POLITICAL CYCLES AND INTERNATIONAL INTERDEPENDENCE*

1. Introduction

The modern analysis of political cycles in partisan models began with Alesina (1987) and was carried further in other subsequent works (e.g. Alesina (1988a and 1988b) and Alesina and Spears (1988)). These articles, examining the effect of electoral competition on economic activity, show that business cycles can be triggered in a country immediately following national elections because the choice of the government elected differs from its expected value, namely a weighted average of the optimal choices of different coalitions. The importance of these cycles is confirmed by many empirical studies on US states, OECD countries and industrial economies in general (see Alesina (1988b), Alesina and Rosenthal (1995) and Alesina, Roubini and Cohen (1992, 1993 and 1997)).

An increasingly important recent phenomenon has been integration between national economies. One consequence of this is that events occurring in one country have significant effects in the others, so that the behaviour of a government affects the economic performance of other economies. These international linkages have been examined by a substantial literature studying the interaction among governments policies (see Hamada (1974 and 1976), Cooper (1985) and Canzoneri and Henderson (1988 and 1991)).

This paper studies the effects of international interdependence on political cycles. The analysis employs a simple interaction between two economies due to the influence of foreign price changes on domestic inflation and examines the consequences of domestic elections, foreign elections and elections taking place simultaneously domestically and abroad.

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To my knowledge there are just two other works on political cycles in a two-country framework. Lohman (1993) examines the effects of monetary policy cooperation on the political cycles caused by domestic elections. My analytical framework is partially similar[1], but the topic is completely different.

Sapir and Sekkat (1999) examine optimum electoral areas, studying costs and benefits of electoral coordination between two economies. Although the analysis exhibits some analogies with the present paper, there are some important differences in both framework and results.

First, the linkages analysed are different. The two spillovers introduced by Sapir and Sekkat relate to the effects of foreign policy on domestic employment, whereas the present paper considers linkages involving inflation. This difference has two main implications: a) unlike the spillovers posited by Sapir and Sekkat, the strength of the inflation linkages affects the sign as well as the amplitude of the political cycle; and b) the present framework evidences the role of the two countries openness in determining political cycles.

Second, because of the focus on the specific problem examined, Sapir and Sekkat restrict their analysis to cases relevant for the study of optimum electoral areas, thus excluding two important cases of international interdependence. Sapir and Sekkat, in particular, do not analyse the effects of the introduction of international linkages on the cycles caused by domestic elections, whereas this paper compares the cycles obtained with and without international linkages. Furthermore Sapir and Sekkat propose a complete analysis of simultaneous elections only when the same party is the winner in both countries, whereas I consider a general case where all the possible outcomes in the two elections are admitted. This work will also show that the timing of elections in the two countries is not neutral for the amplitude of the cycles.

The paper proceeds as follows. Section two presents the framework analysed and examines government optimal behaviour. Section three studies the effects of elections and the features of political cycles. Section four proposes the economic interpretation of the results obtained. Section five concludes.

[1] Both works use the analytical setting of Canzoneri and Henderson (1988).

2. Government optimal behaviour

The model studied in this work is represented by a typical partisan model where international linkage is introduced. The partisan model is founded on the structure proposed in Alesina, Roubini and Cohen (1997) (henceforth abbreviated ARC) while the international linkage is related to the effect of foreign price changes on domestic inflation[2].

We consider two countries (home and foreign), each specialised in the production of a different good[3]. In our notation foreign country variables are denoted by an asterisk. We start by examining the home country, assuming that two political parties vie to govern the economy: the left-wing party (L) and the right-wing party (R). Following the formulation proposed in ARC, we assume that the preferences of party j are given by

$$U^j = \sum_0^{\infty} (1+\rho)^{-t} \left[-\left(\pi_t - \overline{\pi}^j\right)^2 + b^j y_t \right] \quad \text{for} \quad j = L, R \tag{1}$$

where π_t is inflation, $\overline{\pi}^j$ is the inflation desired by party j, y_t is output growth, ρ is the discount rate and b^j is a parameter whose value is different for the two parties. We assume furthermore that

$$\overline{\pi}^L \geq \overline{\pi}^R \geq 0 \tag{2}$$

$$b^L > b^R \geq 0 \tag{3}$$

These assumptions imply that both parties dislike deviations of inflation from its desired level and like growth and that the left-wing party cares relatively more about growth than the right-wing party.

We assume that home consumers buy both domestic and foreign goods. This assumption implies that the consumer price index in the home country depends on prices of goods produced both at home and abroad. We further assume that the exchange rate is either fixed or exogenously given[4]. Domestic inflation π is thus given by[5]

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[2] The framework proposed is partially founded on Canzoneri and Henderson (1988) and Drazen (2000) chapter 12 part II.

[3] Note that this assumption implies that the purchasing power parity does not hold.

[4] The exchange rate, whether flexible, is not explicitly modelled given the focus of the analysis on short run output fluctuations. Indeed, as shown by an overwhelming empirical evidence, the short-run dynamics of the exchange rate is driven by forces mainly related to capital movements and financial markets behaviour, whose examination is beyond the scope of this paper.

With an exogenous exchange rate its time variation can be normalised to zero.

[5] To simplify the notation we will neglect from now the subscript time index t.

$$\pi = ap + (1-a)\,p^* \tag{4}$$

where p is the rate of change of the domestic price and p^* is the rate of change of the foreign price.

We assume furthermore that the output produced in the home country is an increasing function of employment according to the following equation

$$Y = \bar{Y} + (1-a)\,N \tag{5}$$

where $0 < a < 1$, Y is the logarithm of output, N is the logarithm of employment and $\bar{Y} = log\left(\frac{1}{1-\beta}\right)$.

Real wages are set to maximise firms profits and are equal to the marginal product of labour, so that

$$W - P = -aN \tag{6}$$

where W is the logarithm of wages and P is the logarithm of the output price.

We assume that in each period unions specify nominal wages before knowing the price level. Assuming furthermore that nominal wages are set by unions so that all currently employed workers (possibly coinciding with unions members) are expected to be employed in the subsequent period and using equation (6) to compute growth rates (obtained as differences in logarithms) we get

$$w = p^E \tag{7}$$

where w is the rate of growth of wages and p^E is the expected change of the domestic price.

Computing the growth rates of Y and N from equations (5) and (6) and combining them with (7), finally, we get

$$y = \gamma(p - p^E) \tag{8}$$

where $\gamma = \frac{1-\beta}{\beta}$ is a constant.

We finally assume that the foreign country is also characterised by five equations identical to (1), (2), (3), (4) and (8) in which the variables π, y, p, p^* and the constants $\bar{\pi}^j$, b^j, $\bar{\pi}^L$, $\bar{\pi}^R$, b^L, b^R, α, γ are replaced respectively by π^*, y^*, p^*, p, $\bar{\pi}^{*i}$, b^{*i}, $\bar{\pi}^{*L}$, $\bar{\pi}^{*R}$, b^{*L}, b^{*R}, α^*, γ^*.

We can now examine the optimal behaviour of the home government when party j is in office. Starting from Alesina (1987), in modern political cycle models, it is assumed for simplicity that the government directly controls inflation (instead of controlling an instrument related to it). Similarly and for the same reasons, we

assume in this framework that the government can directly control the domestic price change p.

In order to examine government behaviour, we substitute equations (4) and (8) into (1) and differentiate with respect to p. These computations imply that the optimal level of p for party j is given by

$$p^j = \frac{\gamma b^j}{2a^2} + \frac{\bar{\pi}^j}{a} - \frac{(1-a)}{a} p^{*i} \tag{9}$$

where p^{*i} is the foreign price change when party i is in office abroad. This equation shows the reaction function of domestic government (with party j in office) given the foreign price change p^{*i}.

Similar computations indicate that the foreign country reaction function is given by

$$p^{*i} = \frac{\gamma^* b^{*i}}{2a^{*2}} + \frac{\bar{\pi}^{*i}}{a^*} - \frac{(1-a^*)}{a^*} p^j \tag{10}$$

We can now compute the Nash equilibrium of the model solving (9) and (10) together. We obtain:

$$p^j = \frac{1}{a + a^* - 1}\left[\frac{a^* \gamma b^j}{2a} + a^* \bar{\pi}^j - \frac{(1-a)\gamma^* b^{*i}}{2a^*} - (1-a)\bar{\pi}^{*i}\right] \tag{11}$$

$$p^{*i} = \frac{1}{a + a^* - 1}\left[\frac{a\gamma^* b^{*i}}{2a^*} + a\bar{\pi}^{*i} - \frac{(1-a^*)\gamma b^j}{2a} - (1-a^*)\bar{\pi}^j\right] \tag{12}$$

Equation (11) (or (12)) shows the optimal level of price change for the home (foreign) country when party j (party i) is in office and party i (party j) is in office in the other country.

Note that, starting from equation (11), we can obtain the optimal value of p in the absence of international interdependence (which corresponds to the optimal domestic price change in the ARC model) assuming $a = a^* = 1$. This rate of domestic price change is given by

$$p^j = \left[\frac{\gamma b^j}{2} + \bar{\pi}^j\right] \tag{13}$$

3. Political cycles

Starting from this framework, let us now examine the effects of elections on output growth in the home country. Given the two-country structure of the model, four situations are possible:

a) elections in the home country, no elections abroad
b) elections in the foreign country, no elections at home
c) elections in both countries
d) no elections.

For all these cases we compare the actual level of p with its expected value p^E in order to analyse the fluctuations in output growth y. It is easy to see that case d) is irrelevant since in that situation p is always equal to p^E (because of the absence in both countries of uncertainty on the coalition in office) and y is zero. The analysis is accordingly limited to cases a), b) and c).

a) elections in home country, no elections abroad

We now assume that elections are held in the home country while in the foreign country party i is in office. Following ARC, we assume that the probability of party L winning the election is known and is equal to q while that of party R winning is $1-q$. Given these assumptions, the value of p^E is given by

$$p^E = qp^L + (1-q)\,p^R \tag{14}$$

where p^L and p^R are the values stated in equation (11) for $j = L$ and $j = R$ respectively.

Substituting p^L and p^R into (14) and subtracting (11), one easily gets the value of unanticipated domestic price change that determines output growth y. We have

$$p^j - p^E = \frac{a^*}{a + a^* - 1}\left[\frac{\gamma}{2a}\left(b^j - b^E\right) + \left(\overline{\pi}^j - \overline{\pi}^E\right)\right] \tag{15}$$

where

$$b^E = qb^L + (1-q)\,b^R \tag{16}$$

$$\overline{\pi}^E = q\overline{\pi}^L + (1-q)\,\overline{\pi}^R \tag{17}$$

As in traditional partisan models, since the value in (15) is different from zero, we have a business cycle generated by elections. In order to compare the standard political cycles in the literature with those obtained in equation (15) we compute the value $p^j - p^E$ in the ARC model assuming $a = a^* = 1$. This value is given by

$$p^j - p^E = \left[\frac{\gamma}{2}\left(b^j - b^E\right) + \left(\overline{\pi}^j - \overline{\pi}^E\right)\right] \tag{18}$$

Comparing (15) and (18) it is easy to see that the sign of the political cycle when there is international interdependence can be

either the same or opposite with respect to the traditional literature according to the strength of inflation linkages. In particular:

Result 1. *If* $a+a^*>1$ *(i.e. if the international linkages are weak) then the political cycle produces effects that are the same in sign of those obtained in the ARC model (low growth if the right-wing party wins and high growth if the left-wing party wins). If, on the contrary,* $a+a^*<1$ *(i.e. if the international linkages are strong) then the political cycle produces effects that are opposite to those obtained in the ARC model (high growth if the right-wing party wins, low growth if the left-wing party wins*).

With reference to the amplitude of the cycle the comparison between the two equations furthermore show that the absolute value of (15) is larger than the one of (18) [6]. This implies that:

Result 2. *Whatever is the sign of the cycle, its amplitude is larger when there are international linkages.*

b) elections abroad, no elections at home

Let us now assume that in the home country party j is in office while elections are held in the foreign country. The probability of party L winning the foreign elections is known and is equal to q^* while that of party R winning is equal to $1-q^*$. Given these assumptions the expected value of p is given by

$$p^E = q^* p^j(p^{*L}) + (1-q^*)p^j(p^{*R}) \tag{19}$$

where $p^j(p^{*L})$ is the domestic price change chosen by party j when party L is in office abroad and $p^j(p^{*R})$ is the domestic price change chosen by party j when party R is in office abroad.

From equations (11) and (19) we can compute the unanticipated domestic price change, which is given by

$$p^j - p^E = -\frac{(1-a)}{a+a^*-1}\left[\frac{\gamma^*}{2a^*}\left(b^{*i} - b^{*E}\right) + \left(\bar{\pi}^{*i} - \bar{\pi}^{*E}\right)\right] \tag{20}$$

where b^{*E} and $\bar{\pi}^{*E}$ are defined as in equations (16) and (17), replacing q, b^L, b^R, $\bar{\pi}^L$ and $\bar{\pi}^R$ with q^*, b^{*L}, b^{*R}, $\bar{\pi}^{*L}$ and $\bar{\pi}^{*R}$.

Equation (20) shows that also in the case of elections abroad p^j is different from p^E and there is a political cycle in the home country.

[6] With international linkages we have $a<1$ implying $\frac{a^*}{a^*+a-1}>1$ and $\frac{\gamma}{2a}>\frac{\gamma}{a}$.

Since the signs of (20) and (15) are opposite we have furthermore that:

Result 3. *The effects of the political cycle due to foreign elections are opposite to those produced by domestic elections.*

Moreover, as in case a), the direction of the political cycle depends on the value of $a+a^*$. In particular:

Result 4. *Assuming* $a+a^*>1$, *foreign elections cause high growth at home if the right-wing party wins and low growth if the left-wing party wins. Assuming* $a+a^*<1$, *foreign elections cause high growth at home if the left-wing party wins and low growth if right-wing party wins.*

c) elections in both countries

The last case is that of both domestic and foreign elections at the same time. This situation sums the features of the two cases previously examined and presents four probabilities of victory: q and $1-q$ (for parties L and R in the home country) and q^* and $1-q^*$ (for parties L and R in the foreign country).

In this case we therefore have

$$p^E = qq^*\, p^L\left(p^{*L}\right)+q(1-q^*)\, p^L\left(p^{*R}\right)+$$
$$+(1-q)q^*\, p^R\left(p^{*L}\right)+(1-q)(1-q^*)\, p^R\left(p^{*R}\right) \qquad (21)$$

From this equation we get that

$$p^j - p^E = \frac{1}{a+a^*-1}\left[a^*\left(\frac{\gamma}{2a}\left(b^j-b^E\right)+\left(\overline{\pi}^j-\overline{\pi}^E\right)\right)+\right.$$
$$\left.-(1-a)\left(\frac{\gamma^*}{2a^*}\left(b^{*i}-b^{*E}\right)+\left(\overline{\pi}^{*i}-\overline{\pi}^{*E}\right)\right)\right] \qquad (22)$$

Equation (22) shows that, in this case, political cycles are originated by the uncertainty both on home-country policy (represented by the terms b^j-b^E and $\overline{\pi}^j-\overline{\pi}^E$) and on foreign-country policy (represented by the terms $b^{*i}-b^{*E}$ and $\overline{\pi}^{*i}-\overline{\pi}^{*E}$). Since the signs of the two terms in the square brackets in (22) are opposite we can conclude that:

Result 5. *When both domestic and foreign elections are simultaneously held, political cycles are larger in amplitude if the winning parties in the two countries are different, smaller if the winner is the same.*

We have furthermore that:

Result 6. *Assuming* $a+a^*>1$, *the greatest growth is obtained when the left-wing party wins the domestic elections and the right-wing party wins abroad, the least when the right wins at home and the left wins abroad. On the contrary, assuming* $a+a^*<1$, *the greatest growth is obtained when the right-wing party wins the domestic elections and the left-wing party wins abroad, the least when the right wins at home and the left wins abroad.*

4. Economic interpretation

Let us now examine the economic interpretation of the result obtained in the previous section. We start from result 3 indicating that the effect of foreign elections are opposite to those of domestic elections. This conclusion depends on the effect on domestic inflation of the choice of the foreign price change which, given the features of the reaction function, induces the domestic government to change the value of p in the opposite direction. Thus if, for instance, the right-wing party wins the foreign elections[7] then the foreign component of domestic inflation is lower than expected. This will induce the domestic government (whichever party is in office) to increase p in order to optimise the choice of π and y and will cause the domestic price change to be larger than expected and output growth to be high[8].

A similar argument also explains results 1, 4 and 6. The foregoing discussion clearly shows how, when there are international linkages, the decision of one government causes an opposite reaction by the other. Both governments take this reaction into account in the choice of their optimal policy. If the linkages are very strong (i.e. if $a+a^*<1$), this fact will push the newly elected government to choose a policy opposite to that chosen when the linkages are weak (i.e. if $a+a^*>1$). This choice is made since in this case the reaction of the other government is the main factor determining domestic inflation.

The previous result, furthermore, is open to an interesting interpretation. Given the assumption on equation (4), parameters a

[7] These considerations are proposed under the assumption $a+a^*>1$. Similar reasoning can apply if $a+a^*<1$.

[8] In other words, since equation (4) can be seen as a constraint for the government, the reduction in p^* is a relaxation of this constraint, which leads the government to increase p.

and a^* depend negatively on the share of goods imported in each of the two countries. This means that a and a^* are small when the transactions between the two economies are large, i.e. when the two economies are very open. Results 1, 4 and 6 thus indicate that the sign of the cycles depends on the openness of the two economies.

Result 2 follows from the role of international linkages in determining the effects of domestic policy on domestic inflation. When inflation depends in part on foreign price changes, the choice of p affects just a fraction of π . This implies that, in order to amplify the effect on π, the government will multiply each of its target values by a factor larger than 1 [9]. This increases the difference between p and p^E and thus the amplitude of the cycle caused by domestic elections.

Finally, result 5 depends on the simultaneous presence of the electoral effects at home and abroad. Since, as it is shown by result 3, these effects are opposite, they are mutually reinforcing if the winning parties are different and mutually contrasting if the winner is the same.

This conclusion has two implications. First, the degree of heterogeneity in voters preferences matters for political cycles. Indeed, if the voters in the two countries have similar political preferences, the political cycles can be smaller. Furthermore, as anticipated in the introduction, Sapir and Sekkat (1999) neglect the complete analysis of contemporaneous elections since, when all possible results are allowed, the timing of elections in the two countries is welfare-neutral. Result 5, however, clearly indicates that this conclusion does not hold for the amplitude of the cycles. To better show this point, let us consider a simple example. Assume that the objectives of the two parties are the same in the two countries (i.e. $\bar{\pi}^j = \bar{\pi}^{*j}$ and $b^j = b^{*j}$), that $\gamma = \gamma^*$ and $q = q^*$ and finally that $a = 0.8$ and $a^* = 0.4$. In this case it is easy to see that, when the same party wins in both countries, we have no cycles if the elections are contemporaneous and two years with cycles opposite in sign but equal in amplitude

[9] To see this point let us consider the simple case where $a < 1$ and $a^* = 1$. In this case equations (11) and (12) become respectively $p^j = \frac{1}{a}\left[\frac{\gamma b^j}{2a} + \bar{\pi}^j - \frac{(1-a)\gamma^* b^{*i}}{2} - (1-a)\bar{\pi}^{*i}\right]$ and $p^{*i} = \frac{\gamma^* b^{*i}}{2} + \bar{\pi}^{*i}$. Computing $\pi = ap + (1-a)p^*$ it is easy to see that the factor $\frac{1}{a}$ in the equation for p^j is introduced to completely offset the effect of p^* on domestic inflation.

if they are held in successive years. Thus the timing of elections is relevant for the amplitude of political cycles.

5. Conclusions

We have examined in this work the features of political cycles when international economic interdependence is explicitly considered. In particular, we have looked at the effects of international linkages on the business cycle generated by domestic elections and the nature of the business cycle produced by foreign elections and by simultaneous domestic and foreign elections.

The main conclusions obtained can be summarised as it follows. Firstly, with reference to domestic elections, international interdependence increases the amplitude of the political cycles vis-à-vis the traditional models. Secondly, it is shown that not only home but also foreign elections can generate domestic political cycles, and that the sign of the cycle produced by the victory of a party in foreign elections is always opposite to that produced by a domestic victory for the same party. Furthermore the analysis of simultaneous elections shows that the amplitude of the political cycle is smaller if the same party (either left or right) is victorious in both countries and larger if the two winners are different. Finally, in all the three cases studied, the sign of the cycle depends on the strength of the inflation linkages which can be seen as a measure of the openness of the economies examined.

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ABSTRACT

This paper studies the features of political cycles in a setting of international interdependence caused by inflation linkages. The main results are the following. Political cycles caused by domestic elections are larger than without international linkages. Political cycles caused by domestic and foreign elections have opposite effects. If elections are held simultaneously at home and abroad, the amplitude of the cycle is smaller when the winning coalition is the same and larger when the winner is different. In all cases analysed not only the amplitude but also the sign of the cycles depends on the openness of the countries examined.

Keywords: Political cycles, Elections, International interdependence
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RIASSUNTO

Cicli politici e interdipendenza internazionale

Il lavoro studia le caratteristiche dei cicli politici in un contesto di interdipendenza internazionale dovuta alla presenza di legami fra i tassi di inflazione di economie diverse. I principali risultati ottenuti sono i seguenti. I cicli politici generati da elezioni interne sono più forti in presenza di interdipendenza fra le economie. I cicli politici prodotti da elezioni interne e da elezioni estere hanno direzioni opposte. Se le elezioni si svolgono contemporaneamente all'interno e all'estero l'ampiezza dei cicli è minore quando la coalizione vincente è la medesima e maggiore quando essa è differente. In tutti i casi esaminati non solo l'ampiezza ma anche la direzione dei cicli dipende dal grado di apertura delle economie considerate.