Absolute Power Corrupts Absolutely?: A Political Agency Theoretic Approach

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30 May 2024

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May 2024

Abstract:

We explore a power relationship between a 'corrupt' politician and a political worker where the politician can order an illegal corrupt effort to be performed by the worker. Using a moral hazard structure we show that when the politician's power is sufficiently high the politician optimally uses power and relies less on wage incentives. But when the power is low, the politician optimally shuns power and relies more on wage incentives. We also talk about optimal bolstering of power through threats depending on the level of power of the politician. This model has implications on the larger principal-agent structure, although we model it as a political corruption game.

Keywords: Power, Corruption, Hidden Action, Perception, Bolstering.
JEL Classification: D86, J47, K42.

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1. Introduction:

Power is an essential ingredient in economic relationships, we often encounter the words like 'market power' and 'bargaining power' which also have 'power' in it. But in this paper we will not talk about 'market power' or 'bargaining power' or any 'economic power' as such but something more. Specifically we will talk about political power through a politician - political worker hidden action game where the politician will have some 'power' to 'order' the worker to take some action - in our model an 'improper' or a 'corrupt' action that will eventually benefit the politician. Our use of the term 'corruption' needs a clarification. Here we use the term 'corruption' since the politician 'orders' the political worker to take an action which is 'improper' over an action that is 'proper'. We will explain the above concept of 'proper' and 'improper' actions in detail below but before that a word about our analytical structure. The structure we use is a modified version of the hidden action framework used in Akerlof (2017) although the issue addressed in that paper is completely different.[1] Coming back to our story, we take a specific example where a 'corrupt' politician (principal, he) interacts with a political worker (agent, she) to work on a project, we take it as a 'social project'.[2] The project can be on 'spreading primary education' or 'providing public toilets' for the poor or something similar. The political worker can put in two kinds of efforts; first is a proper effort that increases the probability of success in the 'true' sense. Examples of proper efforts can be the following: arranging teachers, forming student groups, collecting study materials or books, in case of 'spreading primary education' or arranging plumbers, supervising whether public toilets are

[1] Akerlof (2017)'s addresses the issue of legitimacy whereas our focus is power in a principal-agent hidden action structure.

[2] The politician need not be a singular, it can be a political party. The political agent also need not be singular and can be a group or an 'organization', although non-singularity might lead to difficulty on ordering or causing harm in case of disobedience.

properly built or monitoring the work properly in case of 'providing public toilets' scheme. The second kind of effort which is an improper or a corrupt or a bad effort helps in 'showing' that the project has achieved success. Several examples of this kind of effort can be given. The worker can fudge documents to show that the project has succeeded. Or, the worker can arrange a campaign spree or make fake videos to spread the news that the project has succeeded although the project might have fallen short of the desired outcome. He can also bribe or manage the public media so that the 'success story' is spread across the board. Or, he can also threaten people of an area (even with the help of the police) so that they lie and vouch for the success of the project (out of fear of retribution) in case there is a survey on the project's success. Overall, the 'perceived success' of the project will depend on both kinds of efforts put in by the worker, proper and improper. The politician gains more from the improper effort since it is easier to achieve 'perceived success' than 'true success'. We assume that the politician is 'powerful' and therefore can optimally 'order' the worker to put in the improper effort since he gains more from that effort compared to the proper effort.[3] The 'power' can originate from political power, or he can be a strongman or a goon or a criminal. The worker can potentially bear a huge cost from disobeying the powerful politician, examples ranges from physical harm or destruction of property caused by the politician. If the politician is less powerful the disobedience cost is lower. The worker bears an additional psychological cost from putting in the improper effort. In addition to ordering the improper effort, the politician can also offer a wage contract (or financial incentive) to elicit both kinds of efforts. Given the above structure we try to find the optimal 'order' that the politician will give and the optimal wage incentive that the politician might offer the worker depending on how 'powerful' he is. We show that when the politician's power is

[3] Or it is easier to achieve 'perceived success' rather than 'true success', or success is easier to achieve through the 'improper' way compared to the 'proper' way. Any of the previous interpretations will go through with our structure.

sufficiently high the politician optimally uses power and orders the improper effort and relies less on financial or wage incentives. If the politician's power is low, the politician optimally shuns power and relies more on financial or wage incentives. We also discuss the possibility of bolstering of power by the politician through threats depending on the level of power of the politician. We show that optimal threats and therefore bolstering of power is positive only when the politician's power is at the moderate level. For very high power or very low power the politician does not bolster power, i.e. the optimal level of threat is zero. We also analyze a specific instance where the politician is indifferent between exercising power and working through wage incentives.

Although we pose this problem as a political agency relationship between a corrupt politician and a political worker that we often encounter in developing countries like India, this framework is applicable in every standard principal-agent relationship where the principal gains from an improper or corrupt activity, even in a standard organizational framework where there is a power structure, i.e. where power is an essential ingredient in that relationship. In all these situations, the principal can order the agent to perform a corrupt task and the agent being at the mercy of the principal can obey and oblige, in spite of paying a psychological cost. But we chose this developing country type political agency game since we think this fits our structure best. We will discuss this aspect more at the end.

As already mentioned earlier, to achieve our target we modify the structure provided in Akerlof (2017), where he analyzed authority of a principal and how levels of authority provides legitimacy to the principal's orders. In Akerlof (2017) higher levels of authority provides greater legitimacy to the principal's orders. Below we spell out the differences of our paper with that of Akerlof (2017). First, we analyze a political power game where a powerful corrupt politician orders an improper corrupt action to be performed by a political worker. Akerlof (2017) on the other hand addresses the issue of legitimacy and how that depends on the level of principal's authority. Second, in Akerlof's model the principal only gains through the proper effort whereas in our model the politician gains through both kinds of efforts, but gains more through the improper effort. Third, in Akerlof (2017) the principal orders the proper effort whereas in our model the politician orders the improper or the corrupt effort. Fourth, in our model the political worker bears an additional psychological cost from performing the improper task whereas in Akerlof (2017) the cost of both kinds of efforts has similar structure. Fifth, in our structure financial or wage incentives will have a role for all levels of power in eliciting the desired effort levels (proper or improper) but in Akerlof (2017) financial or wage incentives had a role in eliciting efforts only when the level of authority is low. Finally, we analyze different functional specifications of the disobedience cost and also explore the implication of limited liability in our political-agency game which was not there in Akerlof (2017). To the best of our knowledge this is the only paper that analyzes a political corruption game in a principal agent hidden action framework that links corruption with political power. This is the main contribution of this paper. The ranges of power are also determined endogenously from our model.

Relation to the Literature:

This paper contributes to the literature on the economics of power. This is a vast issue and as already mentioned earlier 'power' or 'economic power' is implicit in almost every economic relationship. The shorter side of the market will have some market power over the longer side of the market.[4] In the standard agency models it is implicitly assumed that the

[4] This is true in the economic sense, not in other aspects like collective uprising, activism or even democratic power. In these cases more is number of people or the critical mass, the greater will be the power.

principal has all the bargaining power since the principal offers the contract and tries to push the agent to his reservation payoff as much as possible. Unfortunately "economists have treated power as the concern of other disciplines and extraneous to economic explanation" (Bowles and Gintis (2007)).[5] Few papers that tried to address and endogenize power from an economists' perspective were Samuels, (1973), Lindblom (1977), Bardhan (2005), Basu (1986), Takada, (1995), Hirshleifer (1991), Chichilnisky and Heal (1984), Lundberg and Pollak (1994), Rotemberg (1993), Pagano (1999). For an interesting discussion which to some extent transcends the philosophical boundary on 'economics and power' we refer the reader to Bowles and Gintis (2007). But in this paper we will talk about how the level of an 'improper' or corrupt act varies with differing levels of power. In our model the ranges of power are found endogenously from the model, and also the level of 'corruption' is endogenous and varies with the level of power. Thus our paper makes an attempt in endogenizing power and corruption which is also a contribution of this paper.

Power is also related to authority. A person who has authority can exert power over people who are lower in the authority hierarchy (Aghion and Tirole (1997), Akerlof (2017)). In developed nations with relatively strong and robust legal system this authority is mainly 'legal', but in relatively underdeveloped regions authority can stem from illegal brute-force power, sometimes political power. To elaborate it a bit, in stronger legal systems power stems from authority whereas in lax legal systems authority can stem from power that might have an illegal flavor. Our model can be applied to this brute-force political power where a politician who might be a criminal can harm anyone beyond imagination. Power is also related to the concept of

[5] Political scientists and sociologists have analyzed and addressed power extensively. For references see Lukes (1974) and Bowles and Gintis (2007).

coercion, i.e. a ‘sufficiently’ powerful person can coerce someone do something that he/she is unlikely to do without coercion.

Bowles and Gintis (1992) have defined power using the following quote: “*For B to have power over A, it is sufficient that, by imposing or threatening to impose sanctions on A, B is capable of affecting A’s actions in ways that further B’s interests, while A lacks this capacity with respect to B*”. Robert Dahl (1957, pp. 202–3) defines power as follows: ‘*A has power over B to the extent that he can get B to do something that B would not otherwise do.*’

As already stated, the source of power therefore can be ‘legal’ or ‘illegal’. In the developing country context many ‘strongman’ or ‘criminals’ have power (often political) which does not have any legal authority or validity. But they yield considerable amount of clout and muscle-power in the society and our model will capture a slice of that.

This paper also contributes to the economics of corruption literature. The principal-agent moral hazard framework is widely used to analyze issues in corruption starting from the seminal work of Mookherjee and Png (1995). For a detailed survey on papers addressing corruption in a moral hazard framework see Banerjee et.al. (2012) and for a recent updated survey see Wawrosz (2022). Banerjee et.al. (2012) addresses corruption in public bureaucracies where the bureaucrat has moral hazard incentives which eventually lead to red-tape, reduced quality of public services provided at the optimum. But very few papers explore the relationship between power and corruption in an agency framework. Our paper contributes in this dimension.

The structure of this paper is given as follows. In section 2 we lay down the basic structure of our model and analyze the optimal contracts. Section 3 addresses the possibility of bolstering of power. In section 4 we discuss a special case and section 5 discusses some possible extensions and relevance of the exercise. Section 6 provides concluding remarks.

2. Model:

To formalize the model we modify the hidden action structure provided in Akerlof (2017) and address an entirely different issue and make the model context specific. Let us consider a politician who needs a party worker to carry out a project. The project, as already mentioned in the introduction, can be a social project. The politician can be thought of as the principal and the worker can be thought of as an agent, in terms of the standard principal-agent structure. The project can either 'succeed' or 'fail', the outcomes are denoted by $q \in \{s, f\}$, where q is an outcome variable. The word 'success' needs some clarification in our paper. The project can 'succeed' in two ways. First, the project might truly succeed and achieve what it sets out for. Second the project can be 'shown' to be a success on paper (in public eye, for the optics or narrative creation) although it might not achieve the target for which it was proposed initially. Thus the 'success' of the project will depend on two kinds of efforts put in by the worker. First a proper effort e_1 that increases the probability of success in the true sense. The second kind of effort e_2 helps in 'showing' that the project has achieved success. Several examples of both kinds of efforts are already provided in the introduction. Put simply, e_2 can be thought off as an improper or corrupt effort to show q to be a success.

In addition to the above it is assumed that it is easier for the politician to 'show' that the project has succeeded than to achieve success in the true sense. Put differently, achieving success is relatively costly when the success is achieved in the 'true sense' than to create a perception that the project has succeeded. This is modelled in two ways. First, the perceived probability of success is given as $Pr(q = s) = \lambda e_1 + e_2$ where $\lambda < 1$, implying that an incremental increase in

e_2 works better in creating the perception that the project has succeeded.[6] Second, we assume that given the effort levels a gross surplus of $\gamma e_1 + e_2$ is generated for the politician irrespective of whether the project is perceived to be success or a failure, where $\gamma < 1$, implying that for the politician the marginal increment in payoff is more from an additional unit of e_2 rather than from e_1. This implies that the politician's net payoff function has the form $\pi^P = \gamma e_1 + e_2 - w$. Although we model this from the benefit side, this takes care of the cost interpretation as well.[7] The wage will be paid depending on whether the project succeeds or fails. For technical reasons for the time being we assume $\lambda > \gamma$. We will get back to this assumption later.

Both the efforts are assumed to be unobservable and hence non-contractible. This can be elaborated further. The proper effort e_1 is non-contractible in the standard sense of being non-verifiable in the court, whereas the improper effort in addition to being non-verifiable is also illegal or improper and therefore cannot be taken in front of the court for adjudication. Overall, in effect, both efforts are non-contractible. Efforts are costly for the worker and the costs of the efforts are given as $\frac{1}{2}e_1^2$ and $\frac{\tau}{2}e_2^2$ respectively. $\tau > 1$ is the parameter that measures the psychological cost of the worker from taking the improper action. Higher τ can also be interpreted as a relatively honest political-worker who incurs greater psychological cost from putting in the improper effort. The 'perceived' state of the nature, i.e. success or failure is contractible. In other words, there can be documentary evidence that the project is perceived to be a success, through fudged documents or through surveys on the outcome of the project that can be produced in the court, or the state of nature can be interpreted as electoral success or failure which to a large extent depends on public perception.

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[6] We talk in terms of perceived probability since in case of electoral politics 'perception' and/or 'narrative' is everything.

[7] We will talk about an alternative specification in an extension later.

Similar to Akerlof (2017) we assume that two tools are available to the politician in eliciting the desired efforts. First, he can give an order (θ) to the worker regarding the level of e_2 he would like. We assume that the politician only orders the improper effort since he gains more from that effort. The politician can also provide wage incentives to elicit the desired efforts, i.e. both e_1 and e_2 from the worker. Put differently the wage can be made a function of the 'perceived' outcome of the project, i.e. $w(s)$ given in case of success and $w(f)$ in case of failure. We assume both the politician and the worker to be risk-neutral.

The worker's payoff function has the form

$$U^A = w - \frac{1}{2}e_1^2 - \frac{\tau}{2}e_2^2 - 1_{e_2 \neq \theta}.D(\theta) \tag{1}$$

U^A is increasing in wage (w) and is decreasing in effort costs.

$D(\theta)$ is the loss that the worker suffers if he disobeys the politician's order on e_2. Several examples of $D(\theta)$ is already provided in the introduction. When the politician's power is high and the politician's order is commensurate with her power then it is costly for the worker to disobey the politician. This happens when $\theta \leq P$ where P parameterizes the extent of the politician's power. When $\theta \leq P$ holds we say that the politician maintains power. It is assumed that when the politician maintains power then it is infinitely costly for the worker to disobey the politician. This cost can be interpreted as the harm that the politician can inflict on the worker if she disobeys the order. But when $\theta > P$ we say that the politician gives an order that exceeds his power. In that case the worker can disobey the order and will not incur any cost. Put differently the politician does not have enough power to cause any harm to the worker if she disobeys, the order is beyond the politician's power stature.

Given the above specification, similar to Akerlof (2017), we assume the following:[8]

[8] We will examine the implications of a different specification of $D(\theta)$ as an extension later.

$$D(\theta) = \begin{cases} \infty, & \theta \leq P \\ 0, & \theta > P \end{cases} \quad (2)$$

$\theta \leq P$ can be referred to as the Power-Maintenance (PM) constraint. Put differently we say that the politician gives an order commensurate with his power stature if $\theta \leq P$. If $\theta > P$, then Power-Maintenance is violated and we say that the politician 'eschews' the use of power.

The timing of the game is given as follows:

Stage-1: The politician announces a wage scheme, $w(s)$ given in case of perceived success and $w(f)$ in case of perceived failure and can possibly give an order $e_2 = \theta$ to the worker.

Stage-2:

(a). The worker can decide to obey or disobey the $e_2 = \theta$ order. Also the worker can accept or reject the wage incentive. If the worker accepts the order then she does not pay any disobedience cost. If she disobeys the order then she might have to incur the cost $D(\theta)$ according to the specification given in (2). After that the perceived state of the nature is realized and payments (if any) are made according to the terms of the wage contract.

(b). If the worker rejects the contract both the politician and the worker gets zero.

Given above we proceed and analyze the optimal contracts between the politician and the worker. But before proceeding we make the following technical assumption:

Assumption 1: $\lambda\gamma + \frac{1}{\tau} < 1$.

The above assumption ensures that the optimal probability of success is always less than 1.

2.1 Optimal Contracts:

Before going into the realistic non-contractible efforts case, we look into the first best benchmark where the efforts are contractible. The first best efforts can be found by maximizing the joint surplus $\pi = \gamma e_1 + e_2 - \frac{1}{2}e_1^2 - \frac{\tau}{2}e_2^2$ and therefore the first best effort levels are $e_1^{FB} = \gamma > 0$ and $e_2^{FB} = \frac{1}{\tau} > 0$. Note that since both kinds of effort produces some benefit within the relationship, hence both the first best effort levels are positive. This is different to what we get in Akerlof (2017) where one kind of effort was non-productive for the politician and therefore the first best non-productive was zero.

2.1.1 Non-contractible efforts:

Now, let us work out to the realistic case (i.e., the second-best case) where efforts are non-contractible. The politician has two tools to elicit his desired effort.

Politician's problem is to choose a wage scheme $\{w(s), w(f)\}$ and an order $e_2 = \theta$ so as to maximize her expected payoff $E(\pi)$. Politician maximizes $E(\pi)$ subject to a Participation Constraint (PC) and an Incentive Compatibility Constraints.

The Participation Constraint (PC) can be written as follows:

$$E(U) = \left[w(f) + (\lambda e_1 + e_2)\big(w(s) - w(f)\big)\right] - \frac{1}{2}e_1^2 - \frac{\tau}{2}e_2^2 - 1_{e_2 \neq \theta}.D(\theta) \geq 0 \qquad (3)$$

The incentive compatibility constraint that the politician faces depends upon whether the power is maintained or not. If the politician satisfies the Power Maintenance (PM) constraint, he faces the following ICCs:

$$e_1 = \lambda\big(w(s) - w(f)\big) = \lambda w; \quad e_2 = \theta \qquad \text{(ICCs when the Power is maintained)}$$

where $w = w(s) - w(f)$.

If the politician violates the Power Maintenance (PM) constraint or he shuns power, he faces the following ICCs:

$$e_1 = \lambda\big(w(s) - w(f)\big) = \lambda w, \; e_2 = \frac{w(s) - w(f)}{\tau} = \frac{w}{\tau} \qquad \text{(ICCs - Power is not maintained)}$$

The politician has two choices. He can maintain power and obey the Power Maintenance (PM) constraint and face incentive constraints where power is maintained. These are better incentive constraints since the politician can possibly order the second type of effort directly. Or he can shun the use of power and elicit both types of effort through wage incentives. In this case he faces inferior incentive constraints since he does not order any effort and elicits both efforts indirectly through financial incentives. When the politician does not have much power it might be optimal for him to shun the use of power and use only wage or financial incentives per se. In our structure the politician always uses some wage incentives irrespective of the level of power since all efforts add value to the politician's payoff, but the wage incentives are higher when the politician decides to shun power as a tool to incentivize. Our first proposition formalizes the optimal incentive structure depending on different levels of power of the politician.

Proposition 1. *The solution to the politician's problem depends upon whether his power (P) is low, medium, or high.*

(a). For high power $\left(P \geq \frac{1}{\tau}\right)$ *the politician orders the first-best* $\theta = \frac{1}{\tau}$. *Wage incentive is given as* $\left(w(s) - w(f)\right) = \frac{\gamma}{\lambda}$. *The worker puts in first best efforts* $e_1 = \gamma, e_2 = \frac{1}{\tau}$. *First best improper effort falls with increased* τ.

(b). *For medium power* $\left(\frac{1}{\tau} - \frac{(\lambda-\gamma)}{\sqrt{\tau(\lambda^2\tau+1)}} \leq P < \frac{1}{\tau}\right)$ *the politician gives the maximum possible order using his power i.e.,* $\theta = P$ *; optimal incentives payment is* $\left(w(s) - w(f)\right) = \frac{\gamma}{\lambda}$ *and efforts are* $e_1 = \gamma, e_2 = P$. *The proper effort is at the first best, the improper effort is lower than the first best.*

(c). If politician's power is low $\left(P < \frac{1}{\tau} - \frac{(\lambda-\gamma)}{\sqrt{\tau(\lambda^2\tau+1)}}\right)$, *he shuns power and relies only on wage incentives to elicit both kinds of effort. So optimal wage incentive is* $w(s) - w(f) = \frac{\gamma\lambda\tau+1}{\lambda^2\tau+1}$ *and optimal effort levels are* $e_1 = \frac{\lambda(\gamma\lambda\tau+1)}{\lambda^2\tau+1}$ *and* $e_2 = \frac{\gamma\lambda\tau+1}{\tau(\lambda^2\tau+1)}$. *The proper effort* ($e_1$) *is more than the first best, the improper effort* (e_2) *is less than the first best.*

(d). Wage incentive is higher when the politician shuns the use of power compared to when the politician maintains power.

Proof: See Appendix.

If the politician has sufficient power such that $P \geq \frac{1}{\tau}$, the politician can order the first best improper effort without depending too much on wage incentives. But since the proper effort also adds value to the politician's payoff he uses some wage incentive to elicit the proper legitimate effort. But since the politician uses orders to elicit e_2 his dependence on wage incentive is lower. In this case the power constraint does not bind. The worker obeys since the cost of disobeying is too high since the politician has sufficient power. Even with this lower wage incentive the politician can elicit the first best proper effort from the worker. When the level of power in medium the politician cannot order the first best e_2 to be implemented, but can order the maximum possible illegitimate order $\theta = P$ and at the optimum the PM constraint will bind. Once again positive wage incentive is needed and the first best legitimate effort can be implemented. When the politician's power is sufficiently low, the politician shuns the use of power and only uses wage incentives to elicit both kinds of efforts. Since the power is sufficiently low the politician does not gain from using power and therefore will not gain from ordering the improper effort and therefore uses high wage incentives to elicit effort rather than using power. This wage incentive is higher compared to when the politician exerts power and therefore the optimal proper effort exerted is more than the first best but the improper effort is less than the first best. This has implications for the political economic literature in the sense that it might be better (in terms of proper effort) if the politician is not a strongman or a criminal and therefore does not have 'power' such that he can order the improper effort.

In the next section we consider the possibility of the bolstering of power by the politician.

3. Optimal Threat and Bolstering Power:

The politician can choose to bolster his power through coercive measures or may be through threats. By this way the politician can expand his power and influence and thus order the improper corrupt activity optimally. We model this in the following way: suppose the politician's initial level of power is P_0 and the politician decides to bolster power by making threats denoted by t. So post threat, power becomes $P = P_0 + t$. We assume that threatening is costly for the politician and the cost is given by $\frac{t^2}{2}$. The cost can be interpreted as reduced reputation or reduced respect that the politician might command post threat. Given above we characterize the optimal level of threat depending on the different levels of power of the politician:

Proposition 2:

(a). If power is high $(P_0 \geq \frac{1}{\tau})$ *the optimal level of threat is zero i.e.,* $t^* = 0$. *The politician orders the first-best* $e_1 = \gamma,\ e_2 = \theta = \frac{1}{\tau}$ *and the optimal incentive will be* $w(s) - w(f) = \frac{\gamma}{\lambda}$. *Both the efforts are at the first best level.*

(b). If power is medium $\left(\frac{1}{\tau} > P_0 \geq \frac{1}{\tau} - \frac{1}{\tau}\sqrt{1+\tau\left[1-(1+\tau)\left[\frac{[(\gamma\lambda\tau+1)^2}{\tau[(\lambda^2\tau+1)]} - \gamma^2\right]\right]}\right)$ *the optimal level of threat will be* $t^* = \frac{1-\tau P_0}{1+\tau} > 0$. *The optimal bolstered power will be* $P = \frac{1+P_0}{1+\tau}$. *The optimal wage incentive* $w(s) - w(f) = \frac{\gamma}{\lambda}$; *and optimal efforts are* $e_1 = \gamma, e_2 = \theta = P = \frac{1+P_0}{1+\tau}$.

(c). If power is low $\left(P_0 < \frac{1}{\tau} - \frac{1}{\tau}\sqrt{1+\tau\left[1-(1+\tau)\left[\frac{[(\gamma\lambda\tau+1)^2}{\tau[(\lambda^2\tau+1)]} - \gamma^2\right]\right]}\right)$ *then the optimal threat is* $t^* = 0$. *The optimal wage incentive will be* $w(s) - w(f) = \frac{\gamma\lambda\tau+1}{\lambda^2\tau+1}$ *and optimal efforts will be* $e_1 = \frac{\lambda(\gamma\lambda\tau+1)}{\lambda^2\tau+1}$ *and* $e_2 = \frac{\gamma\lambda\tau+1}{\tau(\lambda^2\tau+1)}$.

(d). Optimal threat (weakly) falls with τ.

Proof: See Appendix.

When the politician has high power then he does not gain by threatening since there is no additional benefit from incurring the cost of bolstering power, since he already has sufficient power. For moderate power the politician gains from bolstering power through threat and in this situation the optimal threat is positive. Finally if the politician has low power then it might be prohibitively costly for the politician to bolster power through threat since the benefit from bolstering power gets outweighed by the cost of threatening and bolstering power. Therefore only a moderately powerful politician will find it optimal to bolster power through threat.

4. A Pathological scenario: First best always?

Suppose we change the original specification and assume that the politician gets a return of 1 when the project is perceived as a success with probability $(\lambda e_1 + e_2)$ and 0 if the project is perceived as a failure. Therefore the expected payoff of the politician will effectively have the structure $\pi^P = \lambda e_1 + e_2 - w$ which implies that we get $\gamma = \lambda$. Given this, at the optimum, the medium power range $\frac{1}{\tau} - \frac{(\lambda-\gamma)}{\sqrt{\tau(\lambda^2\tau+1)}} \leq P < \frac{1}{\tau}$ will not exist. Interestingly, this is the case where the politician becomes indifferent between exerting power or shunning power and working through financial incentives and this holds for all ranges of P. Under this changed specification the optimal incentive structure will be given as

Proposition 3:

(a). Irrespective of the ranges of P the politician implements the first best efforts $e_1 = \gamma = \lambda$, $e_2 = \frac{1}{\tau}$ either through order $\theta = \frac{1}{\tau}$ and/or through financial incentives $\left(w(s) - w(f)\right) = 1$.

This pathological case is similar to the case of a risk-neutral principal interacting with a risk-neutral agent without limited liability where efforts are at the first best. Irrespective of the level of power the financial incentives works equally well and power and ordering loses its bite. Also note that in this case the politician does not gain by bolstering power and therefore optimal threat will be 0 for all levels of P.

5. Extensions:

5.1. Limited Liability:

Let us explore the implication of limited liability in our structure. Put differently, suppose that the politician cannot pay negative wage if the verifiable signal of the social project is bad. This kind of situation may happen when the corrupt politician (or a political party) hires an organization instead of a political worker or a person. Because it is difficult to penalize an organization in case of perceived failure, a political principal can face a natural limited liability constraint.[9] But it is still feasible for a political party to order (albeit politely) the organization to take some improper action that might create a perception of success (circulating fake videos of success, creating narratives etc.) which the organization might readily agree to.[10]

Given the above discussion we impose a limited liability constraint that is $w(j) \geq 0, \forall\, j = s, f$ implying that the politician cannot offer negative wage to the political agent and to focus starkly on limitedly liable contracts, we assume that the limited liability constraint binds, i.e., the politician sets $w(f) = 0$. The politician's problem is to choose a success wage $w(s)$ and an order $e_2 = \theta$ (if he exercises power) so as to maximize her expected payoff $E(\pi)$ subject to a participation and the incentive compatibility constraints. When power is maintained and an order is given, even with limited liability it is optimum for the politician to offer $w(s)$ such that the participation constraint binds. Keeping this is mind and carrying out the entire exercise we get the following result which is in essence similar to Proposition 1:

Proposition 4:

(a) For high power $\left(P \geq \frac{1}{\tau}\right)$ *the politician orders the first-best* $\theta = \frac{1}{\tau}$. *The success wage will be set at* $w(s) = \frac{1}{\lambda^2\tau}\left[\sqrt{1+\lambda^2\tau} - 1\right] > 0$. *Optimal efforts will be* $e_1 = \frac{1}{\lambda\tau}\left[\sqrt{1+\lambda^2\tau} - 1\right], e_2 = \frac{1}{\tau}$. *The proper effort is productive but less than the first best; the improper effort is at the first best.*

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[9] As an example, during the 2021 assembly elections in the state of West Bengal India, the ruling Trinamool Congress (TMC) hired an organization called Indian Political Action Committee (IPAC) as a consultant for the proposals and actions to be taken to ensure that TMC wins the election.[9] The nodal person of IPAC Prashant Kishor played a crucial role in the TMC' victory in West Bengal. The TMC was able to reclaim lost territory throughout the state through Kishor's outreach initiatives.[9] Ex ante the outcome of the election was unknown to both TMC and IPAC, but writing a contract which stipulates a penalty in case of a possible election loss was not an option. IPAC would not have accepted such a contract.

[10] There is no need to believe that these organizations always encourage proper effort over improper.

(b) For medium power $\left(\frac{\left[\frac{\gamma}{\lambda}\left[\sqrt{1+\lambda^2\tau}-1\right]+1\right]-\sqrt{\left[\frac{\gamma}{\lambda}\left[\sqrt{1+\lambda^2\tau}-1\right]+1\right]^2-\frac{\left[\sqrt{1+\lambda^2\tau}-1\right](\gamma\lambda\tau+1)^2}{\lambda^2\tau\sqrt{1+\lambda^2\tau}}}}{\frac{2}{\lambda^2}\left[\sqrt{1+\lambda^2\tau}-1\right]\left[\sqrt{1+\lambda^2\tau}\right]} < P < \frac{1}{\tau}\right)$ *the politician gives the maximum possible order using his power i.e.,* $\theta = P$ *; optimal success wage is* $w(s) = \frac{P}{\lambda^2}\left[\sqrt{1+\lambda^2\tau}-1\right]$*. Optimal efforts will be* $e_1 = \frac{P}{\lambda}\left[\sqrt{1+\lambda^2\tau}-1\right], e_2 = P$*. The proper effort is productive and less than the first best, the improper effort is lower than the first best.*

(c) If the politician has low power, i.e.

$\left(0 < P < \frac{\left[\frac{\gamma}{\lambda}\left[\sqrt{1+\lambda^2\tau}-1\right]+1\right]-\sqrt{\left[\frac{\gamma}{\lambda}\left[\sqrt{1+\lambda^2\tau}-1\right]+1\right]^2-\frac{\left[\sqrt{1+\lambda^2\tau}-1\right](\gamma\lambda\tau+1)^2}{\lambda^2\tau\sqrt{1+\lambda^2\tau}}}}{\frac{2}{\lambda^2}\left[\sqrt{1+\lambda^2\tau}-1\right]\left[\sqrt{1+\lambda^2\tau}\right]}\right)$ *he will not order and will rely on wage incentives to elicit both kinds of effort. So optimal wage incentive is* $w(s) = \frac{\gamma\lambda\tau+1}{2(\lambda^2\tau+1)}$*. Optimal efforts will be* $e_1 = \frac{\lambda(\gamma\lambda\tau+1)}{2(\lambda^2\tau+1)}$ *,* $e_2 = \frac{\gamma\lambda\tau+1}{2\tau(\lambda^2\tau+1)}$ *.*

Proof: See Appendix.

The noteworthy difference vis-à-vis the standard hidden action literature is that when limited liability binds, when the agent's outside option is very low the participation constraint might not bind. But in our model when the politician maintains power and orders, that create an additional disutility for the agent and therefore at the optimum the principal can offer a success wage such that the participation constraint binds. But when power is not maintained or shunned, the participation constraint does not bind which is what we get in standard models with hidden action.

5.2: Robustness: Specific Functional form of Disobedience Cost and a different approach

To check the robustness of our main model, we talk about to two changes in our prior modelling approach in this subsection. First, till now we have assumed that when the politician maintains power then it is infinitely costly for the worker to disobey the politician. Put differently the politician can inflict substantial harm on the worker if she disobeys the order. This assumption simplified our analysis to a great extent and we were able to focus on our central point without much complication. In this subsection we discuss the implications of a smooth $D(\theta)$ function and point out the differences in our analysis briefly. We modify the $D(\theta)$ function as follows:

$$D(\theta) = \begin{cases} \frac{1}{2}(\theta - e_2)^2 \ , & \theta \leq P;\ e_2 \leq \theta \\ 0\ , & \theta > P\ or\ e_2 > \theta \end{cases}$$

When the politician maintains power, i.e. $\theta \leq P$ holds then the cost of disobedience is $\frac{1}{2}(\theta - e_2)^2$ assuming that the improper effort does not exceed what is being ordered. But when the politician does not maintain power or shuns power and also if the worker puts in more effort than what is being ordered, the cost is zero.

Second, we assume that when the order $e_2 = \theta$ is given, it affects the worker's payoff only through the disobedience cost. Otherwise if we take $e_2 = \theta$ as an incentive constraint (as in our previous analysis), when the order is carried out $D(\theta) = 0$ always and we exactly go back our earlier structure. Thus to examine some possible non-trivial changes we assume that the order affects the worker's payoff only through $D(\theta)$. We do not impose limited liability in this context.

Given above changed specification, when efforts are contractible the first best efforts are found by maximizing the joint surplus $\gamma e_1 + e_2 - \frac{1}{2}e_1^2 - \frac{\tau}{2}e_2^2 - \frac{1}{2}(\theta - e_2)^2$ and the first best efforts turn out to be ${e_1}^{FB} = \gamma$ and ${e_2}^{FB} = \frac{1+\theta}{1+\tau}$. Now to find the optimal order θ one can take a two-step approach like plugging in ${e_1}^{FB}$ and ${e_2}^{FB}$ in the joint surplus function and optimizing with respect to θ and we get $\theta^{FB} = \frac{1}{\tau}$ and therefore we get ${e_2}^{FB} = \frac{1}{\tau}$. This approach is like as if the social planner first decides on the optimal order and then chooses the optimal contractible efforts accordingly. What we get is even with the changed specification we get back our earlier first best efforts.

Next, even under non-contractibility, when power is maintained the incentive compatibility constraints will be $e_1 = \lambda w$ and $e_2 = \frac{w+\theta}{1+\tau}$ where $w = w(s) - w(f)$. Note that the only change is that now the improper effort becomes a function of order θ indirectly and is also a function of $w = w(s) - w(f)$. Solving the entire problem we get is the following: For high power the politician orders the first-best $\theta = \frac{1}{\tau}$ but the improper effort $e_2 = \frac{\gamma\lambda\tau+\lambda^2+1}{\tau(\lambda^2(1+\tau)+1)}$ is less than the first best. For medium power the order is $\theta = P$ and the improper effort is $e_2 = \frac{(\gamma\lambda(1+\tau)+1)+P((\lambda^2(1+\tau)+1)}{(\lambda^2(1+\tau)+1)(1+\tau)}$ is less than the first best. For low power the politician once again will optimally shun power and the improper effort $e_2 = \frac{\gamma\lambda\tau+1}{\tau(\lambda^2\tau+1)}$ is less than the first best. In all the above cases the proper effort is more than the first best. The noteworthy difference with our main model is that the improper effort in all cases is less than the first even if the order is first best for high power. This is due to the fact that in this changed specification, the order effects the payoff of the agent through the disobedience cost and is not directly ordered and therefore the improper effort depends also on the wage incentive. This lack of 'direct' ordering leads to suboptimal improper effort even when the order is at the first best level. Overall in this scenario the politician has to rely more on wage incentive and therefore the proper effort (which depends solely on wage incentives) is more than the first best. Apart from this, the rest is roughly similar to our main model and thus the earlier disobedience cost structure works well in bringing out the interaction of power and corruption that we so in our main model.

6. Conclusion and Discussion:

In this paper we explore a power relationship between a politician and a political worker where the politician can order an illegal corrupt effort to be performed by the worker. The corrupt effort adds to the politicians benefit more than the proper legal effort. Using a moral hazard structure we show that when the politician's power is sufficiently high the politician optimally uses power and relies less on wage incentives. But when the power is low, the politician optimally shuns power and relies more on wage incentives. We also explore a case where the politician exercises absolute power at all levels. We also talk about optimal bolstering of power through threats depending on the level of power of the politician. Thus this theoretical model provides a framework to analyze the interaction between a (dishonest) powerful politician and a political worker and has implications on the larger principal-agent structure, although we model it as a political corruption game.

One can explore a multi political worker model where one political worker is more honest than the other and examine a political recruitment game. If the politician is corrupt then he might up recruiting the relatively dishonest person who is more likely to put in the improper effort and also the politician gains more from the improper effort. Thus a corrupt-politician corrupt-worker matching is likely, that we often see in politics in developing countries where criminals, strongman are the sought after candidates to work for a political party and are given all kinds of protection even at the government level. Although we do not model this in this paper, a natural extension can be in this direction.

APPENDIX

Proof of Proposition 1:

The politician maximizes expected payoff subject to the participation constraint, incentive compatibility constraint(s) and the power maintenance constraint (if power is maintained).

The politician's expected payoff is given as

$$E(\pi) = \gamma e_1 + e_2 - w(f) + (\lambda e_1 + e_2)\big(w(s) - w(f)\big)$$

The Participation Constraint (PC) can be written as follows:

$$E(U) = \big[w(f) + (\lambda e_1 + e_2)\big(w(s) - w(f)\big)\big] - \frac{1}{2}e_1^2 - \frac{\tau}{2}e_2^2 - 1_{e_2 \neq \theta}.D(\theta) \geq 0$$

If the politician satisfies the Power Maintenance (PM) constraint, she faces the following ICCs:

$$e_1 = \lambda\big(w(s) - w(f)\big) = \lambda w; \qquad e_2 = \theta \qquad \text{(IC –PM)}$$

If the politician shuns power she faces the following ICCs:

$$e_1 = \lambda\big(w(s) - w(f)\big) = \lambda w,\ e_2 = \frac{w(s) - w(f)}{\tau} = \frac{w}{\tau} \qquad \text{(IC – no PM)}$$

When the politician maintains power and satisfies the PM constraint then

$$\underset{w(s),w(f)}{Max}\ E(\pi) \text{ subject to } E(U) \geq 0 \text{ and } e_1 = \lambda w \text{ and } e_2 = \theta.$$

Internalizing $e_1 = \lambda w$ and $e_2 = \theta$ and setting $E(U) = 0$ from the participation constraint we get $w(f) = -\frac{1}{2}\lambda^2 w^2 - \theta w + \frac{\tau}{2}\theta^2$.

Substituting the ICCs and $w(f)$ in $E(\pi)$ and denoting $w = w(s) - w(f)$ we get

$$E(\pi) = \gamma\lambda w + \theta - [\frac{1}{2}\lambda^2 w^2 + \frac{\tau}{2}\theta^2]$$

Setting $\frac{\partial E(\pi)}{\partial w} = 0\ and\ \frac{\partial E(\pi)}{\partial \theta} = 0$ we get $w = \frac{\gamma}{\lambda}$ and $\theta = \frac{1}{\tau}$ respectively.

If $P \geq \frac{1}{\tau}$ the politician sets $\theta = \frac{1}{\tau}$. If $P < \frac{1}{\tau}$ and the politician maintains power the politician will set $\theta = P$. Taking this into account we can write the optimal order as $\theta = \min\{\frac{1}{\tau}, P\}$ when the politician maintains power.

Substituting optimal w and θ in $E(\pi)$ we get the optimal payoff when the politician maintains power as

$$E^{PM}(\pi) = \frac{1}{2}\gamma^2 + \min\{\frac{1}{\tau}, P\} - \frac{\tau}{2}[\min\left\{\frac{1}{\tau}, P\right\}]^2$$

The optimal success and failure wages will be

$$w(f) = -\frac{1}{2}\gamma^2 - \frac{\gamma \min\left\{\frac{1}{\tau}, p\right\}]}{\lambda} + \frac{\tau}{2}[\min\left\{\frac{1}{\tau}, p\right\}]^2$$

$$w(s) = \frac{\gamma}{\lambda} - \frac{1}{2}\gamma^2 - \frac{\gamma \min\left\{\frac{1}{\tau}, p\right\}]}{\lambda} + \frac{\tau}{2}[\min\left\{\frac{1}{\tau}, p\right\}]^2$$

If the politician violates PM or shuns power, he maximizes $E(\pi)$ subject to PC and IC – no PM.

$$\underset{w(s), w(f)}{Max} E(\pi) \text{ subject to } E(U) \geq 0 \text{ and } e_1 = \lambda w \text{ and } e_2 = \frac{w}{\tau}.$$

Once again from the binding participation constraint we get $w(f) = -\frac{1}{2}\lambda^2 w^2 - \frac{1}{2}\frac{w^2}{\tau}$.

Substituting $w(f)$ and internalizing the incentive compatibility constraints in $E(\pi)$ and optimizing subject to w, we get $w = \frac{(\gamma\lambda\tau+1)}{(\lambda^2\tau+1)}$. Since $w(s) - w(f) = w$ we get $w(s) = \frac{(\gamma\lambda\tau+1)}{(\lambda^2\tau+1)}(1 - \frac{(\gamma\lambda\tau+1)}{2\tau})$ and $w(f) = -\frac{(\gamma\lambda\tau+1)^2}{2\tau(\lambda^2\tau+1)}$.

The optimal payoff to the politician when she shuns power as $E^{NO-PM}(\pi) = \frac{(\gamma\lambda\tau+1)^2}{2\tau(\lambda^2\tau+1)}$.

For $P < \frac{1}{\tau}$, the politician decides to maintain power over shunning power if $E^{PM}(\pi) \geq E^{NO-PM}(\pi)$ if $\frac{1}{2}\gamma^2 + p - \frac{\tau}{2}p^2 \geq \frac{1}{2}\frac{[(\gamma\lambda\tau+1)^2}{\tau[(\lambda^2\tau+1)]}$ holds . Solving we get that the lower root will be the relevant and therefore the threshold value of P will be $\frac{1}{\tau} - \frac{(\lambda-\gamma)}{\sqrt{\tau(\lambda^2\tau+1)}}$. Thus if $P < \frac{1}{\tau} - \frac{(\lambda-\gamma)}{\sqrt{\tau(\lambda^2\tau+1)}}$, the politician will decide to shun power.

Also note that if $P \geq \frac{1}{\tau}$, $E^{PM}(\pi) > E^{NO-PM}(\pi)$, that is $\frac{1}{2}(\frac{\gamma^2\tau+1}{\tau}) \geq \frac{1}{2}\frac{[(\gamma\lambda\tau+1)^2}{\tau[(\lambda^2\tau+1)]}$, certainly since $\lambda > \gamma$.

In all the above cases the political agent earns her outside option equal to 0.

In regard to optimal efforts if $P \geq \frac{1}{\tau}$ the politician can implement the first best e_1 and e_2. The optimal efforts are $e_1 = \gamma, e_2 = \frac{1}{\tau}$. If $P < \frac{1}{\tau}$ the optimal efforts are $e_1 = \gamma, e_2 = P$, e_1 is first best but e_2 is less than the first best. If $P < \left[\frac{1}{\tau} - \frac{(\lambda-\gamma)}{\sqrt{\tau(\lambda^2\tau+1)}}\right]$, optimal efforts are $e_1 = \frac{\lambda(\gamma\lambda\tau+1)}{\lambda^2\tau+1}$ and $e_2 = \frac{\gamma\lambda\tau+1}{\tau(\lambda^2\tau+1)}$. e_1 is more than the first best and e_2 is less than the first best, given $\lambda > \gamma$.

Also note that $\frac{(\gamma\lambda\tau+1)}{\lambda^2\tau+1} > \frac{\gamma}{\lambda}$ given $\lambda > \gamma$, implying that the financial incentive is higher for $P < \left[\frac{1}{\tau} - \frac{(\lambda-\gamma)}{\sqrt{\tau(\lambda^2\tau+1)}}\right]$ compared to higher power ranges.

This completes the proof. **QED**

Proof of Proposition 2:

First take the case when the politician shuns power. In this situation, post bolstering, the payoff of the politician will be $E(\pi) = \gamma\lambda w + \theta - \left[\frac{1}{2}\lambda^2 w^2 + \frac{\tau}{2}\theta^2\right] - \frac{t^2}{2}$. Clearly in the limit optimal $t^* = 0$ and the optimal bolstering will be 0.

When $P > \frac{1}{\tau}$ the power maintenance is not binding and the politician has sufficient power to implement the first best efforts. So the politician does not gain from bolstering power since the politician already has sufficient power. Therefore $\mathrm{t}^* = 0$.

Interesting case is when $P \leq \frac{1}{\tau}$. Here post bolstering the politician's payoff is

$$E^{PM}(\pi) = \frac{1}{2}\gamma^2 + (P_0 + t) - \frac{\tau}{2}(P_0 + t)^2 - \frac{t^2}{2}$$

Maximizing $E^{PM}(\pi)$ we get the optimal bolstering as $t^* = \frac{1-\tau P_0}{1+\tau}$. The optimal bolstered power will be $P = \frac{1+P_0}{1+\tau}$. Optimal bolstering falls with τ. **QED**

Proof of Proposition 4:

For low power when power is shunned:

$$E(\pi) = \gamma e_1 + e_2 - [(\lambda e_1 + e_2)w(s)]$$

$Max\ E(\pi)$ subject to $(IC - no\ PM)$

Internalizing the IC-no PM constraints we get,

$$E(\pi) = \gamma\lambda w(s) + \frac{w(s)}{\tau} - \lambda^2 w(s)^2 - \frac{w(s)^2}{\tau}$$

Setting $\frac{\partial E(\pi)}{\partial w(s)} = 0$ we get $w(s) = \frac{\gamma\lambda\tau+1}{2(\lambda^2\tau+1)}$.

So optimal $E^{no-PM}(\pi) = \frac{(\gamma\lambda\tau+1)^2}{4\tau(\lambda^2\tau+1)}$.

When power is maintained the Participation Constraint will bind,

$$E(U) = (\lambda e_1 + e_2)w(s) - \frac{1}{2}e_1^2 - \frac{\tau}{2}e_2^2 = 0$$

Internalizing the IC-PM constraints we get

$$\lambda^2 w(s)^2 + 2\theta w(s) - \tau\theta^2 = 0$$

Solving the above we get, $w(s) = \frac{\theta}{\lambda^2}\left[\sqrt{1+\lambda^2\tau} - 1\right]$

If $\theta = \frac{1}{\tau}$ we get $w(s) = \frac{1}{\lambda^2\tau}\left[\sqrt{1+\lambda^2\tau} - 1\right]$

Thus, $E^{PM}(\pi) = \frac{\gamma}{\lambda\tau}\left[\sqrt{1+\lambda^2\tau} - 1\right] + \frac{1}{\tau} - \frac{1}{\lambda^2\tau^2}\left[\sqrt{1+\lambda^2\tau} - 1\right]\left[\sqrt{1+\lambda^2\tau}\right]$

If $\theta = P$, $w = \frac{P}{\lambda^2}\left[\sqrt{1+\lambda^2\tau} - 1\right]$

$$E^{PM}(\pi) = \frac{\gamma P}{\lambda}\left[\sqrt{1+\lambda^2\tau}-1\right] - \frac{P^2}{\lambda^2}\left[\sqrt{1+\lambda^2\tau}-1\right] + P - \frac{P^2}{\lambda^2}\left[\sqrt{1+\lambda^2\tau}-1\right]^2$$

Now, $E^{PM}(\pi) \geq E^{no-PM}(\pi)$

$$\Leftrightarrow \frac{\gamma P}{\lambda}\left[\sqrt{1+\lambda^2\tau}-1\right] - \frac{P^2}{\lambda^2}\left[\sqrt{1+\lambda^2\tau}-1\right] + P - \frac{P^2}{\lambda^2}\left[\sqrt{1+\lambda^2\tau}-1\right]^2 \geq \frac{(\gamma\lambda\tau+1)^2}{4\tau(\lambda^2\tau+1)}$$

$$\Leftrightarrow \frac{P^2}{\lambda^2}\left[\sqrt{1+\lambda^2\tau}-1\right]\left[\sqrt{1+\lambda^2\tau}\right] - \left[\frac{\gamma}{\lambda}\left[\sqrt{1+\lambda^2\tau}-1\right]+1\right]P + \frac{(\gamma\lambda\tau+1)^2}{4\tau(\lambda^2\tau+1)} \leq 0$$

Setting the LHS equal to zero we get the roots of P as

$$P = \frac{\left[\frac{\gamma}{\lambda}\left[\sqrt{1+\lambda^2\tau}-1\right]+1\right] \pm \sqrt{\left[\frac{\gamma}{\lambda}\left[\sqrt{1+\lambda^2\tau}-1\right]+1\right]^2 - \frac{\left[\sqrt{1+\lambda^2\tau}-1\right](\gamma\lambda\tau+1)^2}{\lambda^2\tau\sqrt{1+\lambda^2\tau}}}}{\frac{2}{\lambda^2}\left[\sqrt{1+\lambda^2\tau}-1\right]\left[\sqrt{1+\lambda^2\tau}\right]}$$

It can be shown that,

$$\frac{\left[\frac{\gamma}{\lambda}\left[\sqrt{1+\lambda^2\tau}-1\right]+1\right] + \sqrt{\left[\frac{\gamma}{\lambda}\left[\sqrt{1+\lambda^2\tau}-1\right]+1\right]^2 - \frac{\left[\sqrt{1+\lambda^2\tau}-1\right](\gamma\lambda\tau+1)^2}{\lambda^2\tau\sqrt{1+\lambda^2\tau}}}}{\frac{2}{\lambda^2}\left[\sqrt{1+\lambda^2\tau}-1\right]\left[\sqrt{1+\lambda^2\tau}\right]} > \frac{1}{\tau}$$

And therefore the lower root will be the relevant one which is given below:

$$P = \frac{\left[\frac{\gamma}{\lambda}\left[\sqrt{1+\lambda^2\tau}-1\right]+1\right] - \sqrt{\left[\frac{\gamma}{\lambda}\left[\sqrt{1+\lambda^2\tau}-1\right]+1\right]^2 - \frac{\left[\sqrt{1+\lambda^2\tau}-1\right](\gamma\lambda\tau+1)^2}{\lambda^2\tau\sqrt{1+\lambda^2\tau}}}}{\frac{2}{\lambda^2}\left[\sqrt{1+\lambda^2\tau}-1\right]\left[\sqrt{1+\lambda^2\tau}\right]} = \hat{P}$$

Therefore for $\hat{P} \leq P < \frac{1}{\tau}$, $\theta = P$ and $w(s) = \frac{P}{\lambda^2}\left[\sqrt{1+\lambda^2\tau}-1\right]$.

When power is maintained, the political worker gets her outside option 0. But when power is shunned the worker gets $E(U) = \frac{(\gamma\lambda\tau+1)^2}{8\tau(\lambda^2\tau+1)} > 0$ and the participation constraint does not bind.

For $0 < P < \hat{P}$, we get $w(s) = \frac{\gamma\lambda\tau+1}{2(\lambda^2\tau+1)}$ and power is shunned. **QED**

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