Incentives and Workers’ Motivation in the Public Sector∗

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Abstract

Civil servants have a bad reputation of being lazy. However, citizens’ personal experiences with civil servants appear to be significantly better. We develop a model in which people differ in laziness and in public service motivation, and characterise optimal incentive contracts under different informational assumptions. When civil servants’ effort is unverifiable, lazy people find working in the public sector highly attractive and may crowd out workers with a public sector motivation. When effort is verifiable, the government offers separating contracts and optimally attracts motivated workers as well as the economy’s laziest workers. This way, the government is able to extract most of the rents from the motivated workers. Both types’ contracts are distorted in the optimum: lazy (motivated) workers get weaker (stronger) incentives than in the private sector. Even though this reduces aggregate welfare, a majority of society may be better off as both lazy and regular workers gain from lower taxes. Our model also implies that smaller governments are more efficient than larger ones.

JEL codes: H1, J3, J4, L3, M5

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"Citizens and taxpayers have their own global view of bureaucracy. To them, bureaucrats are lethargic, incompetent hacks who spend their days spinning out reels of red tape and reams of paperwork, all the while going to great lengths to avoid doing the job they were hired to do." James Q. Wilson (1989), p. x.

1 Introduction

Bureaucrats have a bad reputation. Jokes about bureaucrats’ laziness and stories on bureaucratic errors abound. The lack of monetary incentives at public organisations is supposed to attract workers who are most averse to exerting effort. This pessimistic view is also prominent in the economics literature. For several decades, the literature has identified bureaucrats as pursuing their narrow self-interest, usually being at odds with the interest of society.1

However, when citizens are asked for their personal experience with public agencies, many tend to be satisfied with the performance of the agency. Customers’ evaluation of a specific agency or civil servant is significantly better than their evaluation of the government or bureaucrats in general (Katz et al., 1975, Goodsell, 1985). Hence, as Wilson (1989) phrases it: "...those lazy, incompetent bureaucrats must work for some other agency..." (p. x).

A new strand in the economics literature emphasises that workers in public organisations (or, more generally, in non-profit organisations) may be intrinsically motivated to work. For instance, Dixit (2002) argues that organisations that have an idealistic or ethical purpose may be attractive to workers who share these goals. Besley and Ghatak (2003) show that a good match between an organisation’s and a worker’s mission may reduce the need for monetary incentives. Francois (2000) and Glazer (2003) develop models where workers intrinsically value the output of the public organisation. In Benabou and Tirole (2003) and Delfgaauw and Dur (2002a, 2002b), by contrast, workers may enjoy exerting effort at work. Empirical research on public service motivation is not fully conclusive (Wright, 2001), but the emerging picture is that civil servants are less motivated by high pay than their private sector counterparts, and have stronger intrinsic motivation (Houston, 2000, Jurkiewicz et al., 1998, Karl and Sutton, 1998).2

How to reconcile these seemingly opposing points of view? This paper

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1See Buchanan (1978), Downs (1967), Niskanen (1971), and Tullock (1965).

2Heckman et al. (1996) also find evidence for intrinsic motivation of public sector workers. They study the introduction of a monetary incentive scheme for training centers under the Job Training Partnership Act. Instead of increasing monetary rewards by picking the best employable candidates for the training, case workers accepted the least employable applicants into the program. The authors argue that case workers’ "...social service mentality..." gives them "...a strong desire to aid the least well off." (p. 2).
develops a model with three types of workers: regular, motivated, and lazy workers. Compared to regular workers, lazy workers prefer to exert little effort in both the private and the public sector. Motivated workers derive utility from working in the public sector, but are otherwise identical to regular workers. We show that it is in the interest of a cost-minimising government to attract, besides motivated workers, lazy workers rather than regular workers.

Whereas the private sector is a competitive market, we model the public sector as a single organisation. This organisation, which we refer to as the public firm, offers one or more contracts specifying the wage and, if verifiable, required effort. The public firm can not observe the workers’ type, and, hence, can not make the contracts contingent on worker type. Workers apply for the contract that yields them the highest utility, provided that the private sector is not a better option.

We consider two cases: verifiable and unverifiable effort. When effort is unverifiable, the public firm prefers to attract either motivated or lazy workers. It may occur that the public firm prefers to attract only motivated workers, but that it can not avoid hiring lazy workers. However, if desired public production is sufficiently large, the public firm wants to attract both motivated and lazy workers, thereby making the problem of nonexcludability of lazy workers less severe.

When effort is verifiable and desired production in the public sector is sufficiently small, the public firm attracts only motivated workers, and extracts all motivational rents from these workers. This full rent extraction may not be possible if a second worker type is needed. Any rents motivated workers obtain when they would choose the other type’s contract can not be extracted by the public firm. Because the outside option of lazy workers is inferior to the outside option of regular workers, their contract is less appealing to the motivated workers. Therefore, the public firm can extract more motivational rents if it attracts lazy workers rather than regular workers.

The public firm distorts both contracts in order to extract even more motivational rents. Lazy workers are provided with lower-powered incentives than private firms offer. This way, the lazy worker’s contract becomes even less appealing to the motivated workers. However, to keep production at the desired level, this implies that the public firm has to hire additional lazy workers, which is costly. These costs can be reduced by giving motivated workers higher-powered incentives, above the level private firms would offer.

Our model is related to the literature on screening of workers’ ability.\(^3\) In a standard adverse selection model (see e.g. Laffont and Martimort, 2002), a firm induces the ‘low’ type to exert a suboptimally low level of effort, so as to extract more of the rents from the ‘high’ type. The contract of the

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\(^3\)There is a large literature on screening following the seminal papers by Spence (1973) and Rothschild and Stiglitz (1976). For an overview, see Riley (2001).
‘high’ type is efficient. In contrast, in our model the contracts of both types are distorted. Whereas in the standard model a firm designs contracts for a fixed number of workers, our model describes the behaviour of a firm which has to attract workers to meet a production requirement.\footnote{It is easy to extend our model to allow for price-elastic demand for the public good. Then, as in the case of a production requirement, both contracts are distorted.}

Heterogeneity in laziness may stem from heterogeneity in general work ethic or morale, but may also stem from differences in people’s physical fitness. Differences in work ethic have been associated with, for instance, personality traits (Furnham, 1992) and cultural factors (Hofstede, 1991). Companies deem these differences important, as can be seen from the widespread use of personality tests to select from the pool of job applicants (see Jenkins (2001) for the UK and Ryan et al. (1999) for an international comparison of selection methods). Theoretical work by Stowe (2002) shows that higher morale implies higher effort of the worker, but does not necessarily translate into a higher wage when the firm has monopsony power. In this paper, we assume that the public firm has monopsony power over workers with a public sector motivation, whereas general work morale does not give rise to monopsony power, neither to the public firm nor to private firms.\footnote{This paper builds on previous work (Delfgaauw and Dur, 2002a and 2002b). In Delfgaauw and Dur (2002a), we examine the implications of workers’ intrinsic motivation for optimal monetary incentive schemes. Furthermore, we show that a monopsonist needs to commit to a minimum wage in order to attract any applicant from a population of workers that is heterogeneous in intrinsic motivation. In Delfgaauw and Dur (2002b), we analyse the consequences of liberalisation of a sector previously dominated by a public firm, when workers differ in their intrinsic motivation to work in the sector. In line with empirical findings, we show that liberalisation leads to stronger incentives, higher productivity and lower employment, but also to higher wage cost.}

Most related to our work is a recent paper by Prendergast (2004). When workers differ in altruism for clients, the government prefers to attract different worker types for different agencies. For agencies where the preferences of the government and clients are aligned, as in health care, the government prefers more altruistic bureaucrats, as they advocate most for the clients. However, when the preferences of the government and clients are not aligned, as with (suspected) criminals, bureaucrats should be biased against their clients. Prendergast shows that agencies are likely to attract both the most preferred and the least preferred workers. The latter enter the agency because they benefit most from diverting the government’s most preferred policy.

Our work also relates to Lazear (1986). He argues that firms can use their wage policy so as to attract certain types of workers, as the public firm does in our model. Strong monetary incentives induce highly productive workers to apply at a firm, whereas less productive workers prefer a high base salary and weak incentives (see also Lazear, 1995, and Prendergast, 1999, for surveys). Moen and Rosen (2001) have recently built on this and
argue that, when there is a multi-tasking problem, competition between firms for highly productive workers may result in too high-powered incentive schemes from a social welfare perspective. Burgess and Metcalfe (1999) show empirically that private companies make far more use of incentive wages than public organisations. Moreover, they argue that there are insufficient grounds to justify the low incentivation of the public sector. Our model suggests that lazy workers get indeed weaker monetary incentives at the public firm compared to the private sector. On the other hand, motivated workers get stronger incentives.

These contract distortions are cost-efficient, but reduce social welfare. If we impose that the public firm should maximise social welfare rather than minimise cost, it does not distort the contracts of the workers. Still, the public firm prefers to attract motivated workers, but if a second worker type is needed, it is indifferent between lazy and regular workers. Compared to a cost-minimising public firm, social welfare is higher. However, total cost of public production and, hence, taxes are also higher when the public firm maximises social welfare. Only motivated workers benefit, whereas the utility of lazy and regular workers decreases as a result of higher taxes. When motivated workers are a minority in the economy, politicians are likely to strive for cost-minimisation rather than maximum social welfare, so as to please the public at large.

A few papers consider heterogeneity in laziness among government workers in the context of downsizing the government (Jeon and Laffont, 1999, and Rama, 1999). Jeon and Laffont (1999) show that the optimal voluntary downsizing mechanism consist of a menu of public wages, severance pay and probabilities of dismissal. The government’s choice which workers to retain closely resembles our results in Section 5, where we impose that the government maximises social welfare. They show that when workers differ in a sector-specific trait, the government prefers the workers that have a comparative advantage in the public sector, whereas when workers differ in a general trait, the government is indifferent. Our paper differs in three important aspects. First, we simultaneously consider heterogeneity in general and sector-specific productivity, whereas in their model, workers differ in either general or sector-specific productivity. The presence of motivated workers in our model makes that the cost-minimising government is not indifferent between lazy and regular workers. Second, in their model, effort is fixed, implying that they do not consider optimal incentive schemes. Third, most of our analysis focusses on a cost-minimising government, which distorts the contracts of its workers in order to reduce cost.

Our model implies that small governments are more efficient than large governments, as they need relatively few lazy workers. As an illustration, we relate in Figure 1 for several European countries the share of civil servants
in total employment to citizens’ trust in the civil service.\textsuperscript{6}

![Graph showing trust in civil service vs share of civil servants in total employment.

Figure 1: Citizens’ trust in and the relative share of the civil workforce]

Clearly, there exists a negative relation between the size of the civil workforce and citizens’ attitude towards bureaucrats.\textsuperscript{7} Our model suggests that citizens in countries with a large civil service encounter lazy bureaucrats more often, leading to less trust in civil servants. Furthermore, a recent study by Afonso, Schuknecht, and Tanzi (2003) provides some support for declining marginal productivity of public expenditure. They construct seven indicators of public sector performance and public sector efficiency for 2000 and show that countries with relatively small governments (budget smaller than 40% of GDP) have higher scores for public sector efficiency.\textsuperscript{8}

The paper is organised as follows. The next section describes the model. Section 3 analyses a benchmark case where worker type is observable. In Section 4, worker type is unobservable. There, the public sector minimises cost of production, whereas in Section 5 the public sector maximises social welfare. Section 6 concludes.

\textsuperscript{6}Data on citizens’ trust are from the Eurobarometer 54, 2000, taken from Van de Walle and Kampen (2003, Table 2). Employment data are taken from ILO Yearbook of Labour Statistics 2003. We used ISIC 3 category L for the number of civil servants. Unfortunately, this category contains both public administration and defense personnel.

\textsuperscript{7}Data from the European Values Survey on confidence of citizens in the civil service and from the European Social Survey on trust in government give similar results.

\textsuperscript{8}La Porta et al. (1999) find a negative, but insignificant, correlation between bureaucratic delays and the share of public employment using a dataset which includes non-OECD countries as well.
2 The Model

There are two sectors in the economy, a private and a public sector. The private sector is a fully competitive market. The public sector is run by a single entity, which can be thought of as the government. This single organisation will be referred to as the public firm. Both sectors have the same linear production function:

\[ q(e) = e \]  

where \( q \) is the production in a sector and \( e \) is effort. Each unit of production of the private sector can be sold on the world market for the exogenously determined price \( p \). The public firm produces output such as legislation, regulation, non-rival public goods, etc., which is therefore not priced. The desired amount of public production is given by \( Q \).\(^9\) First, we assume that the public firm minimises cost of production. Afterwards, we compare the results with a welfare-maximising public firm.

Three types of workers exist in the economy: regular workers \( r \), motivated workers \( m \), and lazy workers \( l \). The number of workers of each type in the economy is given by \( N_i, i \in \{r, m, l\} \). Lazy workers incur a greater disutility from working than the other worker types. Motivated workers derive intrinsic utility from exerting effort in the public sector.\(^{10}\)

The utility of a worker of type \( i \) from working in the private sector is given by:

\[ U_i = w - \theta_i C(e) \]  

where \( w \) is the wage, \( C(e) \) describes the cost of effort, with properties \( C(0) = 0, C'(\cdot) > 0, \) and \( C''(\cdot) > 0, \) and \( \theta_i \) measures the degree of laziness. We assume that \( 0 < \theta_r = \theta_m < \theta_l \).

The utility of a worker of type \( i \) from working in the public sector is given by:

\[ U_i = w + \gamma_i V(e) - \theta_i C(e) \]  

where \( V(e) \) is a concave function with properties \( V(0) = 0, V'(\cdot) > 0 \) and \( V''(\cdot) < 0, \) and \( \gamma_i \) measures the public service motivation of a worker. We assume that \( \gamma_m > \gamma_r = \gamma_l = 0. \) Hence, only motivated workers derive utility from exerting effort in the public sector. As motivated workers derive motivational utility only at the public firm, the firm has monopsony power over these workers.\(^{11}\)

\(^{9}\)Price-elastic demand for public goods would not alter any of the results qualitatively. By varying the level of \( Q \), our analysis yields the supply function for public goods. Together, demand and supply then determine the optimal level of \( Q \).

\(^{10}\)Allowing for worker types with private sector motivation does not change the results, as these workers would not seek employment in the public sector.

\(^{11}\)Allowing for a fourth type of worker, who derives motivational utility from working in the public sector, but is lazy as well (\( \gamma = \gamma_m, \theta = \theta_l \)) does not affect the results, unless there are much more lazy motivated workers than regular motivated workers and \( \gamma_m \) is very low compared to \( \theta_l - \theta_r \).
Competition in the private sector ensures that workers in the private sector receive their full marginal product. Hence, total wage of a worker of type \( i \) is given by \( p e_i \). It follows from (1) and (2) that the optimal level of effort \( e^*_i \) of a worker of type \( i \) in the private sector is implicitly given by:

\[
C'(e^*_i) = \frac{p}{\theta_i}
\]  

(4)

The resulting level of utility is:

\[
U^*_i = p e^*_i - \theta_i C(e^*_i)
\]  

(5)

Note that \( U^*_i \) is decreasing in \( \theta_i \).

For future reference, we derive the level of effort motivated workers would exert in the private sector if they would have intrinsic motivation to work in the private sector. This level of effort, denoted by \( e^x_m \), is implicitly given by:

\[
C'(e^x_m) = \frac{p + \gamma_m V'(e^x_m)}{\theta_m}
\]  

(6)

In the public sector, we distinguish two cases, verifiable effort and unverifiable effort. If effort is verifiable, the public firm offers one or more contracts in which both the level of effort and the wage are specified. In the second case, effort (and output) is unverifiable above a certain level of \( e, \bar{e} \). We assume that \( \bar{e} \) is sufficiently small such that it is a binding restriction for lazy and regular workers. This requires that \( \bar{e} < e^*_l \). Then, the public firm can only offer a contract in which a wage level is specified, along with the threat not to pay the wage if effort is below \( \bar{e} \).

Wages in the public sector are financed through a lump-sum (non-distortionary) tax, uniformly levied on all workers in the economy. This implies that we can ignore taxation when deriving the optimal occupational and effort choice of the workers.

3 Benchmark: Observable Types

Suppose that the public firm can distinguish between the different types. Then workers are unable to opt for a contract designed for another type, and the firm can tailor the contract to each worker type.

3.1 Unverifiable Effort

When effort levels above \( \bar{e} \) are unverifiable, lazy and regular workers optimally choose to exert exactly effort level \( \bar{e} \). Motivated workers may decide to

\[\text{\footnote{\(e\) reflects that workers who do not show up at work or remain idle behind their desk all day can be detected and are fired.}}\]
exert more effort than $\bar{e}$, which occurs when the level of effort $e_m$ implicitly defined by first-order condition

$$C'(e_m) = \frac{\gamma_m V'(e_m)}{\theta_m}$$

is greater than $\bar{e}$.

For lazy and regular workers, an attractive feature of working at the public firm is that they have to put in little effort. The opportunity cost for regular workers is higher than for lazy workers, as their utility in the private sector is higher. The same holds for motivated workers. For them, their intrinsic motivation makes working at the public firm attractive.

Total cost of the public firm $Z$ when hiring $n_i \leq N_i$ workers of type $i$ is given by:

$$Z = w_i n_i$$

The minimum wage $w_i$ at which the firm can attract workers of type $i$ is given by the participation constraint: \footnote{We assume that workers are employed either in the private or in the public sector. Allowing for part-time jobs in the private sector increases the contract distortions when worker types are unobservable. We also abstract from subcontracting, thereby ruling out the option that e.g. a motivated worker takes over the contracts of two lazy workers at the public firm.}

$$w_i = U_i^* + \theta_i C(e_i) - \gamma_i V(e_i)$$

The number of workers of a particular type needed to meet the production constraint is given by $n_i = Q/e_i$. It follows that the public firm prefers lazy workers over regular workers, as they demand a lower wage for the same level of effort. \footnote{In the appendix we prove that $\frac{\partial w_i}{\partial \theta_i} < 0$ for lazy and regular workers. Since $\theta_l > \theta_r$, this implies that lazy workers are attracted at a lower wage than regular workers.} The same holds for motivated workers: they require a lower wage, as they derive motivational utility. Moreover, motivated workers may exert more effort than regular workers. Note that when the optimal level of effort of motivated workers $e_m$ is greater than $\bar{e}$, it holds that $\theta_m C(e_m) - \gamma_m V(e_m) < \theta_m C(\bar{e}) - \gamma_m V(\bar{e})$. Hence, the higher the optimal level of effort of motivated workers, the lower the wage needs to be to attract them. Whether the public firm prefers motivated or lazy workers is unclear. Motivated workers exert more effort and need less monetary compensation for their effort, but have higher opportunity cost than lazy workers. However, if $Q$ is sufficiently large such that the public firm needs to hire two worker types, it hires both lazy and motivated workers. \footnote{In the last part of the appendix we prove that for each case considered in the main text, there exists a level of $Q$ for which it is optimal for the public firm to attract two worker types instead of one.}
3.2 Verifiable Effort

When effort is verifiable, the public firm can induce the workers to exert a certain level of effort, and compensate them such that their participation constraint (8) is just met. Consider first the case where $Q$ is sufficiently small, such that the firm needs only one worker type. Given the type of worker, the optimal contract then minimises (7) with respect to $e_i$, subject to the participation constraint (8) and the production constraint $Q = e_in_i$.

This gives first-order condition:

$$
[\theta_i C'(e_i) - \gamma_i V'(e_i)] - \left[ \frac{U^*_i + \theta_i C(e_i) - \gamma_i V(e_i)}{e_i} \right] = 0
$$

In the optimum, the marginal cost of effort by the employed workers (the first term) is equal to the marginal cost of effort by hiring an additional worker (the second term). Using (4) and (5), it is easy to verify that this expression is zero for lazy workers if $e_i = e^*_l$ and for regular workers if $e_i = e^*_r$, where $e^*_i$ denotes the optimal level of effort of a worker of type $i$ in the private sector. Hence, if the public firm chooses to hire lazy or regular workers, it makes them exert as much effort as they do in the private sector.

By (8), this implies that the public firm has to pay them the same wage as they earn in the private sector. When we substitute $e_m = e^*_m$ into equation (9) for $i = m$, we find, again using (4) and (5):

$$
-e^*_m \gamma_m V'(e^*_m) + \gamma_m V(e^*_m) > 0
$$

where the inequality follows from the concavity of $V(e)$. Hence, motivated workers are induced to exert less effort than in the private sector, even though their intrinsic motivation makes them willing to exert more effort at the same wage than in the private sector. Because the marginal rents from motivation of a single worker decrease in $e_m$, it is optimal for the public firm to set $e_m$ relatively low and attract additional motivated workers. Thereby, the public firm increases the total rents of motivation that can be extracted from the motivated workers.\(^{16}\)

Comparing the optimal contracts of the different workers types, it follows that the public firm prefers to hire motivated workers. It has to pay lazy and regular workers as much for their effort as the private sector, which implies that total cost would be $pQ$. Even if the public firm would let motivated workers work as hard as they do in the private sector, total cost would be lower than $pQ$, namely $pQ - n_m \gamma_m V(e^*_m)$, as the firm can fully extract the rents of motivation. Since the firm optimally decides to set $e_m < e^*_m$, it follows that total cost are even lower.

If $Q$ is sufficiently high, such that the public firm needs workers of a second type, it is indifferent between lazy and regular workers, as it has to

\(^{16}\)It is easy to verify that if $V(e)$ would be a linear function, the public firm would optimally set $e_m = e^*_m$. 

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pay $p$ for each unit of effort of both types.\footnote{We will see in the next section that this result depends on our assumption that types are observable.} In the appendix, we derive that, in this case, $e_m = e_m^x$ and that the total cost of the public firm are given by:

$$Z = pQ - N_m \gamma_m V(e_m^x)$$

where $e_m^x$ is the level of effort motivated workers would exert in the private sector if they would have intrinsic motivation to work in the private sector, as defined by (6). The public firm optimally designs the contracts such that it pays $p$ per unit of effort and extracts all of the rents from motivation from the motivated workers.

4 Unobservable Types

Now consider the case where the public firm can not distinguish between the worker types. When effort is verifiable, the public firm can separate the types by clever design of contracts. However, when effort is not verifiable, separating contracts are not feasible.

4.1 Unverifiable Effort

The effort choice of the workers, the wage needed to attract workers of a particular type, and the preference relation of the public firm over the worker types are the same as in Section 3.1. Hence, regular workers are least attractive, and lazy and motivated workers may both be the best option. However, as the firm is unable to distinguish types, it is possible that the firm prefers to attract motivated workers, but that at the wage it has to offer to attract motivated workers, lazy workers apply as well. This occurs when $w_l < w_m$ and $w_l/\bar{e} > w_m/e_m$, where $w_i$ is defined by (8).

If $Q$ is sufficiently large, the firm needs to attract more than one worker type. Since both lazy and motivated workers can be hired for a lower wage than regular workers, while they exert at least as much effort as regular workers, the firm prefers to hire no regular workers. Hence, it offers a wage which is just sufficient to attract both lazy and motivated workers. Regular workers then prefer to work in the private sector.

As the public firm can not distinguish between lazy and motivated workers, it may not be able to hire all of the motivated workers in the economy. If $\bar{e}$ is non-binding for motivated workers, this implies that total output may be different from $Q$. If $\bar{e}$ is binding for motivated workers, the output requirement is always met. Costs of production are always higher than when types are observable, as the firm can no longer offer different wages to lazy and motivated workers.
4.2 Verifiable Effort

When effort is verifiable, the public firm can offer several contracts, so as to separate the different worker types, and collect more of the rents from motivation.

Consider first the case where $Q$ is sufficiently small, such that the public firm needs only one worker type. It is easy to verify that the results are identical to those of Section 3.2. The public firm thus only hires motivated workers. As the optimal contract derived in Section 3.2 is only acceptable to motivated workers, the public firm can effectively separate the motivated workers from the other workers in the economy. This implies that the public firm is able to attract only the motivated workers, to induce them to exert the optimal level of effort, and extract all of the motivational rents.

Next, consider the case where $Q$ is sufficiently large, such that two worker types are needed. In contrast to the benchmark case, the public firm now has to meet a revelation constraint. Obviously, the firm prefers to hire motivated rather than regular workers, as motivated workers are willing to exert the same level of effort for a lower wage than regular workers. Total cost $Z$ is given by:

$$Z = w_m n_m + w_k n_k$$

and the production constraint is given by:

$$e_m n_m + e_k n_k = Q$$

where $k \in \{r, l\}$. To attract and separate the two types, the firm has to create two contracts that meet the following conditions. First, the contracts must meet the participation constraint of both types:

$$IR_k \quad w_k - \theta_k C(e_k) \geq U_k^*$$

$$IR_m \quad w_m + \gamma_m V(e_m) - \theta_m C(e_m) \geq U_m^*$$

Second, each type must prefer the contract specified for his type over the other contract:

$$IC_k \quad w_k - \theta_k C(e_k) \geq w_m - \theta_k C(e_m)$$

$$IC_m \quad w_m + \gamma_m V(e_m) - \theta_m C(e_m) \geq w_k + \gamma_m V(e_k) - \theta_m C(e_k)$$

Consider first the case where the public firm decides to attract motivated and regular workers, $k = r$. This is a standard adverse selection problem, since $\theta_r = \theta_m$. A well-known result is that the participation (or Individual Rationality) constraint of the ‘low’ type and the revelation (or Incentive Compatibility) constraint of the ‘high’ type are binding, while the other two constraints are non-binding (see e.g. Laffont and Martimort, 2002, chapter 2). Clearly, the public firm hires all motivated workers, and additional
regular workers until the production constraint is satisfied.\(^{18}\) Hence, the optimisation problem of the public firm is to minimise cost (11) with respect to \(e_m\) and \(e_r\), subject to \(IR_r\), \(IC_m\), and the production constraint (12) with \(n_m = N_m\). This gives the following two first-order conditions:

\[
-\frac{N_m}{e_r} [U_r + \theta_r C(e_r)] + N_m \left[ \theta_m C'(e_m) - \gamma_m V'(e_m) \right] = 0 \tag{13}
\]

\[
[e_r \theta_r C'(e_r) - U_r^* - \theta_r C(e_r)] \left[ \frac{Q - e_m N_m}{e_r^2} \right] + N_m \left[ \gamma_m V'(e_r) + C'(e_r)(\theta_r - \theta_m) \right] = 0 \tag{14}
\]

By substituting \(e_r = e_r^*\) into first-order condition (14) and using (4) and (5), the first term drops out. Since the second term is positive, it follows that the public firm induces the regular workers to exert less effort than they do in the private sector, \(e_r < e_r^*\). Substituting this result into equation (13), we find that the contract for the motivated workers is also distorted. The public firm not only induces the motivated worker to exert more effort than in the private sector, \(e_m > e_m^*\), the motivated workers are even induced to exert a higher level of effort than they would in the private sector if they would be motivated to work in the private sector. Hence, \(e_m > e_m^*\).

Intuitively, as in the standard adverse selection model, the public firm makes the contract of the regular workers less attractive to motivated workers by decreasing the level of effort in that contract. Thereby, it can extract a greater part of the rents of motivation from the motivated workers. However, this decrease in effort implies that the public firm needs more regular workers to meet the production constraint, which is costly. It can decrease these costs by increasing the effort of motivated workers. In the optimum, the cost of an additional unit of effort by the motivated workers is equal to the cost of an additional unit of effort by the regular workers.\(^{19}\)

Next, consider the case where the public firm decides to attract motivated and lazy workers, \(k = l\). If the revelation constraint for motivated

\(^{18}\)We have implicitly assumed that the public firm lets applying workers decide which contract to sign. Thereby, we resolve two issues. First, if a worker had to choose for which contract to apply, motivated workers would have to take into account that not all workers applying for the contract designed for the other type get a job. This would weaken \(IC_m\), reducing the rents that the motivated worker obtains. Second, even though the firm can not distinguish types, it can hire all motivated workers, as it is able to observe the choice of contract by the workers after being hired. Thus, the public firm can withdraw the contract for non-motivated workers after \(n_k\) workers have have chosen this contract. Crucial is that the firm has to commit not to change the contract for motivated workers after \(n_k\) non-motivated workers are hired. Furthermore, we also assume that the public firm can commit not to renegotiate the contracts after the types have been revealed, such that the ratchet effect has no bite.

\(^{19}\)It is easy to see that allowing for part-time jobs in the private sector increases the contract distortions. Lazy workers would exert some effort in the private sector, thereby increasing their utility. This reduces the cost of the downward distortion for the public firm, implying that the firm can extract more rents from the motivated workers.
workers $IC_m$ is binding, the optimisation problem of the public firm is similar to that above, leading to first-order conditions (13) and (14) with $r = l$. Hence, the public firm distorts both contracts by giving lazy workers weaker incentives than private firms do, and motivated workers stronger incentives than private firms would.

Interestingly, however, when the public firm attracts lazy workers, it is also possible that the revelation constraint does not bind, i.e. that the contract for lazy workers is less appealing to motivated workers than working in the private sector. In this case, $IR_m$ and $IR_l$ are binding, while $IC_m$ and $IC_l$ are non-binding. As before, the public firm employs all motivated workers, as only this worker type may be willing to work for less than $p$ per unit of effort. Thus, the optimisation problem of the public firm is to minimise cost (11) with respect to $e_m$ and $e_l$, subject to $IR_l$, $IR_m$, and the production constraint (12) with $n_m = N_m$. This gives the following two first-order conditions:

\[ -\frac{N_m}{e_l} \left[ U_l^* + \theta_l C(e_l) \right] + N_m \left[ \theta_m C'(e_m) - \gamma_m V'(e_m) \right] = 0 \quad (15) \]

\[ \left[ e_l \theta_l C''(e_l) - U_l^* - \theta_l C(e_l) \right] \left[ \frac{Q - e_m N_m}{e_l^2} \right] = 0 \quad (16) \]

By substituting $e_l = e_l^*$ and using (4) and (5), we find that the first term between brackets of first-order condition (16) is zero. Hence, the public firm sets the level of effort for the lazy workers equal to their optimal level of effort in the private sector. Obviously, their wage must also be at the same level as in the private sector. Substituting this result into first-order condition (15) gives equation (6), which implicitly defines the level of effort motivated workers would exert in the private sector if they would derive utility from working in the private sector. Hence, $e_m = e_m^* > e_m^x$. The contract offered to motivated workers thus extracts all rents of motivation (as $IR_m$ is binding) and induces them to exert a level of effort that is equivalent to their effort in the private sector, adjusted for their motivation.

The final step is to show whether the public firm prefers to attract lazy or regular workers. First, consider the case where the participation constraint of motivated workers $IR_m$ is binding if the firm attracts lazy workers. Using the results $e_l = e_l^*$ and $e_m = e_m^x$, it is straightforward to show that total cost are given by (10), the total cost of the public firm in the benchmark case. Hence, if the public firm attracts lazy workers, total cost can be as low as in the case of observable types. When, instead, the public firm attracts regular workers, it distorts the contracts of the regular and the motivated workers, and can not extract all of the rents from motivation. Hence, total cost are lower if the public firm attracts lazy rather than regular workers.

Next, consider the case where the revelation constraint of motivated workers $IC_m$ is binding if the public firm attracts lazy workers. In the
appendix, we prove that total cost $Z$ decrease in the general work ethic of the non-motivated worker type $\theta_k$:

$$\frac{\partial Z}{\partial \theta_k} < 0$$

Hence, besides motivated workers, the public firm prefers to attract the economy’s laziest workers. The intuition is as follows. The extraction of motivational rents from motivated workers by the public firm is hampered by the revelation constraint for motivated workers $IC_m$. This implies that motivated workers obtain the rents from motivation they would get by choosing the other type’s contract. Since lazy workers have a worse outside option and exert less effort than regular workers, the public firm maximises rent extraction by attracting lazy instead of regular workers.\(^{20}\)

It follows that the public firm reduces cost by attracting lazy rather than regular workers. Moreover, the public firm may deliberately induce the lazy workers to exert less effort than their counterparts in the private sector. Hence, the laziness of bureaucrats may be a sign of cost-efficient government!

5 Social Planner

In this section, we impose that the public firm maximises social welfare, which we define as the sum of the utility of all workers in the economy. We maintain the assumption that the public firm is unable to observe the types of the workers.\(^{21}\) The utility functions, as specified before, ignored tax cost. The total amount of taxes is simply the sum of the wages of the public sector workers $Z$, which is financed through a lump-sum (non-distortionary) tax, uniformly levied on all workers in the economy. Hence, social welfare is given by:\(^{22}\)

$$\Psi = \sum_i \left( (N_i - n_i)U^*_i + n_iU_i \right) - Z \quad (17)$$

Recall that $n_i$ denotes the number of workers of type $i \in \{r, m, l\}$ hired by the public firm. By using (3), the above expression can be rewritten to:

$$\Psi = \sum_i \left\{ (N_i - n_i)U^*_i + n_i \left[ -\theta_i C(e_i) + \gamma_i V(e_i) \right] \right\} \quad (18)$$

\(^{20}\)Without motivated workers, $N_m = 0$, it follows from first-order condition (14) that the government does not distort the contract of regular or lazy workers. Then, the government is indifferent between lazy and regular workers, as both are willing to work in the public sector for $p$ per unit of effort. Hence, the contract distortions and the preference for lazy workers stem from the presence of motivated workers.

\(^{21}\)If the public firm can observe the types of the workers, the results are the same, except for the minimum compensation which is given by (8).

\(^{22}\)The utility derived from the public firm’s output $Q$ is fixed and, hence, has no influence on the optimisation problem.
Hence, the public firm maximises total utility in the private sector minus the net cost of effort in the public sector.

In the appendix, we prove that the optimal choice of the social planner is identical to that of a cost-minimising public firm when effort is unverifiable, and when effort is verifiable and $Q$ is sufficiently small. Thus, when effort is unverifiable, regular workers are least attractive to the public firm, and lazy and motivated workers may both be the first choice. When effort is verifiable and $Q$ is sufficiently small, the public firm attracts motivated workers, and induces them to exert a level of effort smaller than private firms do, $e_m < e^*_m$.

5.1 Verifiable Effort, Large $Q$

Suppose that $Q$ is sufficiently high, such that it is optimal for the public firm to hire two types of workers. Obviously, the public firm prefers motivated workers over regular and lazy workers, as they derive utility from working at the public firm. Total welfare (18) can be rewritten as:

$$
\Psi = \sum_i (N_i U^*_i) - n_k [U^*_k + \theta_k C(e_k)] - N_m [U^*_m + \theta_m C(e_m) - \gamma_m V(e_m)]
$$

where subscript $k \in \{r,l\}$ denotes the non-motivated worker type the firm hires. Maximising (19) with respect to $e_m$ and $e_k$, subject to production constraint (12) with $n_m = N_m$, gives the following two first-order conditions:

$$
\frac{N_m}{e_k} [U^*_k + \theta_k C(e_k)] - N_m [\theta_m C'(e_m) - \gamma_m V'(e_m)] = 0 \tag{20}
$$

$$
\frac{Q - N_m e_m}{e^2_k} [U^*_k + \theta_k C(e_k) - \theta_k e_k C'(e_k)] = 0 \tag{21}
$$

Using (4) and (5), it follows that first-order condition (21) is zero for $e_k = e^*_k$. Hence, the non-motivated worker type is induced to exert the same level of effort as in the private sector. This implies that the public firm is indifferent between hiring lazy or regular workers, as both types derive the same utility in the private and the public sector. Substituting this result into first-order condition (20), it follows that the effort of motivated workers is (implicitly) given by (6), the level of effort motivated workers would exert in the private sector if they would derive utility from working there, $e_m = e^x_m$. Hence, a social planner does not distort the contracts of its employees. Wages are set such that the participation constraints $IR_k$ and $IR_l$ and the revelation constraints $IC_k$ and $IC_m$ are all satisfied.23

23 Because utility is linear in income, the distribution of income does not affect social welfare. When the social welfare function is extended to allow for distributional concerns, the public firm may distort contracts, as in Boyer and Laﬀont (2003). Then, rent extraction from motivated workers may be considered optimal for distributive reasons.
The social welfare maximising contracts differ from those offered by the cost-minimising public firm. This implies that, compared to a cost-minimising public firm, social welfare is higher, but also total cost and, hence, taxes are higher when the public firm maximises social welfare. Apart from taxes, lazy and regular workers derive equal utility in both cases. Hence, a social planner reduces the utility of lazy and regular workers, by imposing heavier taxation. It follows that only motivated workers benefit from a social planner. When motivated workers constitute a minority in the economy, politicians are likely to act in the interest of lazy and regular voters and strive for minimum cost of government.

6 Concluding Remarks

In this paper we have shown that the presence of lazy bureaucrats may indicate that the government is cost-efficient. When civil servants’ effort is verifiable, the government optimally attracts, besides motivated workers, the laziest workers in the economy. To increase rent extraction from the motivated workers, the government gives lazy workers weaker incentives than private firms do. This is costly, as the public firm has to employ additional lazy workers to keep production at the desired level. The government reduces these costs by giving the motivated workers stronger incentives than private firms do. These distortion are cost-efficient, but reduce social welfare. However, both lazy and regular workers benefit from the decrease in taxes, giving politicians an incentive to minimise cost of government. When effort is unverifiable, lazy people find working in the public sector highly attractive and may crowd out workers with a public sector motivation.

We have restricted $Q$ such that two worker types are sufficient. It is a straightforward repetition of the analyses to allow for values of $Q$ such that the public firm needs all three worker types. When the difference in general work ethic $\theta$ between lazy and regular workers is sufficiently large, the contract for lazy workers is not distorted, whereas the public firm distorts the contracts for motivated and regular workers. Otherwise, the contract for lazy workers will be distorted as well. In the limit, when $Q \to \infty$, the public firm does not distort any contract, as can be seen from first-order condition (14). When the firm needs a great number of non-motivated workers, the costs of the inefficient contract for non-motivated workers are large compared to the benefits of rent extraction from the motivated workers.

In our analysis, the government’s monopsony power enables it to reduce costs by extracting rents from motivated workers. However, competition between public agencies would drive up the wage of motivated workers.

\[24\text{When taxes are distortionary, the social planner trades off the inefficiencies arising from taxation against the inefficiency of distorting the contracts of the workers in the public sector, as in e.g. Laffont and Tirole, (1993).}\]

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until the agencies are indifferent between lazy and motivated workers. When effort is verifiable, contracts are not distorted and the agencies are indifferent between all three worker types. As competition increases costs, the agencies would benefit from establishing of a central wage-setting organisation.

A Appendix

Proof that \( \frac{\partial w_i}{\partial \theta_i} < 0 \) for lazy and regular workers

Wage \( w_i \) specified by participation constraint (8) decreases in \( \theta_i \) for lazy and regular workers. Using (5), we find that:

\[
\frac{\partial w_i}{\partial \theta_i} = [p - \theta_i C'(e_i^*)] \frac{\partial e_i}{\partial \theta_i} - C'(e_i^*) + C(\bar{e}) = -C(e_i^*) + C(\bar{e}) < 0
\]

where the first term drops by first-order condition (4). The inequality follows from the restriction \( \bar{e} < e_i^* \). Hence, lazy workers are attracted at a lower wage than regular workers.

Derivation of total cost in the benchmark case with verifiable effort and two worker types

In Section 3.2, we have shown that the public firm prefers to attract motivated workers, and is indifferent between lazy and regular workers. When the firm employs lazy or regular workers, the marginal cost of another unit of effort provided by a lazy or regular worker is \( p \), as these workers exert the same level of effort and earn the same wage as in the private sector. Hence, the firm attracts lazy or regular workers when the marginal cost of effort by the motivated workers exceeds \( p \). These marginal costs can be found by differentiating the participation constraint (8) with respect to \( e_m \). This gives:

\[
\frac{\partial w_m}{\partial e_m} = \theta_m C'(e_m) - \gamma_m V'(e_m)
\]

Hence, the public firm attracts a second worker type when \( Q > N_m e_m^\xi \), where \( e_m^\xi \) is defined by:

\[
\theta_m C'(e_m^\xi) - \gamma_m V'(e_m^\xi) = p
\]

Note that (A2) is identical to (6). Hence, \( e_m^\xi = e_m^x \), which is the optimal level of effort motivated workers would exert in the private sector if they would derive utility from working in the private sector. The public firm thus pays \( p \) per unit of effort provided by the workers, and extracts all motivational rents. This implies that total cost are equal to:

\[
Z = pQ - N_m \gamma_m V(e_m^\xi)
\]

Proof that \( \frac{\partial Z}{\partial \theta_k} < 0 \)
By substituting the production constraint (12), $n_m = N_m$, $IR_k$, $IC_m$, and (5) into total cost (11), we find:

$$Z = \left\{ pe_k^* - \theta_k[C(e_k^*) - C(e_k)] \right\} \left[ \frac{Q - (e_m - e_k)N_m}{e_k} \right] + N_m \left\{ \theta_m[C(e_m) - C(e_k^*)] - \gamma_m[V(e_m) - V(e_k^*)] \right\}$$

Keeping $e_m$ and $e_k$ constant, a marginal increase in $\theta_k$ leads to a decrease in $Z$:

$$\frac{\partial Z}{\partial \theta_k} = \left\{ \frac{p - \theta_k C'(e_k^*)}{\theta_k^*} - \left[ C(e_k^*) - C(e_k) \right] \right\} \left[ \frac{Q - (e_m - e_k)N_m}{e_k} \right] < 0$$

The first term is zero by (4). The second term is negative, as the firm sets $e_k < e_k^*$ (see first-order condition (14)). Hence, for constant $e_m$ and $e_k$, total cost decrease in the laziness of the second worker type. The change in $\theta_k$ is likely to affect $e_m$ and $e_k$ as well, but since these effects run though the optimisation problem of the firm (first-order conditions (13) and (14)), any changes in $e_m$ and $e_k$ only strengthen the negative effect of $\theta_k$ on $Z$.

**Proof that cost-minimisation and welfare-maximisation yield identical results when effort is unverifiable**

A cost-minimising public firm minimises $Z = n_i w_i$. Substitution of $n_i = Q/e_i$ and (8) gives optimisation problem

$$\min_i \left\{ \frac{Q}{e_i} \left[ U_i^* + \theta_i C(e_i) - \gamma_i V(e_i) \right] \right\}$$

A welfare-maximising public firm maximises (18) with respect to type $i$. This gives:

$$\max_i \left\{ \frac{Q}{e_i} \left[ -U_i^* - \theta_i C(e_i) + \gamma_i V(e_i) \right] \right\}$$

Obviously, these two optimisation problem yield the same results.

**Proof that cost-minimisation and welfare-maximisation yield identical results when effort is verifiable and $Q$ is sufficiently small**

In Section 4.2, we have shown that for a cost-minimising public firm, the contract derived in Section 3.2 is optimal if effort is verifiable and $Q$ is sufficiently small, such that the public firm needs only one worker type. A welfare-maximising public firm maximises (18) with respect to $e_i$, subject to production constraint $n_i = Q/e_i$. This gives first-order condition:

$$- \left[ \theta_i C'(e_i) - \gamma_i V'(e_i) \right] + \frac{U_i^* + \theta_i C(e_i) - \gamma_i V(e_i)}{e_i} = 0$$

which is, except for opposite signs, identical to first-order condition (9) derived in Section 3.2. It immediately follows that the optimal contract is identical to that in Section 3.2, and, hence, to the optimal contract if the public firm minimises cost.
Conditions under which hiring two types of workers is optimal

In the remainder of this appendix, we show that for each case considered in the main text, there exist a level of \( Q \) for which it is optimal for the public firm to hire two types of workers instead of one.

**All cases, unverifiable effort**

Because the public firm can not induce workers to exert a certain level of effort, it is necessary to attract a second worker type as soon as \( Q > N_i e_i \), where \( i \) is the worker type the firm prefers to employ, as derived in the main text. Recall that if worker type is not observable, it might happen that the public firm can not single out its most preferred type. Then, the public firm always employs two worker types.

**Benchmark, verifiable effort**

See the above derivation of total cost in the benchmark case with two worker types.

**Cost-minimisation, verifiable effort**

First, consider the case where the participation constraint of motivated workers \( IR_m \) binds, while the revelation constraint \( IC_m \) is non-binding. In Section 4.2, we have shown that the public firm prefers to hire lazy workers over regular workers, and that lazy workers are induced to exert the optimal level of effort. Hence, the marginal cost of effort of hiring additional lazy workers is \( p \). This implies that the public firm hires lazy workers as soon as the marginal cost of effort of motivated workers exceeds \( p \). As this is equal to the benchmark case, the public firm attracts lazy workers when \( Q > N_m e_m^\xi \), where \( e_m^\xi \) is defined by (A2) (and (6)).

Next, consider the case where the revelation constraint of motivated workers \( IC_m \) binds, while the participation constraint \( IR_m \) is non-binding. Consider the level of production \( Q = N_m e_m^\ast \). Total cost with one worker type, denoted by \( Z_1 \), is then given by:

\[
Z_1 = N_m \left[ U_m^\ast + \theta_m C \left( \frac{Q}{N_m} \right) - \gamma_m V \left( \frac{Q}{N_m} \right) \right] \quad (A3)
\]

If the public firm offers contracts for both lazy and motivated workers, the revelation constraint \( IC_m \) has to be fulfilled, even though the public firm only employs motivated workers at this level of \( Q \). Suppose the public firm would create contracts specifying \( e_l = e_l^\ast \) and \( e_m = e_m^\ast \). Total cost, denoted by \( Z_2 \), is then given by:

\[
Z_2 = N_m \left\{ U_l^\ast + \theta_l C(e_l^\ast) + \theta_m [C(e_m^\ast) - C(e_l^\ast)] - \gamma_m [V(e_m^\ast) - V(e_l^\ast)] \right\} \quad (A4)
\]

Clearly, \( Z_1 < Z_2 \). The properties of \( C(\cdot) \) and \( V(\cdot) \) imply that for higher levels of \( Q \), \( Z_1 \) is a convex function of \( Q \): \( \frac{\partial Z_1}{\partial Q} > 0 \), \( \frac{\partial^2 Z_1}{\partial Q^2} > 0 \). However, if the firm attracts both lazy and motivated workers, the marginal cost of effort by hiring additional lazy workers is \( p \), as the contract for the lazy workers makes them exert as much effort as they do in the private sector.
Hence, \(Z_1\) is convex and increasing in \(Q\), while \(Z_2\) is linearly increasing in \(Q\), implying that there exists some level of \(Q > N_m^e_m^*\) for which \(Z_1 = Z_2\). Moreover, recall that in section 4.2, we have derived that the public firm distorts the contracts of its workers so as to decrease cost. This implies that \(Z_2\) is actually smaller than derived above. Hence, there exists some level of \(Q\) for which it is optimal to hire both lazy and motivated workers.

**Social planner, verifiable effort**

As the public firm induces lazy and regular workers to exert the same level of effort as in the private sector, this case is similar to the benchmark case. The public firm attracts lazy or regular workers as soon as the marginal cost of working of the motivated workers exceeds \(p\). Hence, the public firm attracts a second worker type when \(Q > N_m^e_m\), where \(e_m^*\) is defined by (A2) (and (6)).

**References**


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