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## **When Inertia Generates Political Cycles**

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## **Summary**

We propose a simple infinite horizon of repeated elections with two candidates. Furthermore we suppose that the government policy presents some degree of inertia, i.e. a new government cannot completely change the policy implemented by the incumbent. When the policy inertia is strong enough, no party can win the election a consecutive infinite number of times.

**Keywords:** Political Cycles, Inertia

**JEL Classification:** D72, H7

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# When Inertia generates Political Cycles

Raphaël SOUBEYRAN \*

April 6, 2006

## Abstract

We propose a simple infinite horizon of repeated elections with two candidates. Furthermore we suppose that the government policy presents some degree of inertia, i.e. a new government cannot completely change the policy implemented by the incumbent. When the *policy inertia* is strong enough, no party can win the election a consecutive infinite number of times.

*Journal of Economics Literature Classification Numbers: D72, H7.*

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## 1 Introduction

In modern democracies, the alternation of political parties in power is a frequent phenomenon. Why isn't there a greater persistence of parties in power ? How can one explain the turnover of parties in government ? How can one explain political cycles ? In a dynamic setting, we introduce two imperfections to the model of Downs (1957). As other scholars (see Casamatta and De Donder (2005)), we consider a *programs inertia* assumption. As Heckelman (2000), we consider that parties have (different) fixed programs. The second, we call *policy inertia* represents imperfections in changing the government policy. This effect has various origins in real political life. Indeed, a majority of policies can not be changed without a cost. To modelize this stylized fact, we distinguish *effective policy*, which is the objective state of the policy, and the *government policy*, which is the policy of the incumbent during his legislature. We suppose that the effective policy at time  $t$  is a convex combination

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of the effective policy at date  $t - 1$  (past policy) and of the government policy at time  $t$ . This says that the government can not freely change completely the policy implemented in the past. We argue that is a reason why similar countries with different histories implement very different policies. We say that the model exhibits political cycles when no party can win the election a consecutive infinite number of times. That is parties indefinitely alternate (not necessary regularly) in power.

The main result states that if *policy inertia* is high enough, political cycles appear. Furthermore, we show that the dynamic can be history dependent. Indeed, if in an election, the median voter is indifferent between the two programs, the future dynamic will be dramatically affected. Scholars generally explain political cycles with psychological arguments (see Goertzel (2005) for a review of the American voters mood changes literature). Schlesinger (1949, 1986, 1992) consider that the electorate is inevitably disappointed by the party or the ideology that is in power. Klinberg (1952) suggests that American mood in public opinion balances between introversion and extroversion. This could explain why domestic and foreign concerns alternate through time and parties turnover in power. The main explanation is certainly disappointment. The “Negativity effect” theory (see Aragonés (1997) for a survey) is built on the following remark: voters’ decisions are based on the incumbent’s past performance and negative pieces of information have a greater impact than positive pieces of information. In the light of the negativity effect, Aragonés (1997) obtains a result of systematic alternation of the two parties implementing different policies. In our analysis, there is no uncertainty and electorate decisions are not based on past performance, but as usually in political models, for their preferred party at each election. We propose a simple model suggesting that political cycles can be generated by inertia only.

## 2 The model

**The constrained policy setting:** Two candidates  $R$  and  $L$  compete in an infinite horizon repeated elections setting. The set of policies is the interval  $P = [-1, 1]$ . Each citizen is represented by a bliss point  $\hat{\alpha}_i$  in the set of policies and voters bliss points are distributed over  $P$ . according to the cumulative distribution function  $F$ . The utility function of voter  $i$  is defined over the set of effective policies,  $U(\hat{\alpha}^i, p_t) = -|\hat{\alpha}^i - p_t|$  where  $p_t$  is the

effective policy at time  $t$ . We suppose that candidates programs are fixed. Candidate  $j$  proposes a policy  $z^j$ .

**Policy inertia:** We suppose that a policy implemented at date  $t$  has an influence on the effective policy at date  $t + 1$ . Let  $p_{t+1}$  be the effective policy at date  $t + 1$ . We suppose this policy results from the government policy at date  $t + 1$  and from the effective policy at date  $t$ . Let  $\delta \in [0, 1]$  be the "inertia" degree of past policies. Let  $z^{W(t+1)}$  denotes the program implemented in period  $t + 1$ . The effective policy at date  $t + 1$  is then:

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

In the case without policy inertia ( $\delta = 0$ ) there is no linkage between the successive elections. In the second polar case with full policy inertia ( $\delta = 1$ ), the policy is completely fixed and voting has no influence on the policy implemented. In the following, we will consider that  $\delta < 1$ . Between the two polar situations, a new government will have to face an inertia force  $\delta p_t$ , which can be interpreted in many ways.

Although the preferred effective policy of a voter is fixed, his preferred program changes from an election to the following. To illustrate the dynamic, let compute voter  $i$  preferred program (noted  $p_{t+1}^i$ ) at election  $t + 1$ :

$$p_{t+1}^i = \frac{\hat{\alpha}^i - \delta p_t}{1 - \delta},$$

Then, the more the effective policy of the previous period was leftist, the more the median voter will move to the right, and the more the effective policy of the previous period was rightist, the more the median will move to the left. This intuition underline the swing of the voters.

**Policy history:** We suppose that the first election take place in period 1, the influence of period 0 depend on a degree of inertia  $\delta_0$  not necessarily equal to  $\delta$  and a past policy  $p_0$ . These parameters can represent different histories. For example  $\delta_0 = 0$  could refer to a revolution preceding the first democratic election in  $t = 1$  and be interpreted as the fact that past policy is completely removed.

### 3 Political Cycles

We say that the set of parameters  $(\delta, \hat{\alpha}^m, z^L, z^R)$  exhibits *Political cycles* if no party can win the elections an infinite consecutive number of times, formally:

**Definition 1** A set of parameters  $(\delta, p_0, \hat{\alpha}^m, z^L, z^R) \in ]0, 1[ \times [0, 1]^3$  exhibits **Political cycles** if and only if  $W$  ( $W(t) \in \{L, R\}$ ) does not converge when  $t$  goes to infinity.

A first important remark, is that in situations where the median voter is indifferent between the two policies, the dynamic strongly depends on the randomized winner. Indeed, if the median voter is indifferent between the two parties in election  $t$ , he will not be indifferent in election  $t + 1$ . Let  $v_t^m$  be the utility of voter  $m$  over the set of programs at date  $t$ :

$$v_t^m(z) = u^i((1 - \delta)z + \delta p_{t-1}),$$

The following result is straightforward at the light of the previous remark.

**Lemma 2**  $z_{t+1}^m$  can not converge to  $\tilde{z}^m$  such that:  $\lim_{t \rightarrow +\infty} v_t^m(z^L) = \lim_{t \rightarrow +\infty} v_t^m(z^R)$ .

Hence, the situation where the median voter is indifferent between both parties cannot be stable in the long run. Now we characterize the set of parameters such that political cycles appear:

**Proposition 3** The set of parameters  $(\delta, p_0, \hat{\alpha}^m, z^L, z^R)$  exhibits Political cycles if and only if  $\frac{1-\delta}{1+\delta} \leq \frac{z^R - \hat{\alpha}^m}{\hat{\alpha}^m - z^L} \leq \frac{1+\delta}{1-\delta}$ ,  $W$  converge to  $L$  if and only if  $\frac{1+\delta}{1-\delta} < \frac{z^R - \hat{\alpha}^m}{\hat{\alpha}^m - z^L}$ , and  $W$  converge to  $R$  if and only if  $\frac{z^R - \hat{\alpha}^m}{\hat{\alpha}^m - z^L} < \frac{1-\delta}{1+\delta}$ .

**Proof.** Suppose  $\frac{1+\delta}{1-\delta} \geq \frac{z^R - \hat{\alpha}^m}{\hat{\alpha}^m - z^L} \geq \frac{1-\delta}{1+\delta}$ .

**step 1:** Suppose that  $W$  converge to  $L$ . Then, there exists an election  $k$  such that  $\forall t \geq k$ ,  $W(t) = L$ . This implies  $\forall t \geq k$ ,  $|p_{t+1}^m - z^L| \leq |z^R - p_{t+1}^m|$ . Furthermore,

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

Then,

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

Since  $\delta \in ]0, 1[$ ,  $\lim_{t \rightarrow +\infty} (p_{t+1} - z^L) = 0$ . Finally,  $\lim_{t \rightarrow +\infty} p_{t+1} = z^L$ . Now, we must have that the median voter (strictly, because of the Lemma) prefers  $L$  to  $R$ :

$$u^i(z^L) - u^i(z^R) = - \left| \frac{\hat{\alpha}^m - z^L}{1 - \delta} \right| + \left| z^R - \hat{\alpha}^m - \delta \frac{\hat{\alpha}^m - z^L}{1 - \delta} \right| > 0,$$

Which is equivalent to:

$$\frac{\hat{\alpha}^m - z^L}{1 - \delta} < z^R - \hat{\alpha}^m - \delta \frac{\hat{\alpha}^m - z^L}{1 - \delta} \text{ or } z^R - \hat{\alpha}^m - \delta \frac{\hat{\alpha}^m - z^L}{1 - \delta} < \frac{z^L - \hat{\alpha}^m}{1 - \delta},$$

Equivalent to:

$$\frac{1 + \delta}{1 - \delta} < \frac{z^R - \hat{\alpha}^m}{\hat{\alpha}^m - z^L},$$

Contradiction.

**step 2:** Suppose that  $W$  converge to  $R$ . Then, there exists an election  $k$  such that  $\forall t \geq k$ ,  $W(t) = R$ . This implies  $\forall t \geq k$ ,  $|z^R - p_{t+1}^m| \leq |p_{t+1}^m - z^L|$ . Furthermore,

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

Then,

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

Since  $\delta \in ]0, 1[$ ,  $\lim_{t \rightarrow +\infty} (p_{t+1} - z^R) = 0$ . Finally,  $\lim_{t \rightarrow +\infty} p_{t+1} = z^R$ . Now, we must have that the median voter prefers  $R$  to  $L$  (strictly, because of the Lemma).

$$u^i(z^R) - u^i(z^L) = - \left| \frac{z^R - \hat{\alpha}^m}{1 - \delta} \right| + \left| \hat{\alpha}^m - z^L - \delta \frac{z^R - \hat{\alpha}^m}{1 - \delta} \right| > 0,$$

Which is equivalent to:

$$\frac{z^R - \hat{\alpha}^m}{1 - \delta} < \hat{\alpha}^m - z^L - \delta \frac{z^R - \hat{\alpha}^m}{1 - \delta} \text{ or } \hat{\alpha}^m - z^L - \delta \frac{z^R - \hat{\alpha}^m}{1 - \delta} < \frac{\hat{\alpha}^m - z^R}{1 - \delta},$$

Equivalent to:

$$\frac{z^R - \hat{\alpha}^m}{\hat{\alpha}^m - z^L} < \frac{1 - \delta}{1 + \delta},$$

Contradiction.

Now, suppose  $\frac{1+\delta}{1-\delta} < \frac{z^R - \hat{\alpha}^m}{\hat{\alpha}^m - z^L}$ , this is equivalent to  $\hat{\alpha}^m < \frac{z^R(1-\delta) + z^L(1+\delta)}{2}$ . Furthermore,

$$p_t = (1 - \delta) \sum_{k=1}^t \delta^{t-k} z^{W(k)} + \delta^t p_0,$$

Then,

$$z_{t+1}^m \underset{t \rightarrow +\infty}{\sim} \frac{\hat{\alpha}^m}{1 - \delta} - \sum_{k=1}^t \delta^{t+1-k} z^{W(k)},$$



Thus,

$$z_{t+1}^m \underset{t \rightarrow +\infty}{<} \frac{z^R + z^L \frac{(1+\delta)}{1-\delta}}{2} - \sum_{k=1}^t \delta^{t+1-k} z^{W(k)} < \frac{z^R + z^L}{2},$$

Then  $W(t)$  converge to  $L$ .

Finally, suppose  $\frac{z^R - \hat{\alpha}^m}{\hat{\alpha}^m - z^L} < \frac{1-\delta}{1+\delta}$ , this is equivalent to  $\hat{\alpha}^m > \frac{z^R(1+\delta) + z^L(1-\delta)}{2}$ . Then,

$$z_{t+1}^m \underset{t \rightarrow +\infty}{>} \frac{z^R + z^L}{2} + \frac{\delta}{1-\delta} z^R - \sum_{k=1}^t \delta^{t+1-k} z^{W(k)},$$

Furthermore,  $\forall k, z^{W(k)} \leq z^R$ , then

$$\sum_{k=1}^t \delta^{t+1-k} z^{W(k)} \underset{t \rightarrow +\infty}{\leq} \frac{\delta}{1-\delta} z^R,$$

Thus,

$$p_{t+1}^m \underset{t \rightarrow +\infty}{>} \frac{z^R + z^L}{2},$$

Then  $W(t)$  converge to  $R$ . ■

Finally, when the policy inertia degree is high enough  $\left( \frac{|z^R + z^L - 2\hat{\alpha}^m|}{z^R - z^L} \leq \delta \right)$ , parties alternate in power. Indeed, if party  $L$  is the incumbent, he will necessary loose one future election. Then  $R$  wins the power and he will necessary loose one future election, and so on...

We have claimed that the dynamic can take two different paths when the median voter is indifferent between  $L$  and  $R$ . Indeed, suppose the median voter is indifferent in election  $t$ , formally,  $|p_t^m - z^L| = |p_t^m - z^R|$ . Since  $z^R \neq z^L$ , we have  $p_t^m = \frac{z^L + z^R}{2}$ . Now we compare the case where  $L$  wins the election to the case where  $R$  wins the election.

If  $L$  wins the election,  $p_t = \hat{\alpha}^m + (1-\delta) \frac{z^L - z^R}{2}$ . If  $R$  wins the election  $p_t = \hat{\alpha}^m + (1-\delta) \frac{z^R - z^L}{2}$ . Then the dynamic can change dramatically.

## 4 Conclusion

We have proposed a simple infinite horizon dynamic model of repeated elections where candidates have fixed programs and policies present some degree of inertia. We have shown that inertia can generate political cycles.

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