# Incentive Contracts for Politicians and the Down-Up Problem

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**Abstract**

Many efficient policies imply a temporary deterioration of GDP while the benefits accrue to voters later. Such policies have a down-up characteristic. We show that voters cannot motivate politicians to invest in down-up policies by their reelection decision. The incumbent either undertakes short-term policies or sticks with the status quo. We show that adding a further incentive element to the reelection mechanism can solve the investment problem of down-up policies. For instance, if a politician wants to stand for reelection, he must accept that his future income or his future reelection possibilities are dependent on macroeconomic developments. Finally, we comment on practical issues when a hierarchy of incentive contracts and elections are used in politics.

Keywords: Incentive contracts, politicians, down-up policies, reelection mechanism.

JEL Classification: D72, D82

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# 1 Introduction

Many efficient policies require a temporary deterioration of welfare while the benefits accrue to voters later. Such policies have a down-up characteristic. Consider the pressing issue of unemployment in Europe. Reforming the labor market is generally considered inevitable in order to cure unemployment. However, introducing labor market reforms may cause disruptions and even higher unemployment first because some layoffs immediately occur while the creation of new jobs may take time.

In this paper we examine how politicians can be motivated to undertake policies with such a down-up feature. Our major result is that politicians aiming at being reelected must adopt an incentive contract that makes their income or a further reelection contingent on future macroeconomic performance such as GDP or unemployment.

We consider a model where an elected politician faces the following options. First, he can undertake a socially desirable down-up policy, i.e. the expected long-term benefits outweigh the temporary downturn in GDP. Second, he can adopt a short-term policy which increases welfare temporarily, but has negative future benefits. The short-term policy has lower expected welfare than the long-term policy. Third, he can choose to do nothing and continue with the status quo. The politician derives some private returns if projects yield social returns above the status quo. The overall utility of the politician increases with the probability of being reelected as well as with the expected private net returns from his policy decisions.

Voters cannot verify exactly which type of policy has been undertaken. Voters can, however, observe the developments of GDP or welfare and try to infer the type of policies from those data. Since voters cannot immediately distinguish between a down-up policy, a short-term policy or the status quo, they face a serious inference problem at the reelection stage. If they observe an economic downturn, they do not know whether this has been caused because the politician has done nothing or because he has invested into the future by adopting a down-up policy.

The voters cannot provide appropriate incentives by reelection decisions to motivate politicians to implement down-up policies. If they constantly reelect a new policy maker, the incentive for the incumbent to undertake short-term policies are high because he will not be reelected anyway and he derives private benefits from the short-term policy. If voters automatically reelect the incumbent, he has no incentive for down-up policies as well be-

cause he gets reelected anyway and he again can derive private benefits from short-term policies without negative consequences. If voters reelect incumbents only if the performance in the past period is sufficiently high, politicians will undertake short-term policies because such policies increase welfare in the election period with certainty. If voters reelect incumbents only if the performance is equal to the status quo, politicians will stick to the status quo because this ensures reelection. In any case, voters cannot provide appropriate incentives for politicians to undertake socially optimal down-up policies by their reelection decisions.

In this paper we suggest that appropriate incentive contracts can motivate politicians who seek reelection to undertake socially desirable down-up policies. If a politician wants to stand for reelection, he must be willing to accept that his future income is dependent on macroeconomic variables. Or he must accept that he cannot stand for reelection if the macroeconomic performance is too poor in the next term. The latter contract implies that term limits must be conditioned on macroeconomic performance. The terms and quantitative measures of the incentive contracts can be proposed by the incumbent itself.

While there appears to be no specific literature on incentive contracts for politicians, there is a rapidly growing literature on incentive contracts for central bankers. The government can impose a penalty if it can verify that the central bank did not try to meet its target levels. For a discussion of the enforcement of such arrangements and the nature of penalties see Rogoff (1985), Garfinkel and Oh (1993), Persson and Tabellini (1993), and Walsh (1995a, 1995b). For instance, Walsh (1995b) shows how the threat of dismissal can cause the central banker to follow a desired policy. In this paper, we discuss how incentive elements can help to motivate politicians to invest in long-term projects. Incentive contracts for politicians need to be combined with the democratic requirement of periodic reelections. In this paper we propose a hierarchy of incentive contracts and periodic reelection as a solution to the democratic dilemma that politicians may have insufficient incentives to undertake socially efficient policies.

The paper is organized as follows: In the next section, we outline the model and assumptions. In section 3, we consider the possibilities and limitations of the reelection mechanism to achieve optimal decisions. In section 4, we show that appropriate incentive contracts can yield socially optimal decisions. In section 5, we discuss some practical problems associated with incentive contracts for politicians.

# 2 Model and Assumptions

We analyze a dynamic game of incomplete information. There are two periods. For simplicity, we assume that the politician (or agent) whose decisions we are analyzing is risk neutral. The costs and benefits of a policy are measured in dollars. The game is given as follows:

Period 1: The agent must decide whether to undertake certain projects. He has three options. He can undertake a short-term policy $(STP)$ which generates a positive return $V_S^1 > 0$ in this period, but a negative return $V_S^2 < 0$ next period. The second option is a long-term policy $(LTP)$. The long-term policy has uncertain short-term consequences $V_L^{1i}$ with $i$ either High (H) or Low (L). We assume that $V_L^{1H} = V_S^1$ and $V_L^{1L} = 0$. The latter is simply a normalization. $LTP$ generates positive payoffs $V_L^2 > 0$ in the next period. The a priori probability for value $V_L^{1i}$ is $\pi_i$. The last option for the policy maker is to continue with the status quo and to do nothing $(NOT)$. Payoffs in this case in both periods are $V_N^1 = 0$ and $V_N^2 = 0$, respectively.

The agent decides among his options $\{STP, LTP, NOT\}$. The public observes the realizations of returns. The public's belief that the agent has undertaken the $LPT$ is denoted by $g_1$; with probability $1 - g_1$ it thinks he is either opted for $STP$ or $NOT$.

Period 2: The public decides on the reelection of the politician. If the agent gets reelected, he realizes the returns initiated by his decisions last period. If a new politician has been selected, he will realize the consequences initiated by his predecessor.

The assumption $V_L^{1H} = V_S^1$ implies that voters cannot distinguish between $LTP$ and $STP$ at the reelection stage. The assumption $V_L^{1L} = 0$ makes it impossible for voters to separate $LTP$ from the status quo $NOT$. The agent's utility increases in private returns from projects as well as in the chances to stay in office in the next period which, in turn, depends on the public's assessment whether the agent has undertaken $LTP$. We asssume that a politician can generate private returns if he realizes social returns about the status quo and as long as he is in power. The social returns from the status quo have been normalized to zero. If he is in power and realizes a social project return $V$ in a particular period, we assume that his private benefits are given by:

$$\alpha \max[V, 0] \tag{1}$$

where $\alpha$ is some number $0 < \alpha < 1$. The above assumption is justified by the observation that high returns enable the agent to channel some returns to interest groups that support him. The assumption appears to be more restrictive than needed. Any discrepancy between welfare and private returns, e.g. differences in the discount rates, or different policy preferences will generate the same inefficiency issues discussed in this paper.

We concentrate on the agent's utility in period 1 when he stands for reelection. Utility increases with the probability that the public reelects the agent as well as with the present value of the expected private net returns from his policy decisions over. Expected private returns from policies over both periods are denoted by $R$. The probability that the agent is reelected is denoted by $p$ $(0 \leq p \leq 1)$. $p$ represents the strategy space of the public. We assume that utility is given by

$$U = mR + (1-m)p. \tag{2}$$

The parameter $m$, with $0 < m < 1$, is the weight the agent assigns to private returns compared to the weight he assigns to the chances of being reelected. A weight $m$ close to 1 means that the agent is mainly motivated by the policies he implements. A low value of $m$ corresponds to an agent mainly concerned about winning elections.
We denote the expected returns from the options $STP, LTP$ and $NOT$ by $EV_S, EV_L$, and $EV_N$, respectively. Thus:

$$\begin{aligned} EV_S &= V_S^1 + \delta V_S^2 \\ EV_L &= \pi_H V_L^{1H} + (1-\pi_H) V_L^{1L} + \delta V_L^2 = \pi_H V_S^1 + \delta V_L^2 \\ EV_N &= V_N^1 + \delta V_N^2 = 0 \end{aligned}$$

$\delta$ is the discount factor $(0 < \delta \leq 1)$. We assume that

$$EV_L > EV_N > EV_S$$
$$V_S^1 > EV_L$$

The preceding assumption immediately leads to the socially optimal solution when the public could directly enforce the optimal policy on the politician. The socially optimal policy is $LTP$. If the public cannot observe the actual decisions of politicians, it has

to infer the policies from the realization of the returns in this period. However, since $V_L^{1H} = V_S^1$ and $V_L^{1L} = V_N^1 = 0$, such inference is limited, because $LTP$ and $STP$ as well as $STP$ and $NOT$ cannot be distinguished.

# 3 Fixed and Conditional Reelection Probabilities

In this section, we consider how the reelection mechanism works in the presence of down-up policies. In order to give the reelection mechanism the best chanceto motivate a politician to undertake socially beneficial long-term projects, we assume that voters can commit to a particular reelection strategy at the beginning of the election. As we will see, no matter how reelection is arranged, the politician will never choose $LTP$. The result will be reinforced in a more realistic scenario where voters cannot commit to a particular reelection strategy at the beginning of a term.

We first ask whether a fixed reelection probability can induce the politician to invest in $LTP$. As the following proposition demonstrates, the answer is no:

**Proposition 1**

*For any fixed* $p$ $(0 \leq p \leq 1)$*, the politician chooses* $STP$*.*

**Proof :**

The utility from $STP$ is given by

$$U(STP) = m\alpha V_S^1 + (1-m)p$$

If the politician selects $LTP$ he obtains

$$U(LTP) = m \cdot \left\{\alpha \pi_H V_S^1 + \alpha p \delta V_L^2\right\} + (1-m)\, p \leq m\alpha EV_L + (1-m)p$$

Hence for any $p$ $(0 \leq p \leq 1)$

$$U(STP) - U(LTP) \geq m\alpha(V_S^1 - EV_L) > 0$$

and the politician chooses $STP$.

■

The explanation for proposition 1 is straightforward. Since for any fixed reelection probability, private benefits are higher for $STP$, the politician will never opt for $LTP$. The

next question concerns the possibility of the public to condition reelection probabilities on the returns achieved in the first period. We denote by $p(V_S^1)$ and by $p(0)$ the reelection probabilities depending on the possible realizations of returns in the first period. We obtain:

**Proposition 2**

*Suppose that $m \leq m^*$. Then, there does not exist two probabilities $p(V_S^1)$ and $p(0)$, such that the agent chooses $LTP$.*

**Proof :**

Given any reelection probabilities, the politician expects the following utilities;

$$\begin{aligned} U(LTP) &= m \cdot \left\{ \pi_H \left( \alpha V_S^1 + p(V_S^1)\, \delta \alpha V_L^2 \right) + (1-\pi_H) \left( p(0)\, \delta \alpha V_L^2 \right) \right\} \\ &\quad + (1-m) \cdot \left\{ \pi_H\, p\,(V_S^1) + (1-\pi_H)\, p(0) \right\} \\ U(STP) &= m \cdot \left\{ \alpha V_S^1 \right\} + (1-m)\, p(V_S^1) \\ U(NOT) &= (1-m) p(0) \end{aligned}$$

$U(LTP) > U(STP)$ requires that $p(0) > p(V_S^1)$ because otherwise

$$U(LTP) \leq m \left\{ \alpha \pi_H V_S^1 + \delta \alpha\, p(V_S^1) V_L^2 \right\} + (1-m)\, p(V_S^1) < U(STP)$$

If $p(0) > p(V_S^1)$, the politician chooses $LTP$ instead of $NOT$ if and only if

$$\begin{aligned} & m \cdot \left\{ \pi_H \left( \alpha V_S^1 + p(V_S^1)\, \delta \alpha V_L^2 \right) + (1-\pi_H) \left( p\,(0)\, \delta \alpha V_L^2 \right) \right\} \\ & + (1-m) \cdot \left\{ \pi_H \left( p\,(V_S^1) - p(0) \right) \right\} \geq 0 \end{aligned}$$

The left side is monotonically increasing in $m$. For $m = 0$, the left side is negative. For $m = 1$, it is positive. Hence, by the mean value theorem there exists $m^*$ such that the agent chooses $LTP$ if and only if $m \leq m^*$.

■

Proposition 2 shows that if a politician is sufficiently interested in reelection, no arrangements of reelection probabilities can induce him to choose $LTP$. Witha high reelection probability $p(0)$, the politician will tend to choose $NOT$. If the public reelects candidates with $p\,(V_s^1) > p(0)$, $STP$ yields higher utility for the agent than $LTP$. Hence, the public faces the dilemma that no matter how reelection probabilities are arranged, the politician either chooses $STP$ and $NOT$. Hence, the reelection mechanism does not provide sufficient incentives for a politician to undertake socially efficient long-term policies as long

as the policy maker himself is sufficiently interested in reelection. It is obvious that the same result occurs when voters cannot commit to particular reelection probabilities at the beginning of the term. In the case of non-commitment, the set of conditional reelection probabilities that voters find optimal at the reelection stage is either equal to or smaller than in the commitment case. Therefore, the result in proposition 2 can only be reinforced when voters cannot commit to particular reelection probabilities.

# 4 Incentive Contracts at the Reelection Stage

In this section, we consider an alternative possibility to induce the politician to choose the socially efficient policies. The idea is to supplement the reelection mechanism by an other incentive element. If a politician wants to be reelected, he must sign an incentive contract that makes his future utility dependent on the economic performance in the second term. A newly elected politician is, however, not allowed to enter an incentive contract with the public.

Therefore, if the politician wants to get reelected, he must accept the following contract $C(\beta V^2)$ where $\beta$ is a number $0 < \beta < 1$. If the social welfare in period 2 is realized as $V^2$, the politician obtains a net transfer $\beta V^2$ if $V^2 > 0$ and must pay $-\beta V^2$ to the public if $V^2 < 0$. We obtain:

**Proposition 3**

*Suppose that a politician who runs for reelection must accept an incentive contract* $C(\beta^* V^2)$ *for some threshold level* $\beta^*$*. Then a unique subgame perfect equilibrium exists in which*

- *the politician chooses* $LTP$ *and accepts the incentive contract* $C(\beta^* V^2)$
- *the public reelects him according to*

$$p(V_S^1) = 1$$
$$p(0) = 1$$

**Proof :**

Because of $p(V_S^1) = p(0)$, the politician never chooses $NOT$. He chooses $LTP$ if and only if

$$U(LTP) = m \cdot \left\{ \alpha \pi_H V_S^1 + \delta \alpha V_L^2 + \delta \beta V_L^2 \right\} + (1-m)$$
$$> U(STP) = m \left\{ \alpha V_S^1 + \delta \beta V_S^2 \right\} + (1-m)$$

Since $V_L^2 > 0, V_S^2 < 0$, $U(LTP) - U(STP)$ is monotonically increasing in $\beta$. Moreover, for $\beta = \alpha$, we have $U(LTP) > U(STP)$ because of our assumption $EV_L > EV_S$. Hence, there exists a threshold level $\beta^*$ such that the politician chooses $LTP$, if $\beta \geq \beta^*$ and $p(V_S^1) = p(0) = 1$. If the politician chooses $LTP$, reelecting him is a best response for the public, since the public does not gain anything by electing a challenger. This completes the proof.

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The bottom line of proposition 3 is that incentive contracts at the reelection stage can provide sufficient incentives for politicians to undertake $LTP$ and allow the public to reelect the politician without causing policy distortions. The requirement to accept the incentive contract acts as an entry barrier to reelection. The entry barrier is low if the politician has undertaken beneficial long-term policies. The entry barrier is high and will deter a politician from seeking reelection if he has not invested in long-term policies.

# 5 Discussion and Extensions

In this paper, we have suggested a simple solution to the problem that a politician is not sufficiently motivated to undertake long-term beneficial policies for the public. While the suggested solution appears to be simple, there can be considerable practical problems in its implementation which we discuss in this section.

The first issue is on what quantitative measures the incentive contract should be based. In the case of European unemployment this is somewhat obvious, because the incentive contract can use the average unemployment rate[1] over the next term. However, politicians usually face a multi-task problem. Politicians in the executive and legislative branch should be concerned with many different issues. Whereas issues such as unemployment or criminal activities can be measured with sufficient precision, this is not the case for other issues such as reforming civil laws or changing the class size in schools. Therefore, a significant part of activities cannot be measured. As we know from the theory of multi-task incentive problems outlined in Holmström and Milgrom 1991[2] severe measurement constraints can make it impossible to use task specific performance schemes or aggregate performance measures. For instance, if politicians are only judged by the employment performance they may increase the size of the public sector to meet the required standard and they neglect other important issues.

The multi-tasking and measurement problem can be considerably alleviated by the hierarchical incentive mechanism suggested in this paper. A politician can only stand for reelection if he is willing to base his future income or future reelection on the performance in the most pressing issue, say unemployment. If he accepts the incentive component, he can stand for reelection and voters can judge his performance on the remaining issues. If he has only worked for lowering unemployment and accepts the incentive contract, voters may not reelect him because he has a bad record on other important issues. Therefore, the hierarchical incentive scheme can cause the politician to choose the socially desirable down-up policy without neglecting other issues.

A second practical issue is the selection of tasks, outcomes and standards in the incentive contract for the politician at the reelection stage. While it would be possible to determine the incentive contract by an outside agency, a more promising approach is to let the in-

1 There can be a definition problem, since the unemployment rate is defined in different ways. Hence, there is a need to agree upon a definition that cannot be changed anymore.

2 Moreover, Gersbach 1997 shows that in some cases controlling each task separately is not better than relying on the aggregate performance of the agent.

cumbent and his challenger to compete for suitable offers of incentive contracts. Then, the incumbent has an incentive to promise an appropriate scheme if he has undertaken long-term beneficial policies.

In the paper, we have discussed the value of ex post incentive contracts when politicians need to sign a contract at the end of their first term in order to get reelected. A complementary approach is the use of ex ante incentive contracts. Such contracts have to be signed at the beginning of the first term and state that the politician can only stand for reelection if the performance for certain tasks is above a certain threshold level. Such ex ante incentive contracts are well suited for multi-taks problems with noisy performance signals at the end of the first term. Such ex ante incentive contracts can help to solve pressing policy problems such as the European Unemployment problem (see e.g. Gersbach1999).

While there are a number of practical issues when a society wants to use additional incentive elements at the reelection stage, we think that well designed incentive elements could complement the reelection mechanism in motivating politicians to invest in socially desirable down-up policies. Pressing problems such as high unemployment in Europe may then have a better chance to be solved by regulatory reforms of labor and product markets initiated by politicians who want to get reelected.

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