Economics of Politics
Lec. 5: Political Budget Cycle

Hideki Konishi

Graduate School of Economics, Waseda University

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Political budget cycles 1

1. Policies sometimes drastically change between terms before and after an election in spite of the same party or politician being in office. In particular, often pointed out is a phenomenon that the government budget will fluctuate between years before and after an election, which is called a *political budget cycle*.
2. Examples of a political budget cycle: expansionary fiscal policies such as tax reductions and spending increases are undertaken before elections, making budget deficits, but after elections austere fiscal policies such as tax increases and spending cuts are adopted to reduce budget deficits.
3. Why are expansionary fiscal policies chosen before elections?
4. Traditional explanation is that voters are myopic (*fiscal illusion*); they will vote without thinking that taxes will be increased after the elections.
5. Empirical results for this thought are mixed. Some argue that voters are *fiscal conservatives*, i.e., they will vote for governments who have reduced budget deficits (Peltzman (1992)).

Political budget cycles 2

1. Putting aside how fiscal policies fluctuate between periods before and after elections, won't political budget cycles occur at all if voters are rational?
2. Will political budget cycles occur when parties or politicians use budget policy as a signal of their types?
3. If they do in such a way, what implications do fiscal policies have when they serve as a signal?

A signaling model of political budget cycles

1. Two types of politician, H and L, irrespective of being the incumbent or a challenger. Type H is more collusive with special interest groups than type L, and thus has to pay a higher political cost for a spending cut.
2. Voters cannot know a politician's type from her appearance. They only know that a politician is type L with prior probability, $p \in (0, 1)$.
3. If the incumbent of type $t \in \{H, L\}$ cuts spendings by the amount of e such that $0 \leq e \leq \overline{e}$, she will obtain payoff, $R - \theta_t c(e)$, during office, where $R > 0$ is the ego rent and $\theta_t c(e)$ is the political cost of spending cuts with $\theta_H > \theta_L > 0$. $c(e)$ satisfies $c', c'' > 0$ and $c(0) = 0$.
4. Voters' payoff is $V_t + e$ when the incumbent is of type t and spendings are cut by the amount of e, where $V_L > V_H$. This inequality reflects the fact that type L favors the voters more even when both types choose the same amount of spending cuts.
5. We assume that voters' 1st-period payoffs $V_t + e$ will be realized at least after the election at the beginning of 2nd period. Otherwise, voters can identify the incumbent's type from the information of 1st period payoffs.

Timeline of the two-period game

1. Nature randomly chooses the type of the 1st period incumbent.
2. The 1st period incumbent chooses an amount of spending cuts, e_1, knowing her own type.
3. An election is held. Nature chooses the type of a challenger at random.
4. Voters decides whether candidate to vote for, after observing e_1.
5. The politician who won the election takes office in the 2nd period and cuts spending cuts by the amount of e_2.

Remarks

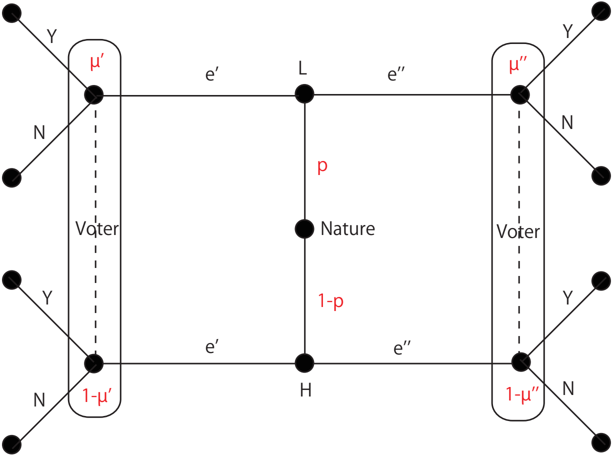
- Since no further election is being held in the 2nd period, both types of politician will choose $e_2 = 0$ in equilibrium.
- Thus, a candidate obtains a discounted payoff, δR, from winning the election at the beginning of the 2nd period , where $\delta \in (0, 1)$.

Perfect Bayesian Nash Equilibrium

1. Given $e_2 = 0$ for whichever type takes office in period 2, it is sequentially rational for voters to want to reelect the period-1 incumbent only if she is of type L.
2. Since voters can observe only e_1, they will infer the type of the incumbent from the information, the procedure of which is summarized by beliefs.
3. Taking this into account, a PBNE of the game is characterized as a combination of sequentially-rational strategies and consistent beliefs such that
   - beliefs, $\mu(L \mid e_1) : E \to [0, 1]$,
   - voters' strategy, $\phi(e_1) : E \to [0, 1]$, and
   - the period-1 incumbent's strategy, $e_1(t) : \{H, \ L\} \to E$,

   where $E = [0, \bar{e}]$.
   - We assume that $\bar{e}$ is large enough to not bind the equilibrium solution.
   - $\mu(L|e_1)$ denotes the probability of the incumbent's being type L when she implemented e_1.
   - $\phi(e_1)$ denotes the probability of reelecting the incumbent. This is also a *retrospective voting* strategy, though it is slightly different from what we learned in lecture 2.

Illustration of the game



Beliefs and voters' strategy

1. Since $e_2 = 0$ in equilibrium, voters' expected payoffs at the stage of election are

   $$\mu(L|e_1)V_L + [1 - \mu(L|e_1)]V_H$$

   if they vote for the incumbent and

   $$pV_L + (1 - p)V_H$$

   if they vote for the challenger.

2. Since voters want to elect only a politician of type L, given the beliefs, their sequential rational strategy is

   $$\phi(e_1) = \begin{cases} 1 & \text{if } \mu(L|e_1) > p \\ \phi_P & \text{if } \mu(L|e_1) = p \\ 0 & \text{otherwise.} \end{cases}$$

3. ϕ_P is an arbitrary number belonging to $[0, 1]$, because voters are indifferent between the incumbent and the challenger.

Beliefs and the incumbent's strategy

1. Consider two patterns of the incumbent's strategy. Let us denote $e_1(L) = e_L$ and $e_1(H) = e_H$ to save notations.
2. When it is separating, $e_L \neq e_H$. Consistency requires the beliefs to satisfy

   $$\mu(L|e_L) = 1 \text{ and } \mu(L|e_H) = 0.$$

   For $e_1 \neq e_L, e_H$, no restriction is placed on the beliefs.
3. When it is pooling, $e_L = e_H$ (which we will denote by e_P). Consistency requires the beliefs to satisfy

   $$\mu(L|e_P) = p.$$

   For $e_1 \neq e_P$, no restriction is placed on the beliefs.

Incentive compatibility condition

1. Given voters' strategy, the type-t incumbent's expected payoff is written as

$$\pi(e_1, t) = R - \theta_t c(e_1) + \phi(e_1)\delta R.$$

2. In PBNE, the incumbent's strategy, e_L and e_H, is sequential rational if and only if

$$\pi(e_L, L) \geq \pi(e_1, L) \text{ for all } e_1 \in E, \text{ and}$$

$$\pi(e_H, H) \geq \pi(e_1, H) \text{ for all } e_1 \in E,$$

which is often called *incentive compatibility (IC)* condition, saying that each type has no incentive to mimic the other type by manipulating strategies.

3. To solve PBNE, we have to characterize the set of equilibrium strategies together in combination with equilibrium beliefs.

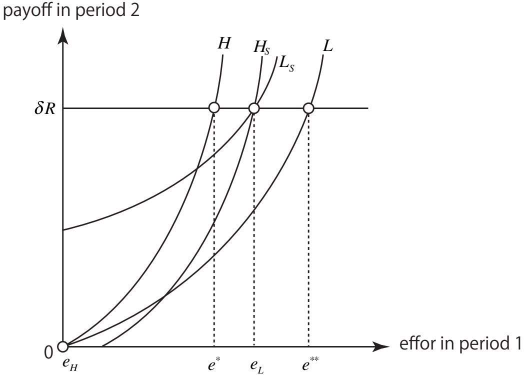
Looking for separating equilibria 1

1. In a separating equilibrium, $\phi(e_L) = 1$ and $\phi(e_H) = 0$, from which
$$e_H = 0$$
necessarily holds; otherwise, type H always gets better off by choosing $e_1 = 0$ (Note that this is a necessary condition).
2. To fully characterize the effort levels possibly chosen in separating equilibria, assume somewhat extreme beliefs,
$$\mu(L|e_1) = \begin{cases} 1 \text{ if } e_1 = e_L \\ 0 \text{ otherwise,} \end{cases}$$
under which the incumbent has to choose $e_1 = e_L$ for reelection.
3. In separating equilibria with the above beliefs, the IC conditions are reduced to
$$\pi(e_L, L) = R - \theta_L c(e_L) + \delta R \geq R - \theta_L c(e_H) = \pi(e_H, L)$$
and
$$\pi(e_L, H) = R - \theta_H c(e_L) + \delta R \leq R - \theta_H c(e_H) = \pi(e_H, H)$$
Combining these conditions yields
$$\theta_H[c(e_L) - c(e_H)] \geq \delta R \geq \theta_L[c(e_L) - c(e_H)]$$
which guarantees that only type L has an incentive to get reelected.

Looking for separating equilibria 2

1. From the above discussion, any e_L such that $\theta_H c(e_L) \geq \delta R \geq \theta_L c(e_L)$, which is reduced to $e^* \leq e_L \leq e^{**}$, can be achieve in a separating equilibrium.
2. The picture below depicts indifference curves of each type and shows their choices in the equilibrium.

[Figure 1: separating equilibrium]



Looking for separating equilibria 3

1. No e_L outside the range of $e^* \leq e_L \leq e^{**}$ can be achieved in a separating equilibrium. Type H is willing to choose $e_L < e^*$ and type L will not choose $e_L > e^{**}$.
2. We have a huge degree of freedom about the beliefs off the equilibrium path. For example,

$$\mu(L|e_1) = \begin{cases} 1 \text{ if } e_1 \geq e_L \\ 0 \text{ otherwise,} \end{cases}$$

   produces the same equilibrium outcome as above.
3. To sum up: there are infinitely many separating equilibria with type L choosing different effort levels. Even for each equilibrium effort level, there are infinitely many beliefs that are consistent with it, which we can refine by imposing some restrictions on beliefs (we will talk this issue later).

Looking for pooling equilibria

1. In a pooling equilibrium, $\phi(e_P) = \phi_P \in [0,1]$. IC condition is

$$\pi(e_P, L) = R - \theta_L c(e_P) + \phi_P \delta R \geq R - \theta_L c(e_1) + \phi(e_1)\delta R = \pi(e_1, L)$$

   and

$$\pi(e_P, H) = R - \theta_H c(e_P) + \phi_P \delta R \geq R - \theta_H c(e_1) + \phi(e_1)\delta R = \pi(e_1, H)$$

   for all $e_1 \in E$.

2. Given $\phi_P \in [0,1]$, e_P is realized in a pooling equilibrium if and only if

$$\phi_P \delta R - \theta_L c(e_P) \geq 0 \text{ and } \phi_P \delta R - \theta_H c(e_P) \geq 0,$$

   where the beliefs are constructed such that

$$\mu(e_1) = \begin{cases} p \text{ if } e_1 = e_P \\ 0 \text{ otherwise,} \end{cases}$$

   under which voters reelect the incumbent only if they observe e_P.

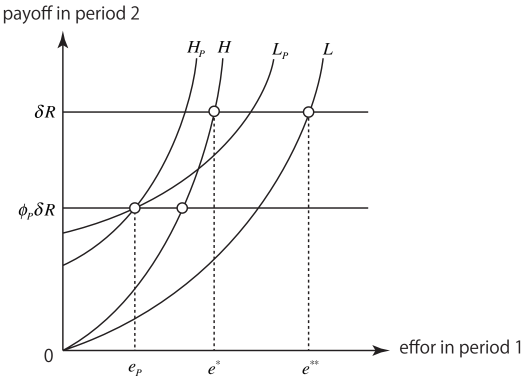
3. The inequality conditions are reduced into $\phi_P \delta R - \theta_H c(e_P) \geq 0$. With $\phi_P = 1$, we have the largest range of e_P as $0 \leq e_P \leq e^*$.

4. As in the case of separating equilibria, we have infinitely multiple equilibria with different levels of effort implemented.

Looking for pooling equilibria 2

- A pooling equilibrium is illustrated in the picture below.

[Figure 2: pooling equilibrium]



- As in separating equilibria, we have a huge degree of freedom in setting beliefs off the equilibrium path without changing the pooling outcome.

Summary and implications

1. Even with rational voters, politicians use budget policies as a signal to transmit private information to them and thus budget policies may fluctuate between periods before and after elections.
2. Specifically, in separating equilibria, $e_L > 0$ is chosen by type-L incumbents before elections and $e_2 = 0$ after they win elections, while in pooling equilibria, $e_P > 0$ is chosen before elections and $e_2 = 0$ after them by both types.
3. Budget signals provides voters with benefits of *selection* and *incentives*.
   - When separating equilibria occur, elections give incentives for type L incumbents to reduce wasteful spendings for reelection and enable voters to select a good candidate (type L), while no incentive is provided for type-H politician to reduce wasteful spendings.
   - When pooling equilibria occur, elections may give incentive for both types to reduce wasteful incentive if $e_P > 0$, but do not enable voters to distinguish the types of incumbent.
   - The amount of spending cuts realized in a separating equilibrium may be excessive and the one in a pooling equilibrium may be insufficient from the point of social welfare.
4. There remains multiplicity in the amounts of spending cuts realized, which we can refine with further restrictions on the out-of-equilibrium beliefs.

Refinement of separating equilibria 1

1. Apart from the belief formation, we have infinitely many separating outcomes for e_L. Every $e_L \in [e^*, e^{**}]$ can be one. Is it possible to reduce them?
2. To refine the equilibrium outcomes, we have to revise the beliefs off the equilibrium path. In the above discussion thus far, no restriction is placed on them. We need a reasonable restriction on them beyond Bayes rule.
3. The discussion goes as follows. Look at figure 1 again. To sustain the equilibrium choices, $\mu(L|e_1) = 0$ for and thus $\phi(e_1) = 0$ $e^* < e_1 < e_L$. The incumbent who has made such choices is believed to be type H for sure.
4. Does type H has an incentive to choose those effort levels at all? No, because even if they guarantee reelection, they yield lower payoffs than he obtains when choosing $e_H = 0$. In other words, $e_1 \in (e^*, e_L)$ is strictly dominated by $e_1 = 0$ for type H.

Refinement of separating equilibria 2

1. On the other hand, if choosing those effort levels guarantee reelection, type L has an incentive to do so, because they are not dominated. In fact, if one of them is the only effort level guaranteeing reelection and the others lead to sure defeat, type L will choose it.
2. In such a situation, it seems quite reasonable to believe that the incumbent who has chosen $e_1 \in (e^*, e_L)$ is type L for sure.
3. Following this argument, the beliefs must be changed to place $\mu(L|e_1) = 1$ on $e_1 \in (e^*, e_L)$.
4. However, as soon as the beliefs are accommodated this way, type L no longer has an incentive to keep choosing e_L. As a result, the original separating equilibrium breaks down.
5. Using this argument, almost all separating equilibria disappear. Only the one with $e_L = e^*$ can survive this *domination* test.

Refinement of pooling equilibria 1

1. Consider next refining the pooling equilibrium outcomes. As we can see in figure 2, there is no room for applying the domination test, because e_P is not dominated for either type. Both types willingly choose it when it is the only way to get reelected.
2. We need a new idea for refinement, called *equilibrium domination*, in which we will use the equilibrium payoffs as a reference level to find dominated actions.
3. Look at figure 2 and suppose that type H is choosing e_P in a pooling equilibrium.
4. Consider now whether type H has an incentive to choose e^* rather than e_P. The best thing that type H can expect from choosing e^* is to get reelected for sure. However, even if he anticipates it, he has no incentive to change his choice from e_P to e^*, as we can see from the location of his indifference curves.

Refinement of pooling equilibria 2

1. How about type L? If choosing e^* guarantees reelection with probability one, he is willing to change his choice from e_P to e^*, as we can see from the placement of his indifference curves.
2. Given these facts, how will the voters expect about the type of incumbent when they happen to observe that he has implemented effort level e^*? As compared to the equilibrium payoffs, type H must be worse off but type L can be better off.
3. It seems reasonable for the voters to conjecture that the incumbent is type L, because type L is the only one that has an incentive to do so.
4. If we follow this argument, the beliefs must hold $\mu(L|e^*) = 1$ and hence $\phi(e^*) = 1$. However, once the beliefs are changed this way, type L no longer has an incentive to choose e_P and will switch his choice to e^*. As a result, the pooling equilibrium disappear.
5. In fact, there is no pooling equilibrium that can survive this *equilibrium dominance* test (well known for *intuitive criterion*). For every possible e_P, we can find e^* like in figure 2 that makes only type L better off relative to the equilibrium payoffs, owing to the single-crossing property of the indifference curves.