E C O N O M I C S B U L L E T I N

When inertia generates political cycles: a remark

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Abstract

We show how introducing a time discount factor can strengthen some results given in [Soubeyran R. (2006) "When Inertia Generates Political Cycles," Economics Bulletin, Vol. 4 no. 31 pp. 1-8.].

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1 Introduction

In a recent article, [Soubeyran, 2006] showed that political cycles can occur when there is some inertia in the government policy. In this model lies an important and unsaid assumption: voters are myopic or have a null per period discount rate. In this remark, we show that, with three voters, there are cases where [Soubeyran, 2006]'s model shows no cycle whereas adding a non-null per period discount rate leads to some cycles. Then, when voters take the future into account, the possibility of seeing political cycles is greater. This strengthens the results obtained in [Soubeyran, 2006].

2 The model

We consider a society composed of three individuals, $\{L, R, m\}$. The reason why we consider only three individuals is explained in the end of the article. The set of policies is the interval $P = [-1, 1]$. Each individual $i \in N$ is represented by a bliss point α^i in the set of policies. For the sake of simplicity, we will set $\alpha^L = -1$ and $\alpha^R = 1$.[1] The society needs to choose a policy at each period of time between 1 and infinity. For this purpose, each individual i casts a vote $\omega^i\{L, R\}$ at each period between 1 and infinity. The policy implemented in $t = 0$ is exogenous and fixed to p_0. At each period of time, the candidate receiving the greatest number of votes, $W(t) \in \{L, R\}$ is elected. The elected individual in period t implements his favorite policy but because of some inertia between periods, the actual effective policy, p_t is given by

$$p_t = (1 - \delta)\alpha^{W(t)} + \delta p_{t-1},$$

where δ is the inertia parameter. If $\delta = 0$, there is no inertia and the effective policy is exactly the one implemented by the elected candidate. On the contrary, if $\delta = 1$, there is a full correlation between the policies and the elected candidate has no influence.

The utility of individual $i \in N$ in time T is given by

$$u_i(T, \{p_t\}_{t \in \mathbb{Z}^{++}}) = \sum_{t=T}^{t=\infty} -\beta^{T-t} \mid p_t - \alpha^i \mid,$$

where $\beta \in [0, 1]$ is the per period time discount rate.

[1] Notice that by imposing $\alpha^L = -1$ and $\alpha^R = 1$, we make sure that even in presence of inertia, candidates L and R will implement policies corresponding to their respective bliss points if elected. They have no mean to compensate for the inertia by behaving more extremist than they actually are. This possibility is not considered in [Soubeyran, 2006].

Finally, we will say that there are political cycles for the set of parameters $(\beta, \delta, p_0, \alpha^m)$ if and only if $W(t)$ does not converge when t goes to infinity.

Obviously, citizen-candidates L and R will always vote for themselves. Hence, citizen m will always be the median voter. Therefore, the following proposition given in [Soubeyran, 2006] can be stated in our framework.

Proposition 1
There are political cycles for the set of parameters $(\beta = 0, \delta, p_0, \alpha^m)$ if and only if $\frac{1-\delta}{1+\delta} \leq \frac{1-\alpha^m}{1+\alpha^m} \leq \frac{1+\delta}{1-\delta}$.

3 Results

When the problem is set with $\beta \neq 0$, we have a dynamical optimization problem. Then, we can set the value function giving the intertemporal utility of individual m as a function of the current policy p.

$$V(p) = - \mid p - \alpha^m \mid + \beta \max_{i \in \{-1;1\}} V(\delta p + i(1-\delta)). \tag{1}$$

This function is tricky to obtain analytically. We will rather computationally estimate it. We show in Figure 1 the value function $V(p)$ for $\delta = 0.5$, $\beta = 0.85$ and $\alpha^m = 0.6$.[2]

From the function $V(p)$ we can infer the votes of individual m. When $\beta = 0.85$ and $\alpha^m = 0.6$ (case shown in Figure 1), we can state that individual m votes for R when $p \leq 0.8933$ whereas he votes for L when $p \geq 0.8933$. Then, there is necessarily a political cycle for the set of parameters $(\beta = 0.85, \delta = 0.5, p_0, \alpha^m = 0.6)$ and any $p_0 \in P$. Notice that according to Proposition 1, there is no cycle for the set of parameters $(\beta = 0, \delta = 0.5, p_0, \alpha^m = 0.6)$ and any $p_0 \in P$. Then, the possibility of a cycle is introduced by considering a non-null time discount rate.

In figure 2, we show the votes at any policy p as a function of α^m for $\delta = 0.5$, $\beta = 0$ and $\beta = 0.85$. In all the cases we observed, the areas where individual m votes for R and L are compact. In these cases, obviously, there are no political cycles if and only if for any p, the vote is the same, R or L. For instance, when $\beta = 0.85$, there are political cycles if and only if $\alpha^m \in [-0.69, 0.69]$. When $\beta = 0$, there are political cycles if and only if $\alpha^m \in [-0.5, 0.5]$ as is shown by Figure 2 and as was stated by Proposition 1.

Then, in Figure 3, we can show the values of α^m as a function of β for which there are political cycles.

[2] See [Bertsekas, 1976, chap. 6] for the mathematical tools to estimate this function.

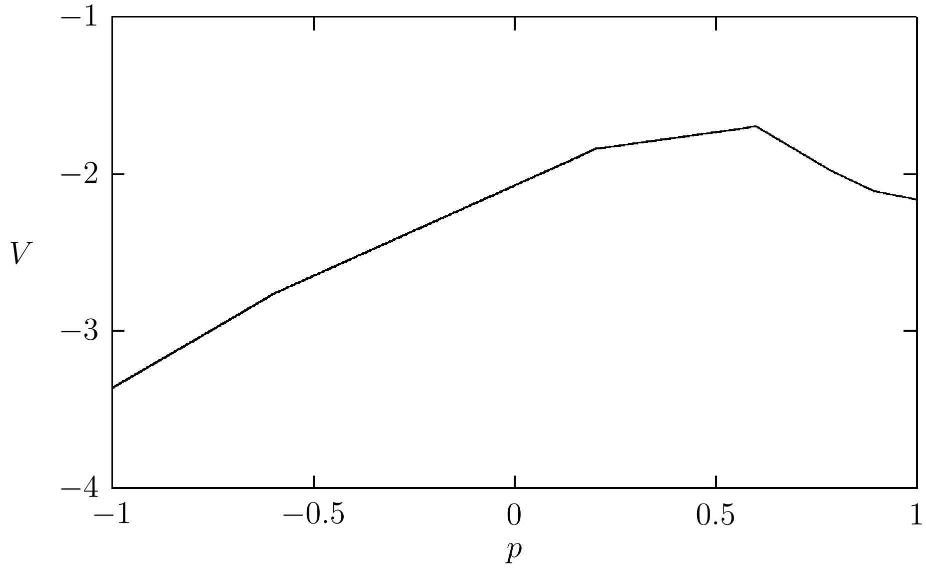

Figure 1: $V(p)$ with $\delta = 0.5$, $\beta = 0.85$ and $\alpha^m = 0.6$.

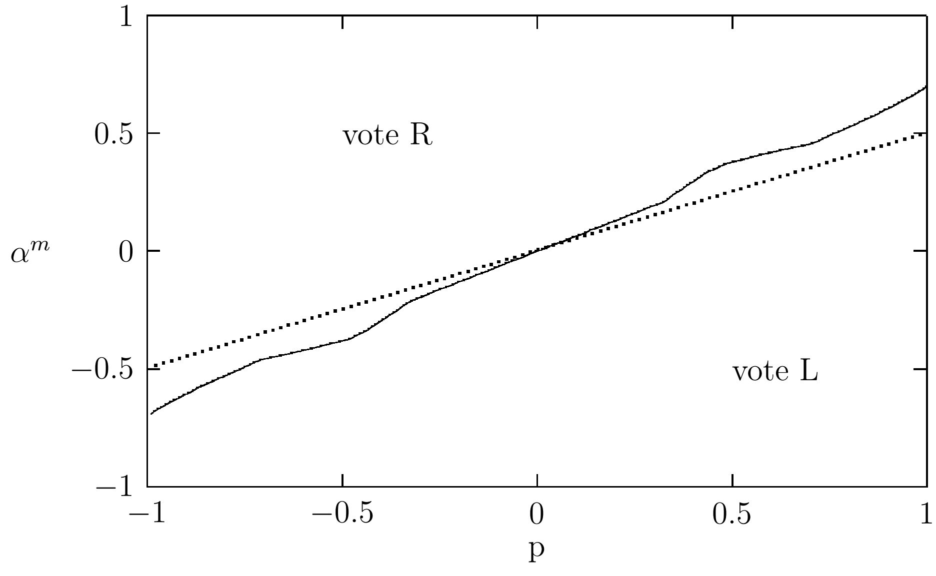

Figure 2: Votes at p as a function of α^m when $\delta = 0.5$ (both lines) and $\beta = 0.85$ (plain line) or $\beta = 0$ (dashed line).

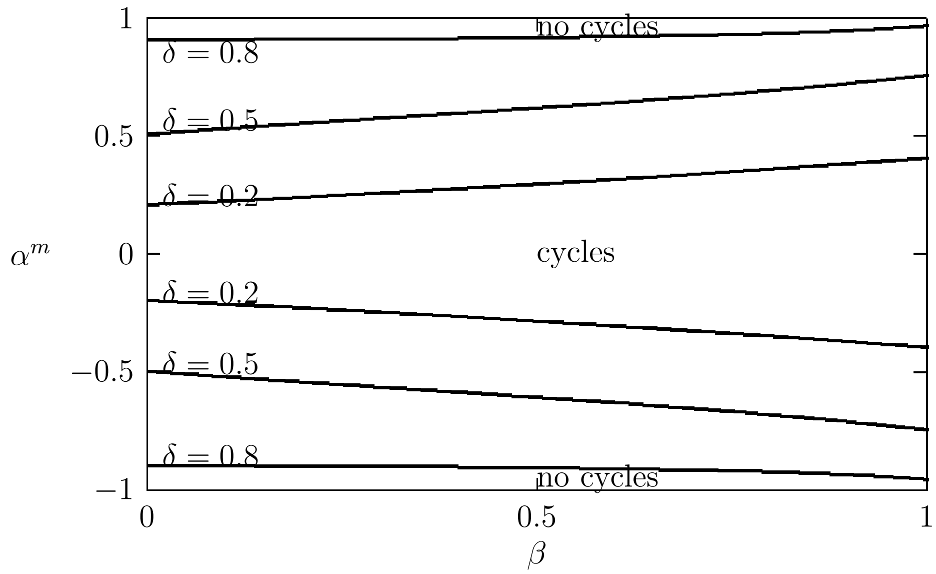

Figure 3: Political cycles as a function of α^m and β with $\delta \in \{0.2, 0.5, 0.8\}$.

4 Conclusion

Then, we showed that considering a non-null time discount rate strengthens the results obtained in [Soubeyran, 2006] in the sense that the set of cases where inertia leads to some cycles is greater when the time discount rate increases.

Finally, let us study one of our crucial assumptions. We imposed that the cardinality of the set of individuals be equal to three. Of course, if there are less than three individuals, the problem is degenerate. On the contrary, if there are more than three individuals, Equation 1 which is the basis of our study, is not the one describing how citizen would vote. This equation is satisfied with three individuals only because, since L and R always vote for themselves, individual m knows that he will always be the median voter. On the contrary, with more than three individuals, each of them should anticipate the path of votes in the future to know if they would vote for R or L. It is not clear if this would lead the social vote to be equal to the vote of the median voter. This is why, we restricted our study to the case with three individuals.

References

[Bertsekas, 1976] Bertsekas D.P. (1976) Dynamic Programming and Stochastic Control Academic Press, New York.

[Soubeyran, 2006] Soubeyran R. (2006) "When Inertia Generates Political Cycles," Economics Bulletin, Vol. 4 no. 31 pp. 1-8.