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Hyperbolic Discounting and Politics: The beneficial effects of bureaucrats

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Abstract

This paper introduces hyperbolic discounting into politics. In our model, politicians act according to the preferences of voters in order to be re-elected. As voters' preferences are dynamically inconsistent, the political process results in an allocation of the public budget that is distorted towards consumption expenditures. We show that this inefficiency is mitigated when the influence of bureaucrats who favour an excessive supply of public goods is taken into account. Finally, we derive a positive relationship between the optimal level of a bureaucracy's influence and the relevance of long-term investments in a given policy area.

Keywords: Political Agency, Hyperbolic Discounting, Bureaucracy.

JEL Code: D 72, D 73, H 11.

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1 Introduction

Beginning with Barro (1973) and Ferejohn (1986) political agency models show that elections are an appropriate incentive device for disciplining the self-interest of politicians.[1] Moreover, there is an increasing number of empirical studies that provide evidence of the beneficial effects of elections.[2] On the other hand, political budget cycle models following Nordhaus (1975) argue that politics becomes short-sighted and populist whenever elections are pending. These negative consequences of elections are also supported empirically.[3] In spite of the outlined ambiguity in the literature, the precise conditions under which voters evaluate government programs correctly and the effect of the institutional setting on the extent of political short-sightedness is still under-researched.[4]

We propose hyperbolic discounting as an alternative rational for political short-sightedness. If voters' preferences are dynamically inconsistent and politicians tend to act according to will of the electorate in order to be re-elected, the political process results in an allocation of public funds which is distorted towards consumption expenditures. This idea can be captured in a simple framework which allows for the analysis of different institutional settings. We show that the presence of an independent bureaucracy might improve long-term welfare: As bureaucrats increase public expenditures excessively, they also raise the level of public investment which is beneficial if voters erroneously opt for too much consumption due to hyperbolic discounting.

In order derive our results, we extend the retrospective voting model of Persson and Tabellini (2000) by incorporating hyperbolic discounting on the side of voters (and the other political actors). Following the seminal work by Laibson (1997), numerous empirical studies have established evidence of dynamically inconsistent preferences.[5] In recent time, researchers began to transfer this idea to public economics.[6] Yet, hyperbolic discounting has so far still mainly been applied to individual choices like saving or consumption decisions, but been neglected in political economics. We start

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[1] For a recent survey see Besley (2006).

[2] See e.g. Besley, Persson and Sturm (2005) who confirm their hypothesis that elections reduce the influence of interest groups in an empirical study of the development of the U.S. South.

[3] For a recent cross-country analysis see e.g. Shi and Svensson (2006).

[4] One explanation are informational asymmetries between voters and politicians. Rogoff (1990) proposes an adverse selection model where the more talend politician distorts the budget. Shi and Svensson (2006) come up with a moral hazard model of electoral competition. Both approaches differ from our as they rely on hidden information as the only source of political short-sightedness.

[5] Most recent studies like Shapiro (2005) and Benhabib, Bisin and Schotter (2006) find significant evidence of dynamically inconsistent behaviour.

[6] See Bernheim and Rangel (2005) for a recent survey of that literature.

to scrutinize this new possibility by studying the effects of a systematic bias against future payoffs on political decisions.

In our model, the government can offer two distinct kinds of public goods, a short-term consumption good and a long-term investment good. Most importantly, citizens vote according to today's wishes and against their own long-term interests.[7] Hence, voters reward public investment expenditures at the polls less than they actually should do. This in turn gives the incumbent politician an incentive to shift expenditures towards current consumption in order to be reelected thereby choosing a suboptimal allocation of public funds. We show that this "populist" distortion, i.e. the distortion towards present consumption due to hyperbolic discounting, prevails even if the political process is perfectly transparent and politicians cannot appropriate any rents for themselves. In contrast, the "imperfect agency" distortion, i.e. the rents appropriated by the incumbent politician, disappears completely when transparency becomes perfect.[8]

After showing that hyperbolic discounting on the side of voters might result in distorted policy outcomes, we analyze how the extent of political short-sightedness is shaped by the institutional setting.[9] We thereby focus on non-elected political institutions and bureaucracies in particular. More precisely, we think of top bureaucrats in ministries and at other government agencies who have a considerable influence on political decisions due to their special knowledge of 'their' policy area.[10] The self-interest of these bureaucrats is summarized in a bias for high government expenditures as proposed by Niskanen (1971) in our model.[11] Note that these special interests of bureaucrats are - in contrast to those of politicians - not curbed by electoral constraints as bureaucrats are often appointed for a long time. Consequently, bureaucrats are less sensitive to citizens' preferences as correctly criticized by Public Choice scholars.[12] In our setting, however, this deviation from the will of the electorate is not welfare-decreasing in general, but may entail a welfare-improving flip-side: If bureaucrats increase public expenditures excessively, they also raise the level of public investment which is beneficial if political competition is stiff and voters opt for short-term benefits. A priori it is

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[7]Similarly, O'Donoghue and Rabin (2003) argue that people may consume too much of certain unhealthy items, such as fatty food, even though realizing this failure.

[8]Empirically, it has been shown that more fiscal transparency reduces rents (e.g. Alt and Lassen, 2006) and that elections affect the composition of public expenditures (e.g. Shi and Svensson, 2006).

[9]Our results regarding non-elected institutions require a political distortion towards short-term expenditures and do not rely depend on hyperbolic discounting specifically.

[10]Though politicians have the legal right to take policy decisions, bureaucrats elaborate drafts and finally implement policies.

[11]For a summary of the empirical evidence see Mueller (2003).

[12]See e.g. Rowley and Elgin (1988).

not clear whether this beneficial effect dominates the detrimental overall expenditure increase caused by bureaucrats. However, it can be shown that starting from a situation where politicians have full control, a small increase of the bureaucrats' influence increases voters' welfare. This result is based on a typical second best argument: The increase of public consumption is a second order loss, whereas the increase of public investment is a first order gain. The positive welfare effect occurs even though bureaucrats do not possess any better information and equally suffer from hyperbolic discounting as voters and politicians do.

Finally, we take into account that the relative importance of consumption and investment expenditures differs across policy areas. Capturing this idea, we derive a positive relationship between the importance of investment expenditures and the optimal level of influence of bureaucracies.[13] This analysis contributes to the discussion of whether political agents should rather be appointed or elected. Alesina and Tabellini (2006b), for example, study this question in a career concern model with multiple tasks and come to the analog conclusion that bureaucrats are better if short-termism is prevalent. In contrast to their work, our paper mainly focuses on the joint effect of the interaction between bureaucrats and politicians.[14]

The empirical literature on the effects of bureaucracies is consistent with our central hypothesis. Rauch (1995) shows that the establishment of professional bureaucracies instead of politically appointed ones was crucial for growth when analyzing municipal reforms in US cities at the beginning of the 20th century. He argues that professional bureaucracies increased the time horizon of public decision makers. In a subsequent investigation Evans and Rauch (1999) specify the key institutional characteristics of the successful 'Weberian' bureaucracy like meritocratic recruitment through competitive examinations, civil service procedures for hiring and firing rather than political appointments and dismissals, and filling higher levels of the hierarchy through internal promotion. Our model offers a way to reconcile Rauch's empirical results with Niskanen's view of budget-expanding bureaucrats. A certain level of bureaucratic influence generates Rauch's results, whereas an excessive influence confirms Niskanen's hypothesis.

Our result that the influence of bureaucracies might be welfare increasing stands in contrast to the classical literature following Niskanen (1971) which generally evaluated

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[13]Practically, the level of independence could be adjusted by varying the degree of independence granted to bureaucrats.

[14]Besley and Coate (2003) argue that elected regulators are more pro-consumer as elections allow to unbundel policy issues. Alesina and Tabellini (2006a) conclude that bureaucrats are preferable to politicians in technical tasks for which ability is more important than effort.

expenditure increases as detrimental. One exemplary application of this negative view of bureaucracies can be found in Fuest (2000). When considering the welfare effects of tax competition, Edwards and Keen (1996) emphasized the need to evaluate both the economic distortions caused by tax competition and existing political distortions. Fuest (2000) provides an extension where politicians only have limited control over fiscal policy and have to bargain with bureaucrats about the budget. In his framework welfare unambiguously declines as bureaucrats gain bargaining power. This analysis, however, only focuses on the absolute level of public expenditures and offers no differentiated examination of public expenditures.

The paper is organized as follows: Section 2 presents a basic model of politicians under electoral constraints. Section 3 discusses the incentives which bureaucrats face and incorporated bureaucrats into the decision-making process. The welfare implications of our model are analyzed in section 5. In section 6 we extend the model by deriving policy specific optimal levels of bureaucratic influence. Section 7 concludes with an outlook on possible future research.

2 A basic voting model with hyperbolic discounting

We start with introducing hyperbolic discounting into the retrospective voting framework presented by Persson and Tabellini (2000). In our specification voters have dynamically inconsistent preferences and underestimate the value of public investments. As elections create sharp incentives, politicians converge to policies which reflect the incorrectly perceived interests of voters. Hence, politics becomes short-sighted.

The timing of our model is the following: In period one an incumbent politician is already in office. First, voters set a reservation utility level as the minimum requirement for reelecting the incumbent. Then the politician in office decides on the provision of public goods and the level of rents. At the end of period one elections are held. If the incumbent is reelected, he remains in office for another term. If the incumbent is not reelected, he is replaced by another politician.

We consider only one representative citizen in order to focus on distortions caused by hyperbolic discounting and abstract from distributional conflicts among the electorate.[15] To capture the idea that individuals suffer from self-control problems, we

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[15]Distributional conflicts among the electorate may also be responsible for policy distortions. Rodrik and Fernandez (1991), for example, show that uncertainty regading the individual benefits from policy reforms suffices to distort public policy choices.

need to distinguish carefully between the voter's ex-post utility U (1) representing his long-term utility and the voter's ex-ante utility $\widetilde{U}$ (3) which is his instantaneous utility in period one.

The representative voter's ex post utility U is given by

$$U(G, I, r) = Y - T + H(G) + F(I) \tag{1}$$

Here Y is an exogenous income and T a lump-sum tax which finances public expenditures. In order to differentiate between long-term and short-term expenditures, we assume that the government provides two different kinds of public goods. First, a public consumption G which increases the welfare of voters immediately. The public investment good I on the other hand does not become effective until period two, but promises a positive rate of return that more than compensates citizens for waiting until the second period.[16] The voter's utility from both kinds of public goods, $H(G)$ and $F(I)$, is increasing and strictly concave, i.e. $H' > 0, H'' < 0$ and $F' > 0, F'' < 0$ respectively.[17] Moreover, we assume that $F'(0) > 1$ in order to guarantee that it is always beneficial for the voter if at least one marginal unit of his income is spent on public investments. For simplicity, we do not allow for private saving possibilities, i.e. the returns to public investments are the only source of income in period two. The future utility from these investments $F(I)$ is discounted by a standard discount rate which is normalized to one throughout our analysis. The per-unit costs of both G and I are set equal to unity. Correspondingly, the budget constraint of the government including the incumbent politician's rent r, that is derived below, is given by:

$$T = G + I + r \tag{2}$$

The representative voter's ex ante utility $\widetilde{U}$ can be written as

$$\widetilde{U}(G, I, r) = Y - T + H(G) + \theta F(I) \tag{3}$$

The crucial difference between U and $\widetilde{U}$ is the reduced valuation of next period's utility expressed by $\theta < 1$, although the standard discount rate is normalized to unity.[18] Intuitively, the voter neglects the advantages of investments partly as these only become

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[16]Empiricially, the distinction between public consumption and investment expenditures is blurred. We understand G as the sum of all public expenditures that become effective in the short term.

[17]In order to restrict the analysis to interior solutions we assume further that $H'(0) \geq 1, H'(Y) < 1, F'(0) \geq 1, F'(Y) < 1$.

[18]We adapt the general case of dynamically-inconsistent preferences to our two-period-model. For the general case see Laibson (1997).

apparent in period two. Hence, his election decision is based on the ex-ante utility $\widetilde{U}$. In contrast, optimal behavior which maximizes long-run well-being takes U as benchmark.

The government decides on the allocation of tax revenues. It consists of a single politician in our framework. Furthermore, any selection issues are excluded as all politicians, the incumbent and his competitors, are identical. Therefore, voters can only discipline politicians by threatening not to reelect them again. In total, an incumbent politician's objective function is given by:

$$P = \gamma r + p_I(r)\theta R \tag{4}$$

Politicians are interested in political rents net of transaction costs γr and an ego rent R for holding office next period. The rents r are directly taken out of the government budget and represent wasteful government expenditures that entail no value for citizens like excessive pension payments. The transaction cost associated with extracting rents is denoted by γ, where $0 \leq \gamma \leq 1$. The lower γ, the more transparent are political procedures, i.e. the more costly it is for the incumbent to extract rents for private purposes. The level of rents r chosen by the incumbent determines his reelection probability p_I. The more rents are extracted, the less likely is reelection. The only motif for being reelected is the ego rent R from holding office in the second period. As an internal reward, the ego rent is unaffected by the transparency of the political process and exogenous in our two-period model. Moreover, we assume that all actors including the politicians have dynamically inconsistent preferences and discount future rewards with $\theta < 1$.[19]

The representative voter can discipline the incumbent politician by threatening not to reelect him if his utility falls below a certain reservation utility $\overline{U}$. If instead the voters' reservation utility is reached, the incumbent is reelected with certainty.[20] Thus, the reelection probability is

$$p_I = \begin{cases} 1 \; if \; \widetilde{U}(G, I, r) \geq \overline{U} \\ 0 \; otherwise \end{cases} \tag{5}$$

Given the voter's strategy, the incumbent has two options. Either he pleases the voter and provides the required utility level. This allows only for the extraction of moderate rents, but secures the ego rent R. Alternatively, he can abstain from being reelected

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[19]Note that it does not affect the results qualitatively whether bureaucrats and politicians are hyperbolic discounters as well.

[20]By restricting the analysis to one representative voter, it is implicitly assumed that voters are able to coordinate on an optimal voting strategy.

and take maximum rents today which are limited by the total income Y.

When setting the optimal reservation utility $\overline{U}^*$, the voter regards his perceived utility $\widetilde{U}$ as objective. Correspondingly, the maximum perceived welfare the politician can generate is $\widetilde{U}^*$ (by providing $\widetilde{G}^*$ and $\widetilde{I}^*$). As the voter receives $U = 0$ if the incumbent accepts not being reelected, it is always worthwhile to implement some level of public good provision. Hence, the voter will assure that the incumbent is better of with moderate current rents plus the continuation value of future rents than with exploiting his discretion. The related participation constraint of the incumbent can be written as

$$\gamma r + \theta R \geq \gamma Y \tag{6}$$

This participation constraint forces the voter to concede a rent $r^* = Y - \frac{\theta R}{\gamma}$ which is just enough to make the incumbent indifferent between being re-elected and leaving office. The equilibrium rent r^* depends on the value of future terms in office R and the costs of extracting rents γ. If the transparency of the political process γ increases, the rent r^* shrinks and approaches $r^* = 0$ for $\gamma \to 0$.[21]

In sum, the optimal reservation utility $\overline{U}^*$ is given by:

$$\overline{U}^* = Y - r^* - \widetilde{G}^* - \widetilde{I}^* + H(\widetilde{G}^*) + \theta F(\widetilde{I}^*) < \widetilde{U}^* \tag{7}$$

Maximizing his objective function (4) given the voters' reservation utility (7), the politician provides public goods such that the following first-order conditions are fulfilled:[22]

$$H'(G) = 1 \tag{8}$$

$$F'(I) = \frac{1}{\theta} \tag{9}$$

This means that the politician provides both public goods in the amount that pleases the voter most and seizes a net-rent γr^* such that the voter's reservation utility $\overline{U}^*$ is just reached. Hence, he is reelected and receives the ego rent R as well. We sum up our results in

Proposition 1 *The equilibrium of the retrospective voting model with hyperbolic discounting agents is characterized by a public good provision that is best from the ex ante perspective of voters. This implies that the level of public consumption is efficient, but the level of public investment inefficiently low when applying voter's ex post utility*

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[21]Attention is restricted to the cases where $r \geq 0$.

[22]We assume that the budget constraint is never binding.

as the relevant utility measure. The incumbent politician is re-elected and receives a net-rent γr^* and the ego rent R.

This equilibrium entails two inefficiencies:[23] On the one hand there are positive rents r^* for politicians. This "imperfect agency" distortion can be alleviated by increasing the transparency of the political process: If γ goes to zero, this distortion even disappears completely. The second inefficiency, however, consists in a distorted allocation of the budget. The insufficiently low level of public investment is due to the dynamic inconsistency of voters' preferences. If the political process is made more transparent, this "populist" distortion is not mitigated.

3   Incorporating a bureaucracy

To assess whether the influence of bureaucrats mitigates the problem of underinvestment in the framework outlined above, we first consider the incentives bureaucrats face. According to Niskanen (1971) bureaucrats are mainly interested in the size of their budget as this is positively correlated to privileges like power. Moreover, bureaucrats are (at least not immediately) responsible to the electorate.[24] We start from this account, but emphasize that bureaucrats face 'soft' responsibility constraints and need to preserve a certain level of public support to be protected against unpleasant interventions by politicians. This restriction prevents bureaucrats from increasing I and G infinitely. Therefore, we write the bureaucrat's objective function as[25]

$$B = V(G, I) - C(G, I) \tag{10}$$

The gain of influence associated with the size of the budget $V(G, I)$ follows the reasoning that bureaucrats strive to maximize an objective function which depends positively on the size of the budget of their agency like

$$V(G, I) = (1 - \beta)(G + I) \tag{11}$$

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[23]Due to quasi-linear structure of the voters' utility function in our model, these two issues can be separated neatly.

[24]In the long run, i.e. after two periods, voters know whether public investments have been successful. As long as the performance of bureaucrats is not evaluated until the second period, voters' short-sightedness is not adopted by bureaucrats.

[25]Note that our results are not sensitive to the specific construction of the bureaucrat's objective function, but only require that they tend to increase public expenditures, however not ad infinitum.

Here $\beta \in [0,1]$ is a constant factor representing the benefits associated with high budgets and necessary for making both components of the bureaucrat's objective comparable. The lower is β, the more is the bureaucrat of a Niskanen-type and the more important is budget size to him.

Though bureaucrats do not face any sharp reelection constraints, their privileges considerably depend on the standing of their agency.[26] Accordingly, we assume that the costs of excessively increasing an agency's budget $C(G,I)$ rise with the difference between $\widetilde{U^*}$ and the actually provided utility level:

$$C(G,I) = \widetilde{U}^* - \widetilde{U}(G,I) \tag{12}$$

Put simply, a bureaucrat faces a trade-off when increasing public expenditures beyond the levels considered optimally by voters. Thus, the bureaucrat increases public expenditures such that the marginal gain of influence derived from a higher budget exactly equals the marginal loss of influence associated with the declining public support when public goods are oversupplied.

Based on the above analysis, we now look at a setting where bureaucrats are able to influence policy decisions due to their informational advantage. This interaction between politicians and bureaucrats is modelled as a Nash-bargaining game where the latter have a small, but not negligible influence.

To demonstrate Proposition 2 we set-up the following Nash-Maximand:

$$\Omega = \alpha \log(P - P_0) + (1 - \alpha) \log(B - B_0)$$

where α represents the influence of the politician.

The corresponding first order conditions are given by:

$$\frac{\partial \Omega}{\partial G} : \alpha \frac{1}{P - P_0}(-1 + H'(G)) + (1 - \alpha)\frac{1}{B - B_0}(-\beta + H'(G)) = 0 \tag{13}$$

$$\frac{\partial \Omega}{\partial I} : \alpha \frac{1}{P - P_0}(-1 + \theta F'(I)) + (1 - \alpha)\frac{1}{B - B_0}(-\beta + \theta F'(I)) = 0 \tag{14}$$

We first consider the extreme cases. If $\alpha = 1$ the politician has all bargaining power and the result is the same as in the basic model without bureaucrats. Correspondingly, the public consumption good G is provided efficiently. However, the level of I provided is inefficiently low as voters do not value investments sufficiently. In the case of $\alpha = 0$

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[26]For example, an agency that spends too much faces a higher risk of restructuring.

the bureaucrat has full bargaining power. Then the first order conditions become:

$$H'(G) = \beta \tag{15}$$

$$F'(I) = \frac{\beta}{\theta} \tag{16}$$

In that case the public consumption good G is provided excessively as long as $\beta < 1$, i.e. as along as bureaucrats have a slight direct interest in public expenditures. The provision of the public investment good is always higher than in the case where the politician decides alone and only excessive if the expenditure bias dominates the distortion from hyperbolic discounting, i.e. if $\beta < \theta$. In the case of $\alpha = 1$, the politician provides the efficient amount of the consumption good G, but undersupplies the investment good I as known from (8) and (9). For the intermediate cases with $0 < \alpha < 1$ the precise outcome, G_{NB}^* and I_{NB}^*, depends on the weight α and the outside positions $P - P_0$ and $B - B_0$ respectively. Independent of the exact bargaining power of the two parties it is always the case that the public consumption good is excessively provided for $\beta < 1$ and that the public investment good is delivered in an amount which is higher than in the case where the politician decides alone.

If voters know that politicians depend on bureaucrats when providing public goods, they will take this additional restriction into account when setting their reservation utility for reelecting the incumbent. In fact, they acknowledge that a certain reduction in their utility is due to a bureaucracy that cannot (at least not in the short-term) be influenced by politicians. Hence, they concede the government to provide a lower utility level $\overline{U}_B^*$ than in the case when politicians alone determine public policy:

$$\overline{U}_B^* = Y - r^* - \widetilde{G}_{NB}^* - \widetilde{I}_{NB}^* + H(\widetilde{G}_{NB}^*) + \theta F(\widetilde{I}_{NB}^*) < \overline{U} < \widetilde{U}^* \tag{17}$$

where $\widetilde{G}_{NB}^* > \widetilde{G}^*$ and $\widetilde{I}_{NB}^* > \widetilde{I}^*$.

Comparing (8) and (9) with (15) and (16) yields

Proposition 2 *When the influence of bureaucrats is taken into account, the public consumption good G is provided excessively as long as $\beta < 1$. The provision of the public investment good I is always higher than in the case where the politician decides alone and excessive if $\beta < \theta$.*

4 Welfare Analysis

When bureaucrats influence policy decisions, voters' ex ante utility definitely shrinks. Yet, it might well be that due to the increase in public investments voters' ex post utility rises. In the following we prove this hypothesis and argue that a (limited) influence of bureaucrats is welfare-increasing. In doing so, we build on the assumption that time-inconsistent preferences need to be regarded as a real distortion transmitted by the political process. However, one could also regard today's utility as the relevant welfare measure. Accordingly, a low level of public investments is socially optimal and requires no further consideration. This argument has especially been put forward by Gul and Pesendorfer (2002) who do not regard reneging on one's own promises as a dynamic inconsistency, but as a change in preferences. Yet, we repudiate this latter view in line with O'Donoghue and Rabin (2003) and consider ex post utility as the normatively relevant long-run well-being.[27] This reflects the evidence of costly and superfluous commitment devices like illiquid assets suggests that the relevant welfare measure is voters' 'ex post utility U.[28]

To asses the welfare implications of the influence of bureaucrats, we need to consider how voters' ex post utility U changes when the influence of bureaucrats increases slightly, i.e. if α decreases. Thereby we start from a situation where politicians take public policy decisions alone ($\alpha = 1$). As a consequence $G = \widetilde{G}^*$ and $I = \widetilde{I}^*$.

$$\frac{\partial U(\widetilde{G}^*, \widetilde{I}^*, r^*)}{\partial \alpha} = \underbrace{\frac{\partial U(\widetilde{G}^*, \widetilde{I}^*, r^*)}{\partial G}}_{(0)} \underbrace{\frac{\partial G}{\partial \alpha}}_{(-)} + \underbrace{\frac{\partial U(\widetilde{G}^*, \widetilde{I}^*, r^*)}{\partial I}}_{(+)} \underbrace{\frac{\partial I}{\partial \alpha}}_{(-)} + \underbrace{\frac{\partial U(\widetilde{G}^*, \widetilde{I}^*, r^*)}{\partial r}}_{(-)} \underbrace{\frac{\partial r}{\partial \alpha}}_{(0)} \quad (18)$$

Equation (18) shows that the overall effect of a change in the bargaining power of the bureaucrat depends on two issues: Firstly, its effect on public goods provision and, secondly, the effect of the change of public goods provision on welfare. We can state

Proposition 3 *Starting from $\alpha = 1$, a marginal rise in the bureaucrat's bargaining power increases the provision of both public goods G and I. As the welfare effect of the increase in G does not matter at the margin and the welfare effect of the increase in I is positive, voters' overall welfare must rise. Proof see Appendix.*

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[27] According to O'Donoghue and Rabin (2003, p.3) hyperbolic discounting "[...] reflects a short-term desire or propensity that the person disapproves of at every moment in her life. Our welfare analysis [...] treats this preference for immediate gratification as an error." Equally, Laibson (1998) uses hyperbolic model to justify national saving plans.

[28] See Strotz (1956) for additional examples like Christmas Clubs which are hard to justify if individuals are perfectly rational.

The idea behind this reasoning is a typical second best argument: the increase of public consumption is a second order loss, whereas the increase of public investment is a first order gain. Given that one distortion already exists - in our case the underinvestment of politicians in face of elections - it is welfare enhancing to introduce a second distortion - the expenditure bias of bureaucrats - to mitigate the original distortion. As public consumption is provided optimally when the politician alone determines policies, a marginal increase in its provision has no first-order welfare effects. Yet, the marginal increase in public investment is a first-order gain as public investment is underprovided in the beginning.

5 Extensions

So far we have only considered the case where public consumption and public investment were equally relevant, yet the relevance of long-term investments differs empirically across policy areas. To capture this feature, we introduce weights for the different kinds of public goods in the following. In doing so, we show that the optimal level of bureaucrat's influence depends on the relative importance of consumption and investment in a given policy area. Intuitively, the level of influence is mainly determined by the degree of independence of a bureaucracy. To derive our result, we first prove that an optimal level of independence exists.

Evidently, the benefit of an increase in investments due to the bureaucrats' influence is less important the higher the level of investment already is. At the same time, the costs of excessively supplying public consumption increase with the level of public consumption. Consequently, there is a point where the benefits and costs of the bureaucrat's influence just cancel out. This optimal level of bureaucracy is determined by the maximization of voters' actual utility with respect to α, i.e.

$$\max_{\alpha} U = Y - G(\alpha) - I(\alpha) - r + H(G(\alpha)) + F(I(\alpha)) \tag{19}$$

The corresponding first-order-condition is given by

$$(H'(G) - 1)\frac{\partial G}{\partial \alpha} + (F'(I) - 1)\frac{\partial I}{\partial \alpha} = 0 \tag{20}$$

Proposition 4 *A socially optimal level of the bureaucrats' influence α^* exists and is characterized by* (20). *Proof see Appendix.*

In order to capture the idea that the importance of long-term investments differs across policy areas, we introduce a weight $\tau \in (0, 1)$ that represents the relative importance of investment expenditures. Correspondingly, $(1 - \tau)$ describes the relative importance of consumption expenditures. Then the area specific optimal level of bureaucracy can be characterized by the following first-order-condition

$$(1 - \tau)\left(H'(G) - 1\right)\frac{\partial G}{\partial \alpha} + \tau\left(F'(I) - 1\right)\frac{\partial I}{\partial \alpha} = 0 \qquad (21)$$

When investments are important, $(F'(I) - 1)\frac{\partial I}{\partial \alpha}$ is weighted with $\tau > 0.5$. and $(H'(G) - 1)$ with $(1 - \tau) < 0.5$. This implies that the investment part of the distortion, that is alleviated by the bureaucrat, becomes more relevant. At the same time, the consumption part of the distortion, that is aggravated by the bureaucrat, becomes less relevant. As a consequence, the optimal level of influence of bureaucrats is an increasing function of the sector specific importance of public investment. Moreover, our result implies that - if the influence of bureaucrats is optimally assigned across sectors - the supply of public consumption goods is especially excessive in sectors with an emphasis on long-term expenditures.[29]

Our result crucially depends on the partial independence of bureaucrats from politics, especially from the government. In contrast to that, bureaucrats which are "political" depend to a large extend on the success of the government that appointed them. This in turn changes their incentives dramatically: it effectively aligns the interests of bureaucrats with those of the government. In that case, the beneficial long-term effect of the expenditure bias is lost. Hence, our analysis also provides a rational for why civil service procedures are often constitutionally secured. If the government could freely choose to appoint a "career bureaucrat" or a "political bureaucrat", it would opt for a "political bureaucrat" as this increases short-term expenditures thereby improving the government's chances to stay in power. This finding is in line with the recommendations of Evans and Rauch (1999) who highlight the importance of meritocratic recruitment through competitive examinations and civil service procedures for hiring and firing.

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[29]The level of both public goods will be higher in policy areas where investments are crucial.

6 Conclusion

This paper starts from the observation that public budgets in many countries are biased towards consumption expenditures. We set up a model in which this feature results from strict electoral competition when voter have hyperbolic preferences. Under these circumstances, the same electoral constraints that discipline politicians on the one hand, induce them to allocate too many resources to present consumption and too little to public investment as voters undervalue public investments. Bureaucrats, however, are not directly responsible to voters, but appointed for lifetime. The corresponding insensitivity regarding the interests of voters induces an increase of public expenditures. Consequently, a bargaining game between politicians and bureaucrats leads to a beneficial mix of distortions where the political bias towards present expenditures is mitigated by the expenditure bias of bureaucrats.

We conclude that the independence of bureaucracies from political competition does not always need to be detrimental - even though it gives rise to an expenditure bias. Given that elections tend to make politics short-sighted, an independent bureaucracy might even be welfare enhancing. In other words, bureaucrats' limited necessity of being responsible to the electorate does not only have a negative impact on their performance and the size of the public budget as in our model. It also creates a long-term perspective which might be highly valuable in an environment of fierce political competition. This finding demonstrates that the welfare effects of institutions like the bureaucracy need to be considered in the broader context of public decision-making, i.e. in the context of the interaction between different political agents.

The above model can be extended to a multi-period model where a new type of political business cycle could be derived. If some investments yield a return during the period in which the elected government is in power, we would expect that the bias towards present consumption increases as the election date is approached. This implication could be tested empirically. Moreover, it could be asked how agencies can ever become independent. Therefore, a constitutional stage where voters decide on whether to establish a (partly) independent bureaucracy needs to be taken into account. If voters are aware of their self-control problems and if they have rational expectations about their future behavior, i.e. if voters are so-called sophisticated hyperbolic discounters (Laibson, 1997), they might opt for making bureaucracies (partly) independent using them as a device to commit themselves to support public investment in the future.

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7 Appendix

Proof of Proposition 3

As $\frac{\partial U(\widetilde{G}^*,\widetilde{I}^*)}{\partial \alpha}$ is evaluated at $\alpha = 1$, we know that $\frac{\partial U(\widetilde{G}^*,\widetilde{I}^*)}{\partial G} = -1 + H'(\widetilde{G}^*) = 0$. Correspondingly, $\frac{\partial U(\widetilde{G}^*,\widetilde{I}^*)}{\partial I} = -1 + F'(\widetilde{I}^*) > 0$ as $-1 + \theta F'(\widetilde{I}^*) = 0$ and $\theta < 1$.

As mentioned before, $\frac{\partial r}{\partial \alpha} = 0$.

The effects of changing the bargaining power α is determined as follows:

Differentiating the first-order condition (13) of the bargaining game with respect to α and G and rearranging terms yields:

$$\frac{\partial G}{\partial \alpha} = -\frac{\frac{1}{P-P_0}\left(H'(G)-1\right) - \frac{1}{B-B_0}\left(H'(G)-\beta\right)}{\left[\alpha\frac{(P-P_0)H''(G)-(H'(G)-1)^2}{(P-P_0)^2} + (1-\alpha)\frac{(B-B_0)H''(G)-(H'(G)-\beta)^2}{(B-B_0)^2}\right]}$$

At $\alpha = 1$, this expression reduces to

$$\frac{\partial G}{\partial \alpha} = \frac{\frac{P-P_0}{B-B_0}\left(H'(G)-\beta\right)}{H''(G)}$$

As $\beta \in [0,1]$ and $H'(G) = 1$ at $\alpha = 1$, $H'(G) - \beta > 0$. Moreover, $H''(G) < 0$ by assumption, hence we know that $\frac{\partial G}{\partial \alpha} < 0$.

Equally, we derive $\frac{\partial I}{\partial \alpha}$.

Differentiating the first-order condition (14) of the bargaining game with respect to α and I and rearranging terms yields:

$$\frac{\partial I}{\partial \alpha} = -\frac{\frac{1}{P-P_0}\left(\theta F'(I)-1\right) - \frac{1}{B-B_0}\left(\theta F'(I)-\beta\right)}{\left[\alpha\frac{(P-P_0)\theta F''(I)-(\theta F'(I)-1)^2}{(P-P_0)^2} + (1-\alpha)\frac{(B-B_0)\theta F''(I)-(\theta F'(I)-\beta)^2}{(B-B_0)^2}\right]}$$

At $\alpha = 1$, this expression reduces to

$$\frac{\partial I}{\partial \alpha} = \frac{\frac{P-P_0}{B-B_0}\left(\theta F'(I)-\beta\right)}{\theta F''(I)}$$

As $\beta \in [0,1]$ and $\theta F'(I) = 1$ at $\alpha = 1$, $\theta F'(I) - \beta > 0$. Moreover, $F''(I) < 0$ by assumption, hence we know that $\frac{\partial I}{\partial \alpha} < 0$.

$\frac{\partial G}{\partial \alpha} < 0$ and $\frac{\partial I}{\partial \alpha} < 0$ *imply that the provision of both kinds of public goods increases if the influence of the bureaucrat rises, i.e. if α falls. Hence,* $\frac{\partial U(\widetilde{G}^*, \widetilde{I}^*, r^*)}{\partial \alpha} < 0$ *at $\alpha = 1$ which implies that a slight increase of the bureaucrat's influence, i.e. a reduction of α, increases voters' welfare.*

Proof of Proposition 4

$H'(G)$ *and $F'(I)$ are monotonously decreasing in G and I by assumption. Moreover, we know that due to the set-up of the bargaining game G and I are monotonously decreasing in α. As shown in proof 1, the LHS of equation (20) is negative at $\alpha = 1$, i.e. $(H'(G) - 1) = 0$ and $(F'(I) - 1) > 0$. If α decreases, G as well as I increase since $\frac{\partial G}{\partial \alpha} < 0$ and $\frac{\partial I}{\partial \alpha} < 0$ (see A1 and A2). Correspondingly, the expression $(H'(G) - 1)$ becomes negative and the positive expression $(F'(I) - 1)$ smaller. As $\frac{\partial G}{\partial \alpha}$ and $\frac{\partial I}{\partial \alpha}$ are continuous in α and as the LHS of equation (20) is negative at $\alpha = 0$, a α^* such that (20) is fulfilled must exist. This α^* must be a unique maximum since starting from $\alpha = 1$ U increases when α falls as shown in the proof of proposition 3.*

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