as in (1), that is, on the form

$$W = - Ed[u^0 - (u^* + e + g)]^2$$

for some value of e, where the expectation is

taken with respect to *g*. We say that a policy rule for the state-owned firm, *A*, is a *political failure* in the state-owned sector if there exists a different policy rule, *B*, which is preferred for all and strictly preferred for some political preferences within this preference class. Furthermore, in this case we also say that policy rule *B* dominates policy rule *A*. Note that if the government can commit to a policy rule, there will be no political signalling, and the probability that the government wins the election is 1/2.

With the simplifying assumption made in the appendix, it is easy to show that there is a political failure. The centrist policy rule dominates the equilibrium policy rule:

Proposition 2 *The equilibrium policy rule is a political failure, as it is dominated by the centrist policy rule which sets* $u^o = u^* + g$

Finally, one may argue that the distortions created in the state-owned firm may be worthwhile if the electorate, because of signalling, learns about the preferences of the government and thereby is able to make better policy choices. However, in our model there is no learning, as the government always choose the same policy. Therefore, signalling has no value in our set-up.

So far we have assumed that the electorate initially believes that the government is centrist. If we change this assumption we may obtain even stronger results. For instance, suppose the electorate becomes more rightist and business friendly. In this case, the leftist parties may have an incentive to go for a right-wing policy towards the state-owned firms to signal their new preferences. However, the desire to signal may lead the leftist government to pursue a right-wing policy of low employment in the state-owned firms even if the business conditions actually call for a more leftist policy. Furthermore, in order to signal

truthfully, the leftist party may actually have to oversell its message by choosing a policy that is to the right of the preferred policy for a right-wing party. In any case, the policy towards the state-owned firm is static and insensitive to the economic environment.

Finally, if the electorate's preferences change over time the government, in an effort to show that they are still in line with the median voter, may govern the state-owned firm in a way that is erratic and inconsistent over time. More generally, one variable cannot optimally serve two purposes, and if the governance of a state-owned firm is used as a signalling device one cannot at the same time expect the decisions made to be consistent with optimal ownership.

In our model, the government owns only one firm. What we refer to as the firm may, of course, be interpreted as an industry (or all state-owned firms) rather than a single firm. In this case, the employment decision concerns aggregate employment. Alternatively, we may still interpret the state-owned firm as one of many state-owned firms, if it is so that the status of the firm will be brought to the electorate's attention only if changes in employment are about to take place. This seemed to be the case with the steel plants in Norway and the coal mines in the U.K. It may also be that only a fraction of the electorate cares about the employment decisions in a local state-owned firm. Signalling through the employment decision may still be worthwhile if the issue is sufficiently important for these voters.

We have chosen to focus on the employment decision as an instrument for signalling. However, as discussed above, the government may also signal through other decision variables related to their governance of the state-owned firm. If the government hands out large bonuses or golden parachutes to the top executives in the state-owned firms, this

may easily be interpreted as a right-wing signal, and the same is true if the government introduces strong elements of performance pay more generally. Our signalling story thus implies that the decision to introduce such measures may be distorted through the same kind of mechanism as described above.

Concluding remarks

Most of the previous literature on public ownership adopt the incomplete-contract paradigm to investigate the why and how public ownership matter. This paper takes another perspectives by focusing on the politicians care about the next election. Politicians wants to convince the voters that the preferences of the party is not in conflict with the voters' preferences. By public ownership, the politicians becomes the owner of the firms. Hence, the observed performance of the state-owned firm will send messages to the voters about political preferences. The main result is that this create inefficiencies.

The obvious remedy to reduce problems related to signalling is to create a distance between the government and the state-owned firm. One may thereby reduce the connection between the government's preferences and the governance of the state-owned firm, thereby reducing the scope for signalling. However, creating a distance between the government and the state-owned firm may easily create problems of its own. Firstly, the reason as to why the firm is state-owned in the first place may well be because it is regarded as important for society that the firm's activities are controlled by the government, for instance if there is a large discrepancy between the private and the social value of the firm's output. Finally, creating a distance between the owners of the firm and the firm may create weak owners and strong managers, which creating its own set of problems.

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Appendix

In this section, we characterise the equilibrium of the model after imposing the following restrictions on the model:

- Preferences: Parties are either left-wing ($e = -1$), centre ($e = 0$) or right-wing ($e = 1$).

- Technology: The technology parameter g is either -1 (employment is "cheap"), $g=0$ (cost of employment intermediate), or $g = -1$ (employment is costly). Each state is equally likely. In addition (and for

technical reasons), with a small probability ε, the value of g is –2, and with the same probability +2.

- Policies: The incumbent party, when deciding on employment in the state-owned firm, has three alternatives to choose from: $u^o = u^*$, $u^o = u^* - 1$ or $u^o = u^* + 1$. This corresponds to the optimal policy for a centrist government when the conditions are normal ($g = 0$), good ($g = -1$) or bad ($g = 1$). We assume that $u = u^* \pm 2$ is not an option. This is to simplify the analysis, but it can also be rationalised by the fact that there may be limits as to how quickly it is possible to change policy (hence the span of possibilities is limited).

- Parameters: We assume that $a < \Pi /12c$. This means that winning the election is important relative to governing the state-owned firm well. At the same time, we assume that $a > \Pi /20c$. Thus, there is a limit on how badly a government (according to its own preferences) is willing to run the state-owned firm.

- Initial beliefs: Initially, the electorate believes that the government is moderate (as for the opponent)[3]

We will now set up the following set of beliefs of the electorate, which will be justified in equilibrium:

1. Suppose the incumbent party chooses high employment in the state-owned firm. Then the electorate updates its beliefs about the preferences of the incumbent party, and believes with certainty that it is leftist ($e = -1$).

2. Symmetrically, if the policy chosen for the state-owned firm is low unemployment, the electorate believes with certainty that the government is rightist ($e = 1$).

3. If the policy chosen is intermediate unemployment, the electorate does not update their beliefs.

Given these beliefs, it is costly for the incumbent government to increase or decrease employment in the state-owned firm. If they do so, the electorate will recognise them as leftist or rightist, and the probability of being elected falls from 1/2 to $1/2 - \frac{1}{4c}$, that is, with $\frac{1}{4c}$ units (from (2). Thus, the cost of choosing a leftist (or a rightist) policy caused by a reduced probability of re-election is $\frac{\Pi}{4c}$ (from equation 1).

Consider first the party at the centre (the centrist party). Suppose that business conditions call for a moderate employment level in the state-owned firms. The intrinsically best policy for the centrist party towards the state-owned firm will then be to go for moderate employment and set $u = u^*$. Furthermore, since this also maximises the probability of re-election, it is surely the preferred policy. Exactly the same is true whenever the party is leftist and the business environment calls for low employment ($e = -1$ and $g = 1$) and when the party is rightist and the business environment calls for high employment ($e = 1$ and $g = -1$).

The problem, however, arises when business conditions call for a different policy.

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3. This may be given two interpretations. Firstly, the government's prior may have almost all the probability mass at $e = 0$. However, for technical reasons $e = -1$ and $e = +1$ must be in the support as well. Secondly, if the electorate's preferences are linear in the unemployment rate, it is sufficient to assume that the prior is symmetrically distributed, as this will ensure that the electorate will vote on the basis of the expected policy only

Suppose $g = -1$, in which case the intrinsically best policy towards the state-owned firm for both the centrist and the leftist party is to set employment high (u low). The gain from this will be a for the centrist and $3a$ for the leftist party (the loss with $u=u^*$ is equal to $4a$, while the loss with $u=u^*-1$ is only a, hence the difference is $3a$). However, by doing so the electorate will draw the conclusion that the government is leftist, and as we have seen this reduces the probability of winning the election. The associated expected cost is (as we have seen) given by $\frac{\Pi}{4c}$. By assumption, $a < \frac{\Pi}{12c}$, and it follows that it is optimal to set $u^o=u^*$ for both the centrist and the leftist argument. For exactly the same reason, the centrist and the rightist party will chose $u^u=u^*$ even if the business environment calls for lower employment.

Finally, by assumption there is an arbitrarily small probability ε that the business conditions are extremely good, that is, that $g = -2$. In this case, the cost of choosing moderate employment for the leftist government is $5a$ (the loss when choosing $u=u^*$ is $9a$, while the loss when choosing $u=u^*-1$ is $4a$, hence the difference is $5a$), and (given our assumptions on parameters) this outweighs the costs $\Pi/4c$. Thus, in this case the leftist party will follow its ideology and go for high employment. The centrist or the right-wing party, however, will not do so. The intrinsic gain for the centrist party of choosing high employment rather than moderate employment ($u = u^* -1$ instead of $u = u^*$) is $3a$, which (as we have seen) is less than the cost associated with a lower probability of re-election. A centrist government will therefore still choose moderate employment. The same certainly holds if the incumbent party is rightist. Finally, by symmetry it follows that if the business environment is extremely bad ($g=2$), only the rightist party will deviate from the moderate employment policy and reduce the employment in the state-owned firm.

In what follows, we focus on the limit equilibrium that arises when $\varepsilon \to 0$. Then the electorate's posterior beliefs are rational. We have thus shown the proposition 1.