Political Business Cycles: A Theoretical Appraisal

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Introduction

Do incumbent governments try to manipulate fiscal and monetary policy instruments so as to get re-elected and stay in office? Since the mid-seventies political economists have embarked in theoretical endeavours to address this question. They have tried to explain the interaction between political and macroeconomic variables in the election of new governments by looking at the dynamics between the electorate and the incumbent. This approach has two important features: (i) voters are assumed to maximise their individual utilities, and (ii) the incumbent is assumed to implement those policies that allow her to retain power. The incumbent stimulates the economy to acquire the maximum number of votes so as to get re-elected, and this stimulus in turn causes the economy to fluctuate around its long-run path. A Political Business Cycle (PBC) is therefore the economy's fluctuation around its long-run behaviour generated by the political system (Paldman 1997: 342). In other words, the PBC literature studies how interest groups and political pressures within a country influence its macroeconomic performance.

This field of study can be divided into two main waves of research: (i) the opportunistic models, and (ii) the partisan models. The first one, pioneered by Nordhaus (1975), identifies a cycle in the 'opportunistic' behaviour of politicians interested only in their re-appointment: the incumbent stimulates the economy before the election period so as to get re-elected. The partisan approach presented in the seminal work by Hibbs (1977) identifies a 'partisan' cycle in which different parties, when in office, implement different policies: the left-wing party tackles unemployment, and the right-wing party fights inflation.

These non-rational-expectations analytical frameworks were further developed during the mid-eighties to incorporate rational expectations. The works by Cukierman & Meltzer (1986), Rogoff (1990), and Persson & Tabellini (1990) include rational expectations into the 'opportunistic' framework first developed during the mid-seventies. Alesina (1987, 1988a, b) on the other hand builds a rational expectations model using a 'partisan' framework. The departure from the non-rational-expectations frameworks has two main implications: (i) voters can not be systematically fooled in equilibrium; that is, an incumbent's repeated 'opportunistic' behaviour is punished by the electorate, and (ii) economic activity is less influenced by economic policies in general (Alesina 1995: 146).

The purpose of this paper is to spell out the opportunistic and partisan models under the non-rational-expectations and rational-expectations framework and explain their intuition. The first part presents the non-

rational- and rational-expectations *opportunistic* models. The second part then delves into the non-rational and rational expectations *partisan* models. Finally, an overview is presented and future lines of research suggested.

1. The Opportunistic Political Business Cycle

Opportunistic models try to show that the incumbent government manipulates the economy using fiscal or monetary instruments just before the election period to maintain power. These models are usually represented by the candidates' objective function, by describing the economy through the well-known trade-off between inflation and unemployment (i.e. the Phillips curve), and how inflation expectations are formed. Two main lines of research have characterised these models: (i) the traditional (non-rational expectations) framework, and (ii) the rational expectations approach.

1.1 The Traditional Opportunistic Model

A formal theoretical opportunistic framework was pioneered by Nordhaus (1975). In his work the author tries to show that if voting is based on economic performance in the recent past and if inflation expectations were backward-looking, an opportunistic incumbent would find it optimal to generate a cycle corresponding to his term in office with an economic stimulus before elections and a recession afterwards. The analysis of the relation between inflation and unemployment surges from the conventional macroeconomic wisdom that there is a short-run trade-off between them, and the supporting evidence that voters are sensitive to both inflation and unemployment in their electoral choice. (Nordhaus 1975: 169)

The following assumptions underlie the Nordhaus' opportunistic model.

A 1.1.1 *The economy is described by an expectations-adjusted Phillips curve*

[1]: $y_t = \bar{y} + \gamma(\pi_t - \pi_t^e)$; (1.1.1)

where y_t is the rate of output growth, $\bar{y}$ is the natural rate of output, p_t is the inflation rate, π_t^e is the expected rate of inflation, and g is a positive parameter. Equation (1.1.1) simply says that policy-makers can "buy" output growth, y_t, by increasing the inflation rate, p_t, provided values of inflation expectations and the natural rate growth of output.

A 1.1.2 *Inflation expectations are adaptive.*

The traditional opportunistic model assumes that expected inflation is determined by past values of inflation:

$$\pi_t^e = \pi_{t-1} + \lambda(\pi_{t-1}^e - \pi_{t-1}) \; ; 0<\lambda<1 \qquad (1.1.2)$$

where λ captures today's reaction to past periods' mistakes in forecasting inflation. Small values of λ imply that expected inflation in period t are almost identical to past inflation regardless of past mistakes in forecasting; that is, the effect on expectations of the second term in equation (1.1.2) on the right-hand side is almost nil in this case.

Using equations (1.1.2) and (1.1.1) one gets the expectations-augmented Phillips curve under the adaptive expectations assumption:

$$y_t = \bar{y} + \gamma\left(\pi_t - (1-\lambda)\sum_{i=0}^{\infty}\lambda^i \pi_{t-1-i}\right) \qquad (1.1.3)$$

Equation (1.1.3) is one of the main features of the model which states that the policy-maker can achieve and maintain a desired level of output growth by choosing the appropriate level of inflation p_t.

A 1.1.3 *Politicians are identical and they prefer to stay in office.*

This assumption entails that the incumbent and the challenger are rational individuals who only seek to maximise their probability of re-election. He defines this aggregate measure simply as the sum of all voters preferences since these are assumed to be identical. Provided that the incumbent knows the electorate's preferences, and that both the electorate and politicians have similar objective functions, she maximises an aggregate voting function subject to equation (1.1.3):

$$V_t = \sum_{i=0}^{t} \beta^i g(y_t, \pi_t) \; ; 0<\beta<1 \qquad (1.1.4)$$

where β is the electorates' discount factor.[2] Note that the problem here is to determine an inflation plan p^* that maximises equation (1.1.4); that is, choose a level of inflation to attain the desired level of output growth at the time of the election so as to maximise aggregate voting.

A 1.1.4 *(i) There are two candidates: an incumbent and a challenger. (ii) Party affiliations are ignored.*

A 1.1.5 *(i) Voters dislike unemployment and inflation. (ii) They vote for the incumbent if the economy is doing well: voters are retrospective. (iii) Voters are myopic, they heavily discount the future.(iv) Voters are also assumed to have identical preferences.*

The key feature of assumption 1.1.5 is that voters are myopic. Voters are myopic in the sense that they consider the economy's present performance and that is why they heavily discount the future.

A 1.1.6 *The policy-maker controls a monetary policy instrument.*

A 1.1.7 *The timing of the election is exogenously given.*

1.1.1 The Model at Work

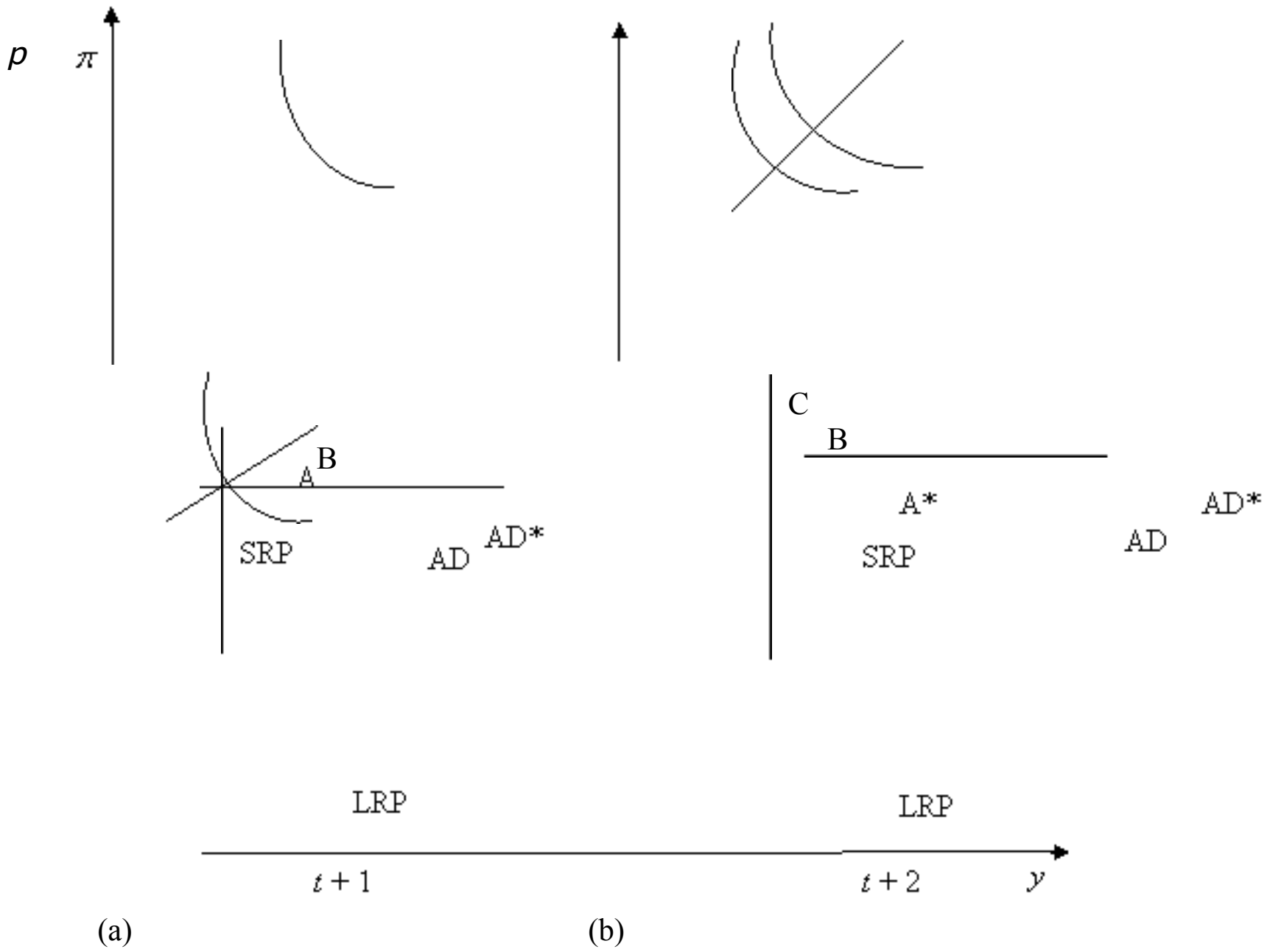

Figure 1.1.1
Source: Adapted from Alesina et al. (1997)

Consider a two-period economy, namely $t + 1$ and t+2. In addition, consider a long-run and a short-run Phillips curve (henceforth, LRPC and SRPC respectively). Consider the LRPC for the case in which $\pi_t = \pi_t^e$, and the SRPC for the case when $\pi_t \neq \pi_{t-1} = \pi_t^e$. In other words, visualise a vertical LRPC and a positively sloped SRPC in (y,p) space. Events unfold as follows. Initially, consider point A in which both the SRPC and the LRPC cross i.e. $\pi_t = \pi_{t-1} = \pi_t^e$. Let the end of period $t + 1$ be the election period. At t+1, the incumbent manipulates policy instruments which increases aggregate demand from AD to AD* up to point B (see figure 1.1.1.a). Notice that at point B inflation is greater than in A so growth is above its natural rate i.e. $y_{t+1} > \bar{y}$. Thus, just before the election growth is above normal and inflation is rising moderately (Alesina *et al*. 1997). Now, suppose that the incumbent is re-elected. At period t+2 inflation expectations begin to increase because of the expectations error at t+1 i.e. the incumbent's sudden manipulation of the economy

caused voters to wrongly estimate expectations, $\pi_{t+1} > \pi^{e}_{t+1}$ (see figure 1.1.1.b). If the re-elected incumbent does not expand aggregate demand even further, demand will move along AD* up to point C in which case inflation is consistently higher than before the election. In this model the government can bring inflation down by implementing contractionary aggregate demand policies. However, Nordhaus (1975) shows that this contractionary aggregate demand policies can only bring the economy back to point A* and not A, where A*>A (i.e. inflation on A* is higher than on A). Thus, inflation remains higher after the incumbent is re-elected.

The model has two important results: (i) one should observe an increase in growth and a moderate increase in inflation before the election period, and (ii) there should be a permanent increase in inflation after the election period even with contractionary aggregate demand policies. This type of cycle clearly yields sub-optimal outcomes in that inflation is permanently increased without any real gains in output growth.

Three major drawbacks should be noted. First, voters are *irrational* in how they form inflation expectations and the way they evaluate candidates' competence. A voter who has lived for more than two election periods should be able to learn and know that the incumbent is likely to behave opportunistically. Thus, the voter should punish the incumbent and reward the challenger in the next election period.

Second, the model assumes that the incumbent controls a monetary policy instrument since she manipulates inflation. However, the assumption is rather troublesome given the degree of central bank independence in industrialised economies. Moreover, central bank independence is regarded as a key factor to control inflation.

Finally, fiscal policies are not considered in the analysis even though empirical evidence suggests that transfers have played an important role in pre-electoral policy-making (Alesina *et al*. 1997; Dranzen 2000). Later theoretical endeavours such as those by Rogoff (1990) and Cukierman & Meltzer (1986) address this point by considering a government budget instead of a Phillips curve in the theoretical framework.

In the next section we look at the rational expectations opportunistic model, which addresses these elements by assuming that voters' expectations are formed rationally.

1.2 The Rational Opportunistic Model

To look at the rational opportunistic model we consider its deviations from the assumptions of the traditional opportunistic model spelled out in section 1.1. Here we focus on the rational opportunistic model presented in Persson & Tabellini (1990) because it follows a Phillips-curve-type framework similar to that of section 1.1.[3]

Rational opportunistic models include rational behaviour into the analysis in two dimensions: (i) voting is not retrospective but forward-looking, and (ii) inflation expectations are rational i.e. they do not depend only on past information of inflation, but on the information available at the time of the election. In a nutshell, rational opportunistic models differ from its non-rational counterpart in assumptions A 1.1.1, A 1.1.2, A 1.1.3, A 1.1.5, and A1.1.6.

Persson & Tabellini (1990) try to explain PBC's by incorporating rational behaviour and by adding a

competence factor between candidates in the analysis. The competence term coupled with information asymmetries account for how efficiently different governments handle the economy. These factors create uncertainty in election outcomes which in turn generate the cycle.

(A l.1.1)* *The Phillips curve includes a competence term*

$$y_t = \bar{y} + \gamma(\pi_t - \pi_t^e) + \varepsilon_t \qquad (1.2.1)$$

where e_t is a competence term. This term can be interpreted as the government's ability to manage the economy efficiently e.g. how the incumbent deals with supply shocks. The competence term follows an MA(1) process:

$$\varepsilon_t = \phi_t + \phi_{t-1};\ E(f_t)=0 \quad \text{" t} = 1,2 \qquad (1.2.2)$$

where f is a random variable which reflects the incumbent's competence. Equation (1.2.2) simply says that competence is random and persistent over time. The government's competence is random because it depends on the nature of the problems it faces. On the other hand, it is persistence because it is assumed that if a particular policy-maker successfully solves a problem today she is likely to solve the same problem tomorrow. Equation (1.2.2) is very important in that it resembles voters' informed guesses when choosing a candidate. The unconditional expectation operator reflects the fact that voters do not know candidates' competence for certain i.e. f_t's values are not known before the election.

(A l.1.2)* *Inflation expectations are rational*

$$\pi_t^e = E(\pi_t / I_{t-1}); \qquad (1.2.3)$$

where $I_{t\text{-}1}$ is the voters' information set at the end of period t-1. But what information is included in $I_{t\text{-}1}$? The competence term is the key variable here: voters can only assume competence values, f_t and $f_{t\text{-}1}$. Persson & Tabellini (1990) impose a series of timing assumptions in which the voters' information set is more clearly presented. Section 1.2.1 explains the role of the competence term and the timing assumptions.

Assumption (A1.1.2)* is important in that the combination of rational expectations and timing assumptions are crucial in the determination of the political business cycle.

(A 1.1.5)* *Voters elect the candidate who maximises their expected utility. Voters are also assumed to have identical preferences.*

Contrary to its counterpart, rational opportunistic models do not consider a myopic electorate. Here the electorate is forward-looking.

(A 1.1.6)* *Policy-makers control inflation directly.*

1.2.1 The Model at Work

Consider two periods: t and t+1. Events unfold as follows. At he beginning of period t: (i) the incumbent knows f_t , (ii) inflation is set, and (iii) everybody observes output growth. Next, at t+1 elections take place but policy and candidates' competence, e_t , are known by the electorate with one period lag; that is, at period t they observe p_t and f_{t-1} but not f_t. Note that if voters could observe actual inflation at the time of the election along with growth and expected inflation, they could calculate competence by solving for e_t in equation (1.2.1). Under this timing assumptions output growth can signal the incumbent's competence. Thus, the incumbent has an incentive to set inflation high for the electorate to observe a high employment level and a high value of competence f_t. At t+1 the incumbent is re-elected and the economy exhibits an output growth above its natural rate.

The model yields two important results. First, if the policy-maker is competent she will generate a political business cycle. Because competence is observed with one period lag the incumbent has the incentive to stimulate growth so as to be regarded by the electorate as a competent candidate. Second, the model implies that competent candidates are always re-appointed. It is rational for the electorate to look at the state of the economy in the election period because it signals the policy-maker's competence. This result follows from the persistence of the competence term e_t : a competent candidate today is likely to be competent tomorrow (see equation 1.2.2). Without this feature voters would not have an incentive to vote for the incumbent during high levels of growth observed in election periods.

One of the model's shortcomings is how events unfold. These are conveniently set in order to obtain a cycle. These timing assumptions may not seem plausible, but the authors justify themselves by arguing that policy-makers do control inflation directly.[4] The timing assumptions make it more difficult for the voters to observe inflation because no monetary signalling is being used. They argue that growth (or unemployment) is more readily observable than inflation.

To summarise, the competence model by Persson & Tabellini generates short-lived cycles based on information asymmetries caused by timing assumptions. The cycle exhibits a pre-electoral boom not followed by a recession afterwards contrary to its traditional counterpart.

1.3 The Rational Expectations and Traditional Opportunistic Models in Perspective

As noted before there are some differences between models. Rational expectations allow for the voters to use all available information when forming expectations and to exhibit a forward-looking behaviour. In rational models cycles are generated by information asymmetries, whereas in the traditional framework cycles are solely created by the opportunistic behaviour of the incumbent to stimulate the economy in order to get re-elected.

There are several implications when including rational expectations. The rational expectations assumption does not allow the incumbent to easily manipulate the economy because she has to be perceived

by the electorate as a competent candidate. If on the other hand inflation expectations are adaptive the policy-maker can freely manipulate and maintain output growth by setting current inflation since expectations and the natural rate of growth are known (equation 1.1.4).

As for traditional models, voters are assumed to only take into account the economy's state at the election period i.e. a myopic electorate. In traditional models the incumbent manipulates the economy before elections take place for the electorate to think that the economy is healthy (she behaves in this fashion because voters are myopic). In rational models, however, voters are not myopic but the incumbent still manipulates the economy so as to be perceived as a competent candidate. Thus, whether voters are myopic or not does not stop the incumbent from manipulating output growth. The assumption, however, changes the individual voter's problem. In rational models voters maximise expected utility and in the traditional framework they maximise their utility at the time of the election. Thus, rationality changes voters' behaviour in terms of how they perceive the economy's performance i.e. rationality allows the electorate to consider future economic performance.

Rational opportunistic models show one intriguing feature: one finds that competent candidates are the ones to take advantage of the opportunistic behaviour to get re-elected. This behaviour, however, does not resemble a competent candidate in that she does not show any capability in terms of managing the economy efficiently. In fact, an opportunistic behaviour yields inflation levels above expectations. This result comes from the model's set-up and it can be regarded as counter intuitive since in reality one would expect a competent policy-maker not to behave opportunistically, but to win the election she has to take advantage of the stimulus she can exert to the economy.

Another drawback of rational models is that they rely on timing assumptions to obtain information asymmetries among players which in turn creates a cycle. Timing assumptions are somewhat troublesome in that they are arbitrarily set, and without them the model's result might not hold.

To summarise, we have looked at the first attempts to explain macroeconomic fluctuations caused by the political system. The pioneer works by Nordhaus (1975) and Persson & Tabellini (1990) try to explain these fluctuations in a non-rational and rational framework. Each model exhibits particular features. Rational models consider a rationally formed inflation expectations framework and a forward-looking electorate, which generate cycles because of information asymmetries caused by timing assumptions. On the other hand, traditional models consider adaptive expectations and retrospective behaviour, which create cycles entirely because of the opportunistic behaviour of the incumbent.

3. The Partisan Political Business Cycle

This theoretical endeavour was pioneered by Hibbs (1977) and further developed by Alesina (1987, 1988a, 1988b) who proposed a rational expectations framework. Different from the opportunistic models, partisan models assume a two-party political system in which each party has a different policy platform: the right-wing party fights inflation and the left-wing party is more concerned about unemployment and growth. Fluctuations in the economy are induced by partisan preferences i.e. how each policy moves along the

Phillips curve. They also differ in that the key actors are no longer political candidates but the electorate: each voter elects the candidate who better suits her preferences according to party platforms. Similar to the opportunistic model, partisan models use a basic three-equation framework: (i) candidates' objective functions, (ii) the economy is described by an augmented-expectations Phillips curve, and (iii) inflation expectations are either adaptive or rational.

3.1 The Traditional Partisan Model

Hibbs (1977) suggested that macroeconomic fluctuations are induced by partisan preferences. Even though his work is mostly empirical, it can be adapted to the basic three-equation framework.

He considers two parties, namely L and R. Party L fights unemployment and party R is more concerned about inflation. Thus, if party L wins the election one should see a decrease in unemployment (increase in inflation) throughout the party's period in office. Instead, if party R wins there should be a decrease in inflation (increase in unemployment).

Following our analytical format, Hibbs partisan model substitutes assumptions 1.1.2, 1.1.3 and 1.1.5 for assumptions (1.1.2)*, (1.1.3)* and (1.1.5)** respectively.

A (1.1.3)* *Politicians are not identical and they prefer to stay in office. There is a left-wing and a right-wing party: the former fights unemployment and the latter inflation.*

The following inequalities summarise each party's preferences:

$$u_L \pounds u_R; \quad p_L \, {}^3 \, p_R; \quad y_L \, {}^3 \, y_R \qquad (3.1.1)$$

where strict inequalities are necessary but not sufficient conditions to yield a cycle[5]; that is, parties may converge towards the middle in order to win (the median voter theorem applies). Thus, as long as electoral results are uncertain differences in party preferences generate a cycle.

Each party has an inflation target which signals its policy platform. Hence, parties win votes depending on the degree of similarity between parties and voters' preferences.

*A (1.1.5)** Voters have different preferences over inflation and unemployment. They choose the left- or right-wing party which better suit their preferences.*

3.1.1 Hibbs' Model Critiques

Hibbs non-rational framework has similar critiques as those made to Nordhaus' model: non-rationality incorporates backward-looking voting behaviour and adaptive inflation expectations. The implications of both assumptions were discussed in section two. Secondly, Hibbs model does not identifies whether parties use monetary or fiscal instruments to hit their targets although a monetary instrument is more likely given that he analyses unemployment-inflation trade-offs (Dranzen 2000: 12).

3.2 The Rational Partisan Business Cycle

Alesina (1987) builds on Hibbs' work by incorporating a rational expectations framework. In a nutshell, Alesina's model differs from its traditional partisan counterpart in that election's outcomes are uncertain, and, of course, in that voters form inflation expectations rationally. Let us now look at these differences.

A.3.2.2 *Inflation expectations are formed rationally.*

As in the opportunistic rational expectations model, voters are assumed to form inflation expectations using all available information at the period before the election. See equation (1.2.5) in (A1.2.1)*.

A 3.2.3 *Politicians have different preferences. The left-wing party fights inflation and the right-wing party is more concerned about unemployment and growth.*

Consider two political parties. Party L is more concerned about unemployment and growth, and party R is concerned about fighting inflation. Alesina defines both parties' preferences as:

$$u_L = -(\pi_t - \overline{\pi}_L)^2 + b_L y_t;\ \overline{\pi}_L > 0,\ b_L > 0. \qquad (3.2.2)$$

$$u_R = -(\pi_t - \overline{\pi}_R)^2 + b_R y_t;\ \overline{\pi}_R > 0,\ b_R > 0. \qquad (3.2.3)$$

where subscripts denote party L and R respectively. Notice that the terms $\overline{\pi}_L$ and $\overline{\pi}_R$ are each party's target rate of inflation in their policy platforms, and each one captures each party's preferences. Also note that these target rates are strictly positive since economic theory suggests the optimal level of inflation is not zero.[6] The terms b_R and b_L capture the benefits to each party from output growth.

Each party's relative preferences are captured by the relationship between these terms: $\overline{\pi}_L > \overline{\pi}_R > 0$ and $b_L > b_R > 0$. The first inequality says that party L is more willing to use inflation to fight unemployment than party R; and the second inequality implies that party L is relatively more concerned about growth than party R. It is important to stress out the fact that this does not mean that party R dislikes growth, but that party L is *relatively* more concerned about growth. In short, party L is more willing to fight unemployment at the cost of higher inflation, and party R is focused on fighting inflation at the cost of lower growth.

A.3.2.5 *Voters have different preferences over the inflation-unemployment trade-off, and based on those preferences they choose the candidate that delivers the highest expected utility: they exhibit a forward-looking voting behaviour.*

Individual preferences are a function of output growth and the inflation rate:

$$u_i = -(\pi_t - \bar{\pi}_i)^2 + b_i \bar{y} \; ; \; b_i > 0, \qquad \bar{\pi}_i > 0 \qquad (3.2.4)$$

where $\bar{\pi}_i$ is the *i*th individual target level of inflation, and b_i is the benefit from output growth. The target inflation level $\bar{\pi}_i$ is what allows for different preferences among voters. Notice that parties and individuals have similar objective functions, what distinguishes them from one another is their respective inflation targets.

Clearly an individual voter will cast her vote for party R if she prefers low inflation levels, and for party L if she is more concerned about being unemployed. These preferences are captured by the terms $\bar{\pi}_i$ and b_i. For instance, a voter with a "high" b_i and $\bar{\pi}_i$ would vote for party L.

3.3 The Model at Work: A General Version

As before the economy is described by an expectations-augmented Phillips curve.

$$y_t = \bar{y} + \gamma(\pi_t - w_t) \qquad (3.3.1)$$

where w_t is the rate of growth of *nominal* wages. The fact that wages are nominal implies that these are not indexed to inflation. Hence, labour unions will try to set wages so as to compensate for any changes in inflation.

Wages are set at the beginning of the period, where a period can be thought of as two years. Thus, unions set wages equal to inflation expectations:

$$\pi_t^e = w_t \qquad (3.3.2)$$

where π_t^e is the inflation rate expected at the beginning of period *t*.[7] Thus, it follows from equations (3.3.1) and (3.3.2) that output is now a function of current and expected inflation:

$$y_t = \bar{y} + \gamma(\pi_t - \pi_t^e) \qquad (3.3.3)$$

Note that equation (3.3.3) is identical to equation (1.1.1) in section 1.1. As before this equation represents the supply side of the economy. A demand side is not explicitly modelled because the model assumes that policy-makers directly set the inflation rate.[8]

As before, consider two political parties: L and R where the former fights unemployment and the latter combats inflation. Events unfold as follows. At the beginning of the period unions set nominal wages equal to expected inflation (equation 3.3.2). After expectations are formed, the policy-maker sets inflation, p_t, taking expectations as given.

Maximising each party's objective function with respect to inflation p_t, yields optimal levels of inflation p_R* and p_L* for party R and L respectively:

$$\pi_t = \pi_k^{\bullet} = \bar{\pi}_k + b_k \gamma / 2; \quad \text{for } k = R \text{ and } L. \tag{3.3.4}$$

Notice that this result is time inconsistent: each party promises a certain level of inflation in their policy platforms, but delivers a different level of inflation. The difference between both inflation levels (inflation or deflation bias) is captured by the term $b_k \gamma / 2$ for $k = R, L$.

To understand this result, consider party L for a moment. In its policy platform the party commits to an inflation level $\bar{\pi}_L$ which is its target inflation level with a corresponding output growth $y = \bar{y}$. In office she is tempted to break her promise by increasing the inflation level to p_L^* which makes output increase above its natural rate to $y¢ = \bar{y} + b_k \gamma / 2$. Clearly this situation brings the economy to a higher inflation and output levels since $p_L^* > \bar{\pi}_L$ and $y¢ > y$. The inconsistency comes from the fact that the policy-maker, when in office, does not commit to the party's policy platform. But why would the policy-maker have an incentive to cheat to the public? For one reason, the time consistent solution yields a lower utility level than the time inconsistent solution. This can be readily seen by substituting the time consistent and the time inconsistent output levels into each party's utility function:

$$u^c(y) = b_L \bar{y},$$
$$u^f(y') = b_L \bar{y} + b_L \gamma / 2$$

where c and f superscripts denote the time consistent and inconsistent (fooling) solutions respectively. Clearly party L has an incentive to cheat since $u^c(y) < u^f(y¢)$.

Analogous to party L, Alesina obtains similar results for party R, which differs from party's L only because of the value of b_R.

Optimal policy rules have the following relationship: $p_R^* < p_L^*$ i.e. inflation is higher when party L is in office. This result follows from the characteristics of each party's preferences. Party L is more concerned about growth and unemployment ($b_L > b_R > 0$) and less concerned about fighting inflation than party R ($\bar{\pi}_L > \bar{\pi}_R > 0$). Thus, party L has a higher incentive to cheat or create unexpected inflation resulting thus in higher equilibrium levels of inflation.

3.4 The Model at Work: Uncertainty in Election Outcomes

Using the results from section 3.3, this section, accounts for uncertainty in election outcomes. Consider periods one and two: an election and a non-election period respectively. Also, let P be party L's probability of winning office, and 1-P party R's probability; where P is the probability of obtaining more than 50 percent of the votes. Voters know each party's objective function so they form period's one inflation expectations based on each parties probability of election and their respective optimal inflation levels:

$$\pi_1^e = P\pi_L^{\bullet} + (1-P)\pi_R^{\bullet} \tag{3.4.1}$$

Obviously, there are two possible election outcomes. Table 3.4.1 has period's 1 economic outcomes for either election outcome.

Table 3.4.1

Elected Party:	L	R
Inflation	$\pi_1 = \pi_L^*$	$\pi_1 = \pi_L^*$
Output	$y_1^L = \gamma P(\pi_L^* - \pi_R^*) + \bar{y}$	$y_1^R = \gamma(1-P)(\pi_L^* - \pi_R^*) + \bar{y}$

Results are obtained by substituting equation (3.4.1) into equation (3.3.3) and setting p_t equal to the winning party's optimal inflation level.

Because of the elections uncertainty, inflation expectations are wrongly estimated in the first period (equation 3.4.1). However, in the second period, with no election uncertainty, expectations are correctly estimated and they therefore begin to adjust to the real inflation rate set by the winning party. Thus, $\pi_2^e = \pi_L^*$ if party L wins, $\pi_2^e = \pi_R^*$ if party R wins, and output growth is equal to its natural rate with either party in office ($y_2 = \bar{y}$).

Hence, with certainty there is no cycle since $y_2 = \bar{y}$, and under uncertainty the cycle is generated by having inflation above expectations, and consequently output is above its natural rate of growth ($y_1 > \bar{y}$).

Notice that output fluctuations also depend upon the degree of political polarisation i.e. how different are policy platforms $\bar{\pi}_L$ and $\bar{\pi}_R$. Hence the following result: political polarisation creates wider economic fluctuations (Alesina & Rosenthal 1995:176). In addition, the degree of a positive inflation shock influences the degree of the cycle: if party R wins inflation shocks should be lower than if party L wins because the shock is less expected given the party's policy platform.

To summarise, if party L wins inflation increases above expectations and output grows above its natural level. If, on the other hand, party R wins inflation is below expectations and output is below its natural rate. In the second period output returns to its natural level regardless of the party in office because of the wage (inflation expectations) adjustment in the economy.

3.5 The Rational and the Traditional Partisan Models in Perspective

In Hibbs and Alesina's models parties' preferences are similar. Hibbs' model assumes adaptive inflation expectations and backward-looking behaviour. Adaptive expectations allow the incumbent to increase and sustain high levels of inflation during her entire period in office. Moreover, adaptive expectations imply that expectations take time to adjust and the model therefore yields long-lived cycles. On the contrary, rational partisan models assume that formation of inflation expectations are rational and voting behaviour is forward-looking. In rational models expectations adjust immediately after wage contracts are renewed yielding thus short-lived cycles. Both models generate a cycle: rational models because of the

uncertainty of election outcomes, and traditional partisan models because of different party preferences.

Two questions are important when assessing the rational-partisan model. First, is the wage-contract assumption which allows labour unions to adjust for inflation variations after the election period plausible? As in the rational opportunistic model, timing assumptions allow for inflation surprises even under rational expectations; a change in the timing assumption would remove the model's capability of generating a cycle (Dranzen 2000: 15). The second problem is about election periods. These reasons are the driving force of the model that generate cycles and yet they are exogenously determined. Thus, a better microstructure is necessary to endogenise such determinant factors.

4. Overview

Compared to opportunistic models, rational models explain macroeconomic fluctuations caused by the political system in a more realistic fashion since they assume rationality in their models. The advantage of rationality is that it allows voters to have a forward-looking behaviour and to use all available information when forming inflation expectations.

Aside from the rationality assumption, rational models have two common features: (i) they rely on timing assumptions to obtain fluctuations in the economy, and (ii) cycle effects are short-lived. In partisan-rational models cycles occur because of the uncertainty in election outcomes, and the sluggishness of wages. In the opportunistic-rational model cycles are generated by information asymmetries caused by the timing assumptions. One of the shortcomings of these models is that they take these driving forces as exogenous.

As for the traditional models, they also show two common features: (i) they do not assume rationality, and (ii) cycles are long-lived. The first feature implies a naïve electorate that does not punish the incumbent if she consistently tries to manipulate the economy, and a backward-looking behaviour. Feature (ii) comes directly from the adaptive expectations structure since they imply that any incumbent is able to manipulate and maintain high levels of inflation.

A common feature among all the models is that they try to explain cycles through an inflation-unemployment trade-off. The use of the Phillips curve implies an incumbent's manipulation of the economy via monetary policy even though empirical evidence on the US suggests that monetary policy is neither contractionary nor expansionary before elections (Alesina et al 1997; Dranzen 2000). Central Bank Independence, moreover, is an issue to account for when modelling PBC's under a Phillips-curve set-up since highly independent central banks are likely to weaken macroeconomic manipulation (Pitruzzello 1999: 5). Fiscal impulses might be therefore a new line of research to consider when modelling PBC's.

In terms of the political structure, all models assume a presidential although Alesina & Rosenthal (1995) considers a legislative-executive political system in which legislative and executive elections are held. This model tries to describe how a divided government influences PBC's, but it disregards party coalitions in multi-party systems. The analysis also neglects interest groups and how they can lobby for the implementation of a particular policy. Another line of research would be to mix partisan and opportunistic features in a single model to account for opportunistically behaved parties in the political system (Alesina

1995: 159).

As for the empirics of PBCs, further research is needed as the evidence in this area is ambiguous. Furthermore, evidence of PBC in Puerto Rico is another topic of interest and should be developed so as to analyse its policy implications. In addition, the Puerto Rican economy has been heavily criticised by local analysts and policy-makers because most of them contend that the incumbent government stimulates employment levels before elections to increase its likelihood of re-election. Indeed, government employment is the second source of total employment in the island. Moreover, construction activity in Puerto Rico has also been regarded by the public as a sector in which the government plays a crucial role since construction is regarded by the incumbent as a quick and easy way to stimulate the economy. Thus, evidence of Political Business Cycles in Puerto Rico should be studied and its policy implications analysed. This would benefit for both businesses and policy-makers as it would provide a deeper understanding of the behaviour of the Puerto Rico economy.

Notes

[1] Nordhaus uses a different but equivalent description of the Phillips curve; where inflation is a function of unemployment and expected inflation.

2 In equation (1.1.4) the discount factor b assumes a value close to 1 in order to characterise voters' myopia (i.e. A 1.1.5). As the election period gets closer, voters put a higher weight on economic performance.

3 The works by Rogoff (1990) and Cukierman & Meltzer (1986) also build a rational opportunistic model by considering a government budget instead of a Phillips curve i.e. they assume an incumbent manipulating a fiscal rather than a monetary instrument.

4 Assumption (A 1.1.6)*.

5 Dranzen (2000: 12)

6 See Alesina & Rosenthal 1995 for a discussion on this point.

7 π_t^e is formed rationally by assumption A.3.2.2.

8 The point of whether the incumbent directly manipulates a policy instrument is taken into account by Persson and Tabellini (1990) as we saw in section two. However, most of the models do not delve into such details when setting up their frameworks. See footnote 3 in Alesina & Rosenthal (1995: 167).

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