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Document de treball n.08 - 2013

DEPARTAMENT D'ECONOMIA – CREIP
Facultat d'Economia i Empresa



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Edita:

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www.fcee.urv.es/departaments/economia/public_html/index.html
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Adreçar comentaris al Departament d'Economia / CREIP

Dipòsit Legal: T - 485 - 2013

ISSN edició en paper: 1576 - 3382

ISSN edició electrònica: 1988 - 0820

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Rational Partisan Theory with fiscal policy and an independent central bank

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March 22, 2013

Abstract

The empirical evidence testing the validity of the rational partisan theory (RPT) has been mixed. In this article, we argue that the inclusion of other macroeconomic policies and the presence of an independent central bank can partly contribute to explain this inconclusiveness. This article expands Alesina's (1987) RPT model to include an extra policy and an independent central bank. With these extensions, the implications of RPT are altered significantly. In particular, when the central bank is more concerned about output than public spending (an assumption made by many papers in this literature), then the direct relationship between inflation and output derived in Alesina (1987) never holds.

Keywords: central bank, conservativeness, political uncertainty.

JEL Classification: E58, E63.

1 Introduction

According to Rational Partisan Theory (Alesina, 1987), the economy will be affected by the voters' anticipation of election results. If agents sign (wage) contracts before an election takes place, they will try to predict the uncertain election results. Therefore, in an election year, expected and actual inflation will differ because (wage) contracts and expectations are set before the elections occur. Traditionally, left-wing governments are less inflation averse and more focused on promoting employment and output growth than right-wing governments. Thus, when a left-wing party wins an election, the anticipated inflation will be too low as agents had accounted for the possibility of a right wing victory. This will generate a post-election boom. Similarly, when a right-wing

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party wins, anticipated inflation will be too high and a post-election recession will follow.

Alesina (1987) studied the partisan effects when there is only one policy, monetary policy, which is controlled by the government, and obtained what has become the traditional rational partisan theory (RPT) results just described. Numerous empirical articles have tested the results derived by RPT. Berlemann and Markwardt (2007) review this literature and conclude that the empirical evidence of RPT is mixed and inconclusive. For instance, Alesina and Roubini (1992) presented a study of 18 OECD countries supporting RPT, whereas Kiefer (2000), updating the same dataset, found RPT inconsistent with the observations. Further, Alesina et al. (1997), Maloney et al. (2003) and Berlemann and Markwardt (2007) find evidence in favour of RPT, whereas Carlsen and Pedersen (1999), Faust and Irons (1999) and Heckelman (2006), among others, don't.

Shelton (2012) considers the response of economic forecasts (rather than actual data) to changes in political leadership in industrialised economies. He finds different responses for three groups of countries.¹ In one set of countries (France, Italy, Spain), the left is expected to deliver higher output growth with higher inflation, like predicted by RPT. In another set of countries (United States, United Kingdom, Canada), the left is expected to deliver higher output growth but with no effect on inflation. Finally, for the third set of countries (Germany, Japan, the Netherlands, Norway, Sweden), the left is associated with lower output growth and a higher inflation, which would contradict the traditional RPT.

The majority of these empirical articles do not explicitly include an independent central bank. The last two decades, however, have witnessed a global movement towards more central bank independence (see, for instance, Crowe and Meade (2007) and Cukierman (2008)), implying that monetary policy is taken away from the control of politicians. Nonetheless, the implicit assumption in the previous studies has been that the introduction of an independent central bank would not significantly alter the predicted RPT results.

In this article we will extend Alesina's seminal model in two ways: first, we will include another policy (fiscal policy), and second, we will introduce an independent central bank responsible for monetary policy. Including fiscal policy in the analysis introduces a trade-off between stimulating output growth and collecting revenue through taxes. We will show that including two policies in the analysis will alter the theoretical implications of the RPT, in the sense that, even though inflation should be higher after elections when a left wing party is elected, output will not necessarily follow that pattern. Second, when an independent and conservative central bank which is responsible for monetary policy is introduced in the model with two policies, the implications of RPT can be altered significantly for both inflation and output.

The article is organised as follows. Section 2 outlines the model and presents the formal analysis. Concluding remarks are presented in Section 3.

¹These groups correspond to the three varieties of capitalism defined by Hall and Soskice (2001).

2 The Model

In this section, we will extend the analysis of Alesina and Tabellini (1987) and Alesina and Gatti (1995) to develop a rational partisan model with two instruments (and, thus, two policies). We will assume that there are two parties competing for office, L (a left-wing party) and R (a right-wing party). If party j is in office, $j = L, R$, the output is given by

$$x_j = \pi_j - \pi^e - \tau_j - w^* + \varepsilon, \quad (1)$$

where π_j and π^e are the actual and expected inflation rates, respectively. Moreover, τ_j represents taxes levied on output, w^* denotes the target real wage that workers seek to achieve, and ε is a productivity shock such that $E(\varepsilon) = 0$ and $\text{var}(\varepsilon) = \sigma_\varepsilon^2$.

The government j budget constraint is

$$g_j = \tau_j + \pi_j, \quad (2)$$

where g_j denotes the ratio of public expenditures over output when party j is in office. Note that public spending will be financed by a distortionary tax (controlled by the fiscal authority) and/or by money creation (controlled by the authority responsible for monetary policy).²

We assume that the loss function for party j is given by

$$V_{Gj} = \frac{1}{2} (\pi^2 + \delta_j(x - x^*)^2 + \gamma_j(g - g^*)^2), \quad (3)$$

where $j = L, R$ indicates the party and $\delta_j, \gamma_j > 0$. Thus, the party in office wishes to minimize the deviations of inflation, output and public spending from some targets. Without loss of generality, the inflation target has been set equal to zero.

Following Alesina and Gatti (1995), we assume, for simplicity, that both parties share the same goals. However, we allow them to differ in the relative weights attributed to output and public expenditures with respect to inflation. Which weight is higher is an empirical question, the answer to which may vary across countries and time periods. For this reason, we will classify the parties according to two measures: (i) their inflation aversion and (ii) their relative interest in stabilising output over spending.

(i) *The inflation aversion.* The literature traditionally assumes that the left (L) tends to be associated with less inflation stabilisation than the right (R). If we let $m_L = \frac{\frac{1}{\delta_L} + \frac{1}{\gamma_L}}{2}$ and $m_R = \frac{\frac{1}{\delta_R} + \frac{1}{\gamma_R}}{2}$ represent a measure of each party's inflation aversion, then, if $m_R > m_L$, the goal of stabilising inflation is more important for party R than for party L , or, in other words, party R is more inflation averse than party L .³

²The nature of the game that will be presented in the next lines is essentially static, and for this reason we do not include a dynamic expression with debt.

³Mathematically, the arithmetic mean of the weight of inflation relative to output and

(ii) *The relative interest in stabilising output over spending.* It is not clear a priori what objective will be assigned a larger weight by a left or a right wing party. In fact, there will be scenarios in which a party, independently of its ideology, might give more weight to the spending objective. The years between 2010 and 2012 have witnessed different partisan governments (United Kingdom, Ireland, Spain, Italy...), prioritise the fiscal consolidation process. Further, the sequestration in the US, which took effect on the 1st of March 2013, is another example of fiscal discipline being applied with independence of the ideology of the party in power. Therefore, we will say that if party j is relatively more interested than party i in achieving the output target compared to public spending, then $\frac{\delta_j}{\gamma_j} > \frac{\delta_i}{\gamma_i}$.⁴

In order to study the effects of the introduction of a second policy (fiscal policy) and an independent central bank responsible for monetary policy, we will consider two cases: first, when monetary policy is controlled by the government, and second, when such policy is delegated to an independent authority (central bank). The first case will represent an economy with no (or very little) central bank independence, whereas the second case will refer to an economy that has granted independence to its central bank for the conduct of monetary policy. In both cases, the timing of events is as follows: expectations and thus, wages, are set first. Afterwards, elections take place; party L wins with probability P , and party R with probability $1 - P$ (where the probability P is exogenous). After the election, the shock ε occurs. Finally, with no delegation, the government chooses both policies. In the case of delegation, the government and the central bank will choose their policies simultaneously. In what follows it is important to point out that the inflation expectation embodies electoral uncertainty: $\pi^e = PE(\pi_L) + (1 - P)E(\pi_R)$.

2.1 No independent monetary policy

In the absence of delegation (or with a fully dependent central bank), the party in government will attempt to minimise its loss function by using two instruments, π and τ . The policies chosen by the two parties if in office and the corresponding outputs immediately after the elections are (where the superscript N indicates no delegation):⁵

$$\begin{aligned}\pi_L^N &= \frac{m_R + 2}{(m_L + 2)(m_R + 1) + P(m_L - m_R)}A - \frac{\varepsilon}{m_L + 2}, \\ \pi_R^N &= \frac{m_L + 2}{(m_L + 2)(m_R + 1) + P(m_L - m_R)}A - \frac{\varepsilon}{m_R + 2},\end{aligned}$$

public spending is higher for party R . Notice that 1 is the weight attributed to inflation in the loss function of parties. In models with only one policy, it is assumed that $\delta_L > \delta_R$ -see, for instance, Alesina (1987) and Alesina and Gatti (1995), and thus in this case $m_L = 1/\delta_L$ and $m_R = 1/\delta_R$, which would correspond to $m_R > m_L$.

⁴As stated before, in models with only one policy, it is assumed that $\delta_L > \delta_R$. However, even though $\delta_L > \delta_R$, it is possible to have either $\frac{\delta_L}{\gamma_L} > \frac{\delta_R}{\gamma_R}$ or $\frac{\delta_L}{\gamma_L} < \frac{\delta_R}{\gamma_R}$.

⁵A detailed derivation of these expressions is included in the Appendix (see Proposition A.1).

$$\begin{aligned}
\tau_L^N &= g^* - \left(1 + \frac{1}{2\gamma_L}\right) \pi_L^N, \\
\tau_R^N &= g^* - \left(1 + \frac{1}{2\gamma_R}\right) \pi_R^N, \\
x_L^N &= x^* - \frac{1}{2\delta_L} \pi_L^N \text{ and} \\
x_R^N &= x^* - \frac{1}{2\delta_R} \pi_R^N,
\end{aligned}$$

where $A = x^* + g^* + w^*$.

These expressions show the equilibrium values of the main variables in an election year. These values will also be useful to find the non-election outcomes. Notice that the optimal values are functions of P . Non-election periods correspond to the case of no uncertainty: when $P = 1$, a left wing government is in power, and when $P = 0$ a right wing one is. For instance, $E(\pi_R^N)(P = 0)$ would correspond to the expected inflation rate in a non-election year in which party R is in office, whereas $E(\pi_L^N)(P = 1)$ would correspond to the expected inflation rate in a non-election year in which party L is in office.

Alesina (1987), in a model with only monetary policy controlled by the party in office, finds that inflation is always higher during an L administration compared to an R administration. In our model, if party R is more inflation averse than party L ($m_R > m_L$), we obtain the same result in expected terms.

Proposition 1: *Whenever $m_R > m_L$,*

- a) in an election year $E(\pi_L^N) > E(\pi_R^N)$, and*
- b) in a non election year $E(\pi_L^N)(P = 1) > E(\pi_R^N)(P = 0)$.*

Alesina's model did not include shocks and, therefore, the objective of minimising the value of inflation coincides with the objective of stabilising inflation. In our model, having included the shock ε , this equivalence might not hold. Nevertheless, it is shown in the Appendix, under Corollary A.2, that: $E((\pi_L^N)^2) > E((\pi_R^N)^2)$ whenever $m_R > m_L$. Consequently, this confirms that the measure proposed indicating the degree of importance given by each party to the goal of inflation stabilisation (m_j) is effectively measuring each party's inflation aversion.

Next, we focus on the comparison of expected outputs. Alesina (1987) obtains that, in an election year, output growth is above the natural level when party L wins, and it is below this level when party R wins. This differential effect on output is a consequence of the presence of policy surprises due to unexpected inflation. In a non-election year, as there are no policy surprises, output growth under both parties would coincide at the natural level. Our model differs from Alesina's in that there is another policy instrument, the tax rate, which introduces a distortion. This has three effects on our results which are shown in the next proposition: 1) expected output growth is always below the target of the output growth rate, 2) expected growth is not always higher under a

party L victory and 3) in a non-election year, the expected output rates do not coincide.

Proposition 2:

a) In an election year $x^* > E(x_L^N) > E(x_R^N)$ if and only if $\frac{\delta_L}{\delta_R} > \frac{m_R+2}{m_L+2}$, and

b) In a non-election year $x^* > E(x_L^N)(P = 1) > E(x_R^N)(P = 0)$ if and only if $\frac{\delta_L}{\delta_R} > \frac{m_R+1}{m_L+1}$.

This proposition indicates that the comparison between the expected output growth rate depends on the value of the ratio $\frac{\delta_L}{\delta_R}$. A high value of this ratio means that party L is much more concerned about output stabilisation than party R . In this case we expect a lower deviation of output when party L is in office. In addition, notice that $\frac{m_R+1}{m_L+1} > \frac{m_R+2}{m_L+2}$ whenever $m_R > m_L$.

The following graph summarizes the distribution of expected outputs when $m_R > m_L$:

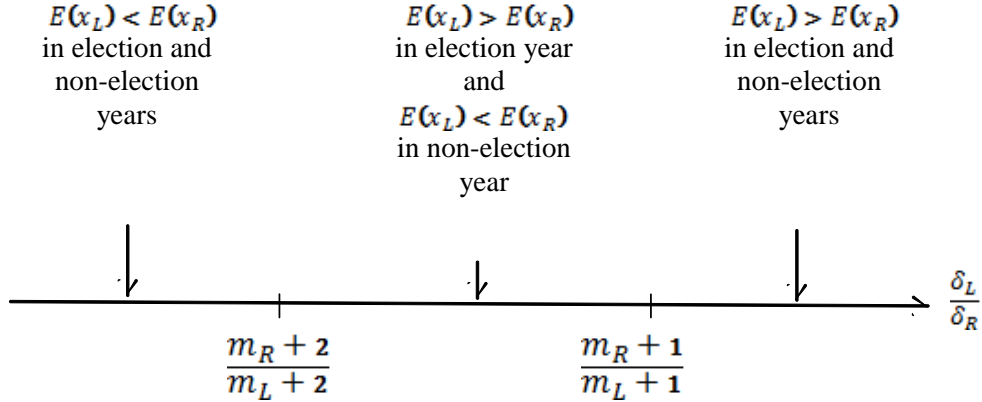


Figure 1. Distribution of expected outputs in election and non-election years when party R is more inflation averse than party L .

According to Figure 1, there are more parameter configurations for which the expected output growth when party L is in office is higher in an election period than in a non-election period. The economic intuition of this result is as follows. In our model, in an election year, there are two effects that affect the relationship between $E(x_L^N)$ and $E(x_R^N)$: one is due to the taxes raised by the parties, the other one is due to the inflation surprise. In a non-election year, similarly to Alesina's model, the latter effect disappears. With respect to the inflation surprise, whenever $m_R > m_L$, the difference between $E(\pi_L^N)$ and π^e will be positive, thus increasing $E(x_L^N)$; the difference between $E(\pi_R^N)$ and π^e will be negative, decreasing $E(x_R^N)$. This will favour the cases where $E(x_L^N) > E(x_R^N)$ in an election period.

The results presented above differ from the traditional RPT ones. For this reason, we selected a few countries in order to provide an illustrative example. We looked at the outcomes of elections for OECD countries during the 1980s, a period in which the wave of central bank independence had not yet arrived. We focused on countries that experienced a government shift from one party to another one in that period, and on countries whose central bank independence was relatively low.⁶ The following table shows inflation and output growth rates by party on the year that there is an election (t) and the year after ($t+1$) for some selected countries:

| Country | | t | $t+1$ | t | $t+1$ |
|-------------|--------------|-------|-------|-------|-------|
| | | π | π | x | x |
| Sweden | Left (1988) | 6,6% | 6,2% | 2,7% | 2,8% |
| | Right (1991) | 5,3% | 4,2% | -1,1% | -1,2% |
| New Zealand | Left (1987) | 15,8% | 6,35% | 1,7% | 0,3% |
| | Right (1990) | 6,1% | 2,6% | 0,1% | -1,7% |
| Canada | Left (1980) | 10,2% | 12,5% | 2,2% | 3,5% |
| | Right (1984) | 4,3% | 3,95% | 5,8% | 4,8% |

Table 1. Inflation and output growth rate by party on election year and the year after during 1980s and beginning of 1990s.

Alesina’s model predicts higher inflation rates with a left wing party in both an electoral and a non-electoral year. His model also predicts higher output rates when a left wing party wins the elections, but in non election years output rates should coincide. The data for Sweden and New Zealand would be in accordance with Alesina’s model, except for the last column, which shows different output growth rates. The introduction of fiscal policy in our model allows for outputs to differ in both election and non-election years.

Canada’s data do not seem to fit Alesinas’s model. However, our model can provide an explanation for this country. The fact that inflation under party L is higher indicates that $m_R > m_L$. As output is higher under party R in Canada both in an election year and after, it would be indicating that $\frac{\delta_L}{\delta_R} < \frac{m_R+2}{m_L+2}$.

Obviously, the model presented here assumes that the party’s preferences ($\delta_j, \gamma_j, x^*, g^*$) do not vary over time. It is, however, very likely that changes in the government’s preferences occur once a party is in power, due to economic factors and/or political ones.⁷ Further, the presence of shocks (for instance,

⁶For instance, Crowe and Meade (2007) report a measure of central bank independence for the period 1980-1989 of 0,29 for Sweden, 0,24 for New Zealand and 0,45 for Canada. The index is between 0 (no independence) and 1 (full independence). The data on inflation and output have been taken from the IMF World Economic Outlook Database. The parties are classified according to the Database of Political Institutions as Right (1), Centre (2) and Left (3). We only considered changes from 1 to 3 (Left wing party takes office) and 3 to 1 (Right wing party takes office).

⁷In fact, the 80s and early 90s, like in many periods in history, witnessed a few changes in preferences. For instance, the French socialist government elected in 1981 introduced a program of social and economic reforms that was dramatically turned around in 1983. A few years after, in 1986, the first cohabitation occurred: the socialist president Mitterrand was

in the form of economic recessions and expansions) would also alter the results presented in this section.⁸

2.2 Monetary policy delegated to an independent central bank

We will now study the case where monetary policy is undertaken by an independent monetary authority. In this case, the loss function of the independent central bank or monetary authority will be

$$V_{CB} = \frac{1}{2} \left(\pi^2 + \delta_{CB} (x - x^*)^2 + \gamma_{CB} (g - g^*)^2 \right), \quad (4)$$

where $\delta_{CB} > 0$ and $\gamma_{CB} \geq 0$. We follow Dixit and Lambertini (2003), who claim that, with discretionary policies, monetary and fiscal authorities should be assigned identical goals. However, the relative weights attributed to output and public expenditure with respect to inflation will differ.

The timing of the events is the same as in the previous case, with the only difference that after the shock ε occurs, the central bank will use its instrument (π) to minimise its loss function (4), and the party in government will attempt to minimise its loss function (3) by using the instrument τ . With this institutional specialisation we obtain the following optimal policy rules and outputs (where superscript D indicates delegation):⁹

$$\begin{aligned} \pi_L^D &= \frac{c_R m_R + 2}{(c_L m_L + 2)(c_R m_R + 1) + P(c_L m_L - c_R m_R)} A - \frac{\varepsilon}{c_L m_L + 2}, \\ \pi_R^D &= \frac{c_L m_L + 2}{(c_L m_L + 2)(c_R m_R + 1) + P(c_L m_L - c_R m_R)} A - \frac{\varepsilon}{c_R m_R + 2}, \\ \tau_L^D &= g^* - \left(1 + \frac{c_L}{2\gamma_L} \right) \pi_L^D, \\ \tau_R^D &= g^* - \left(1 + \frac{c_R}{2\gamma_R} \right) \pi_R^D, \\ x_L^D &= x^* - \frac{c_L}{2\delta_L} \pi_L^D \text{ and} \\ x_R^D &= x^* - \frac{c_R}{2\delta_R} \pi_R^D, \end{aligned}$$

forced to nominate the conservative primer minister Jacques Chirac. In Norway, the centre-right governments gained power in 1985 and 1989 but were toppled by the labour party in 1986 and 1990. Japan also saw its coalition of 1983 undergo troubled times in 1984. Austria too saw its coalition of 1983 break down in 1986.

⁸For this reason we have not considered data from elections around 1992, given the generalised slowdown experienced at that time. This meant that we could not include the US, as the changeover from republicans to democrats took place in the elections of 1992. Further, it could be argued that during this time the Federal Reserve already had substantial independence: the central bank independence index according to Crowe and Meade (2007) was 0,48 for the period 1980-1989, the same as in the 2000s.

⁹A detailed derivation of these expressions is included in the Appendix (see Proposition A.3).

where

$$c_j = \frac{1}{\frac{\delta_{CB} + \gamma_{CB}}{\delta_j + \gamma_j}},$$

with $j = L, R$.

Notice that c_j is a measure of the degree of the relative conservativeness of the central bank with respect to party j .¹⁰ In particular, when $c_j = 1$, the central bank and party j have the same degree of conservativeness, and when $c_j > 1$, the central bank is more conservative than party j .

Remark 1 *If $c_L = 1$ and $c_R = 1$, that is, the central bank is as conservative as both parties, then $\pi_j^D = \pi_j^N$ and $\tau_j^D = \tau_j^N$. Consequently, in this case we would obtain the same results as in the previous subsection under Propositions 1 and 2.*

Remark 2 *If $\frac{\delta_L}{\gamma_L} = \frac{\delta_R}{\gamma_R}$, that is, the two parties are identical in their relative interest in stabilising output over spending, then $\pi_L^D = \pi_R^D$ and $\tau_L^D = \tau_R^D$. To understand this result note that when $\frac{\delta_L}{\gamma_L} = \frac{\delta_R}{\gamma_R}$, the two parties solve the same optimisation problem and, consequently, there will be no difference in their behaviour. Taking into account this fact, the central bank sets the same inflation rate in this case.*

The following proposition provides the comparison of the expected values of the inflation rates when monetary policy has been delegated to an independent central bank:

Proposition 3: *Whenever $c_R m_R > c_L m_L$, or equivalently, whenever*

$$(\delta_{CB} - \gamma_{CB}) \left(\frac{\delta_L}{\gamma_L} - \frac{\delta_R}{\gamma_R} \right) < 0,$$

a) in an election year $E(\pi_L^D) > E(\pi_R^D)$, and

b) in a non-election year $E(\pi_L^N)(P = 1) > E(\pi_R^D)(P = 0)$.

In order to obtain Alesina's results on inflation, we need now the condition $(\delta_{CB} - \gamma_{CB}) \left(\frac{\delta_L}{\gamma_L} - \frac{\delta_R}{\gamma_R} \right) < 0$. In the literature, it is generally assumed that $\delta_{CB} > \gamma_{CB}$, i.e., the central bank prioritises output over public spending.¹¹ Then, the condition $\frac{\delta_L}{\gamma_L} < \frac{\delta_R}{\gamma_R}$ will be necessary and sufficient for expected inflation to be higher during an L administration. The logic behind this result is as follows. If party L is relatively less interested in stabilising output over

¹⁰Conservativeness refers to the degree of the central bank's inflation aversion. On the other hand, independence refers to the extent to which the central bank determines monetary policy without political interference. See Ferré and Manzano (2012) for a detailed explanation of the conservativeness measure c .

¹¹See, for instance, Alesina and Tabellini (1987), Debelle and Fisher (1994) or Beetsma and Bovenberg (1998).

spending than party R , $\left(\frac{\delta_L}{\gamma_L} < \frac{\delta_R}{\gamma_R}\right)$, it has more incentives to increase taxes, even though this lowers output. This has two effects on the behaviour of the central bank: on the one hand, taking into account the objective of output, the increase in taxes rises the incentives to inflate; on the other hand, given the objective of public spending, the increase in taxes lowers the incentives to inflate. Whenever $\delta_{CB} > \gamma_{CB}$, the first effect dominates and, therefore, the overall effect is that the central bank has more incentive to inflate, and therefore, $E(\pi_L^D) > E(\pi_R^D)$. However, when $\frac{\delta_L}{\gamma_L} > \frac{\delta_R}{\gamma_R}$, the opposite would be true, and then $E(\pi_L^D) < E(\pi_R^D)$, that is, expected inflation would be higher when a right wing party is in office, contradicting the traditional rational partisan results.

If we turn now to the comparison of expected output growth rates in the presence of an independent central bank, we obtain the following result:

Proposition 4: *Whenever $\frac{\delta_L}{\gamma_L} > \frac{\delta_R}{\gamma_R}$,*

- a) In an election year $x^* > E(x_L^D) > E(x_R^D)$, and*
- b) In a non election year $x^* > E(x_L^D)(P = 1) > E(x_R^D)(P = 0)$.*

Notice that, in contrast to Proposition 2, Proposition 4 involves the same condition for an election year and a non-election year. This implies that the presence of a central bank is rendering the effect of the inflation surprise in the election year meaningless. Therefore, the only effect that matters both in an election year and in a non-election year is the sign of $\frac{\delta_L}{\gamma_L} - \frac{\delta_R}{\gamma_R}$, that is, what party gives more relative weight to output stabilisation with respect to spending.

Further, according to Proposition 3, whenever $\delta_{CB} > \gamma_{CB}$, it was necessary that $\frac{\delta_L}{\gamma_L} < \frac{\delta_R}{\gamma_R}$ for expected inflation to be higher under an L administration. Now, according to Proposition 4, this condition will imply that $E(x_L^D) < E(x_R^D)$. Therefore, Propositions 3 and 4 indicate that, in the presence of an independent central bank responsible for monetary policy, the expected signs for inflation and output growth are the opposite, altering the traditional rational partisan theory results.

We will now present some data for OECD countries from the second half of the 1990s and beginning of 2000s, when central bank independence became generalised. We present data for the US, Sweden and France, where a government alternated between a left and a right wing party, and there is substantial central bank independence.¹² The following table shows inflation and output rates by party on the year that there is an election (t) and the year after ($t+1$) for some countries:¹³

¹²Crowe and Meade (2007) provide a measure of central bank independence for the US, Sweden and France of 0,48, 0,85 and 0,83, respectively, for 2003. The two most independent institutions in their sample were the European Central Bank and Sweden's Riksbank. The Federal Reserve score, which might look low, has not changed since the 1980s because its central bank law has not been amended.

¹³It is important to point out that as elections in US take place in November, expectations formed by the agents previously would affect the data of the year of elections, whereas the policies undertaken by the winning party would start in January. For this reason, for this

| Country | | t | $t+1$ | t | $t+1$ |
|---------------|--------------|-------|-------|------|-------|
| | | π | π | x | x |
| United States | Left (1996) | 2,3% | 1,5% | 4,5% | 4,4% |
| | Right (2000) | 2,8% | 1,6% | 1,1% | 1,8% |
| Sweden | Left (2002) | 1,9% | 2,3% | 2,5% | 2,5% |
| | Right (2006) | 1,5% | 1,7% | 4,6% | 3,4% |
| France | Left (1997) | 1,3% | 0,7% | 2,2% | 3,4% |
| | Right (2002) | 1,9% | 2,2% | 0,9% | 0,9% |

Table 2. Inflation and output growth rate by party on an election year and the year after during the second half of 1990s and early 2000s.

The data included in Table 2 would be giving support to our model: higher inflation is associated with a lower output. Concretely, for US and France the left wing party sets a lower inflation rate and a higher output, whereas the opposite result arises for Sweden. As it is generally assumed that the central bank gives priority to output over public spending stabilisation ($\delta_{CB} > \gamma_{CB}$), the data seems to suggest that $\frac{\delta_L}{\gamma_L} > \frac{\delta_R}{\gamma_R}$ for US and France, whereas $\frac{\delta_L}{\gamma_L} < \frac{\delta_R}{\gamma_R}$ for Sweden.¹⁴

3 Conclusions

The empirical evidence testing the validity of the economic implications of the rational partisan theory has been mixed. Our argument, developed in this article, is that the inclusion of other macroeconomic policies (like fiscal policy) and the presence of independent central banks in charge of monetary policy can partly contribute to explain this empirical inconclusiveness. This article illustrates that the implications of RPT can be altered significantly.

We extend the model of Alesina (1987) by including fiscal policy, and we propose an indicator of the inflation aversion for each party. We show that this measure is effective, as a higher inflation rate is expected when the party with the lower indicator is in office. Additionally, we prove that the direct relationship between the inflation rate and output derived in Alesina's framework may not hold in a more general setup with more than one policy. In particular, additional conditions will be required to guarantee that the output growth rate (in expected terms) is higher when the left-wing party is in office.

Given that monetary and fiscal policies are set in most industrial countries by two authorities that are (at least partly) independent and have different objectives, we extend the analysis to consider what happens when monetary

country we have considered the data of the election year from the year after elections take place (i.e., 1997 and 2001).

¹⁴For instance, it could be argued that γ_L was large in Sweden under the social democrat party in power until 2006, as it undertook important cuts in order to bring the budget deficit under control. In the US, it could be argued that γ_R was large, as per capita spending growth was much faster under the Republican administration of George W. Bush than it was under Democratic President Bill Clinton (see <http://www.project-syndicate.org/commentary/us-government-spending-and-economic-recovery-by-laura-tyson/#B4hwsopeMM9doetE.99>).

policy is chosen by an independent central bank. The results obtained in this new setup differ substantially from Alesina's (1987) results. Concretely, we show that the weights attributed to output stabilisation and public spending stabilisation will ultimately determine the rational partisan effects on inflation and output. Moreover, when the central bank prioritises output over public spending (an assumption made by many papers in this literature), then the direct relationship between inflation and output derived in Alesina (1987) never holds.

In this article we contribute to explaining the mixed empirical evidence obtained by the literature on rational partisan theory. Of course, some potentially relevant considerations are not covered by the analysis provided in this article and could significantly alter the results presented. For example, changes in the preferences once a party is in power or a predominance of the terms affected by the shocks would bring realisations of the variables that would not follow the predictions of our model.

Appendix

Proposition A.1: The policies chosen by the two parties, if in office, under non-delegation are given by

$$\begin{aligned}\pi_L^N &= \frac{m_R + 2}{(m_L + 2)(m_R + 1) + P(m_L - m_R)}A - \frac{\varepsilon}{m_L + 2}, \\ \pi_R^N &= \frac{m_L + 2}{(m_L + 2)(m_R + 1) + P(m_L - m_R)}A - \frac{\varepsilon}{m_R + 2}, \\ \tau_L^N &= g^* - \left(1 + \frac{1}{2\gamma_L}\right)\pi_L^N \text{ and} \\ \tau_R^N &= g^* - \left(1 + \frac{1}{2\gamma_R}\right)\pi_R^N.\end{aligned}$$

Proof of Proposition A.1: Under non-delegation,¹⁵ the party in office, denoted by j , chooses π and τ in order to solve the following optimisation problem:

$$\min_{\pi, \tau} V_{Gj} = \frac{1}{2} \left(\pi^2 + \delta_j (x - x^*)^2 + \gamma_j^2 (g - g^*) \right).$$

The first order conditions (f.o.c.) of this optimisation problem are given by¹⁶

$$\begin{aligned}\frac{\partial}{\partial \pi} V_{Gj} &= \pi + \delta_j (x - x^*) + \gamma_j (g - g^*) = 0 \text{ and} \\ \frac{\partial}{\partial \tau} V_{Gj} &= -\delta_j (x - x^*) + \gamma_j (g - g^*) = 0.\end{aligned}$$

Using the Expressions (1) and (2) in the previous two equalities, it follows that

$$\pi_j = \frac{1}{m_j + 2} (\pi^e + A - \varepsilon) \text{ and} \tag{5}$$

$$\tau_j = g^* - \frac{\delta_j (2\gamma_j + 1)}{\gamma_j + \delta_j + 4\gamma_j \delta_j} (\pi^e + A - \varepsilon), \tag{6}$$

where

$$\begin{aligned}m_j &= \frac{\frac{1}{\delta_j} + \frac{1}{\gamma_j}}{2} \text{ and} \\ A &= g^* + w^* + x^*.\end{aligned}$$

¹⁵To ease the analysis, we drop the superscript N in this proof.

¹⁶Direct computations yield that the objective function is strictly convex. Therefore, the first order conditions are necessary and sufficient to obtain a minimum. The same comment applies for the remainder optimisation problems.

Rewriting (5) for the two parties, we have

$$\begin{aligned}\pi_L &= \frac{1}{m_L + 2} (\pi^e + A - \varepsilon) \text{ and} \\ \pi_R &= \frac{1}{m_R + 2} (\pi^e + A - \varepsilon).\end{aligned}$$

Recall that $\pi^e = PE(\pi_L) + (1-P)E(\pi_R)$. Taking expectations in the previous expressions and solving for π^e , we get

$$\pi^e = \frac{P \frac{1}{m_L+2} + (1-P) \frac{1}{m_R+2}}{1 - \left(P \frac{1}{m_L+2} + (1-P) \frac{1}{m_R+2} \right)} A. \quad (7)$$

Substituting this expression into (5) and (6) for $j = L, R$, and after some algebra, we obtain the expressions for π_L, π_R, τ_L and τ_R included in the statement of this proposition. ■

Corollary A.2: $E((\pi_L^N)^2) > E((\pi_R^N)^2)$ whenever $m_R > m_L$.

Proof of Corollary A.2: Recall that $E((\pi_L^N)^2) = (E(\pi_L^N))^2 + \text{var}(\pi_L^N)$. Using the expression of π_L^N , we have that

$$\begin{aligned}E(\pi_L^N) &= \frac{m_R + 2}{(m_L + 2)(m_R + 1) + P(m_L - m_R)} A \text{ and} \\ \text{var}(\pi_L^N) &= \left(\frac{1}{m_L + 2} \right)^2 \sigma_\varepsilon^2.\end{aligned}$$

Hence, $E((\pi_L^N)^2) = \left(\frac{m_R + 2}{(m_L + 2)(m_R + 1) + P(m_L - m_R)} A \right)^2 + \left(\frac{1}{m_L + 2} \right)^2 \sigma_\varepsilon^2$. Analogously, we obtain that $E((\pi_R^N)^2) = \left(\frac{m_L + 2}{(m_L + 2)(m_R + 1) + P(m_L - m_R)} A \right)^2 + \left(\frac{1}{m_R + 2} \right)^2 \sigma_\varepsilon^2$. Direct computations yield

$$E((\pi_L^N)^2) - E((\pi_R^N)^2) = (m_R - m_L)(m_L + m_R + 4) \times C,$$

with

$$C = \left(\frac{A^2}{((m_L + 2)(m_R + 1) + P(m_L - m_R))^2} + \frac{\sigma_\varepsilon^2}{(m_R + 2)^2 (m_L + 2)^2} \right).$$

Consequently, $E((\pi_L^N)^2) > E((\pi_R^N)^2)$ whenever $m_R > m_L$. ■

Proposition A.3: Under delegation, the policies chosen by the central bank and the party, if in office, are given by

$$\begin{aligned}\pi_L^D &= \frac{c_R m_R + 2}{(c_L m_L + 2)(c_R m_R + 1) + P(c_L m_L - c_R m_R)} A - \frac{\varepsilon}{c_L m_L + 2}, \\ \pi_R^D &= \frac{c_L m_L + 2}{(c_L m_L + 2)(c_R m_R + 1) + P(c_L m_L - c_R m_R)} A - \frac{\varepsilon}{c_R m_R + 2}, \\ \tau_L^D &= g^* - \left(1 + \frac{c_L}{2\gamma_L}\right) \pi_L^D \text{ and} \\ \tau_R^D &= g^* - \left(1 + \frac{c_R}{2\gamma_R}\right) \pi_R^D.\end{aligned}$$

Proof of Proposition A.3: Under delegation,¹⁷ the central bank chooses π in order to solve the following optimisation problem:

$$\min_{\pi} V_{CB} = \frac{1}{2} \left(\pi^2 + \delta_{CB} (x - x^*)^2 + \gamma_{CB} (g - g^*)^2 \right).$$

The first order condition (f.o.c.) of this optimisation problem is given by

$$\frac{\partial}{\partial \pi} V_{CB} = \pi + \delta_{CB} (x - x^*) + \gamma_{CB} (g - g^*) = 0.$$

In this setup the party in office, denoted by j , chooses τ in order to solve the following optimisation problem:

$$\min_{\tau} V_{G_j} = \frac{1}{2} \left(\pi^2 + \delta_j (x - x^*)^2 + \gamma_j (g - g^*)^2 \right).$$

The first order condition (f.o.c.) of this optimisation problem is given by

$$\frac{\partial}{\partial \tau} V_{G_j} = -\delta_j (x - x^*) + \gamma_j (g - g^*) = 0.$$

Using the expressions (1) and (2) in the f.o.c. of the authorities' problems, and after some algebra, it follows that

$$\pi_j = \frac{\gamma_j \delta_{CB} + \delta_j \gamma_{CB}}{\gamma_j + \delta_j + 2\gamma_j \delta_{CB} + 2\delta_j \gamma_{CB}} (\pi^e + A - \varepsilon) \text{ and} \quad (8)$$

$$\tau_j = g^* - \frac{\delta_j + \gamma_j \delta_{CB} + \delta_j \gamma_{CB}}{\gamma_j + \delta_j + 2\gamma_j \delta_{CB} + 2\delta_j \gamma_{CB}} (\pi^e + A - \varepsilon). \quad (9)$$

Rewriting (8) for the two parties, we have

$$\begin{aligned}\pi_L &= \frac{\gamma_L \delta_{CB} + \delta_L \gamma_{CB}}{\gamma_L + \delta_L + 2\gamma_L \delta_{CB} + 2\delta_L \gamma_{CB}} (\pi^e + A - \varepsilon) \text{ and} \\ \pi_R &= \frac{\gamma_R \delta_{CB} + \delta_R \gamma_{CB}}{\gamma_R + \delta_R + 2\gamma_R \delta_{CB} + 2\delta_R \gamma_{CB}} (\pi^e + A - \varepsilon).\end{aligned}$$

¹⁷ Again to simplify the notation, we drop the superscript D in this proof.

Using the expressions for c_L and c_R , we get

$$\delta_{CB}\gamma_L + \gamma_{CB}\delta_L = \frac{2\delta_L\gamma_L}{c_L} \text{ and } \delta_{CB}\gamma_R + \gamma_{CB}\delta_R = \frac{2\delta_R\gamma_R}{c_R}.$$

Hence,

$$\begin{aligned} \pi_L &= \frac{1}{c_L m_L + 2} (\pi^e + A - \varepsilon) \text{ and} \\ \pi_R &= \frac{1}{c_R m_R + 2} (\pi^e + A - \varepsilon). \end{aligned}$$

Again recall that $\pi^e = PE(\pi_L) + (1 - P)E(\pi_R)$. Taking expectations in the previous expressions and solving for π^e , we get

$$\pi^e = \frac{P \left(\frac{1}{c_L m_L + 2} \right) + (1 - P) \left(\frac{1}{c_R m_R + 2} \right)}{1 - \left(P \frac{1}{c_L m_L + 2} + (1 - P) \left(\frac{1}{c_R m_R + 2} \right) \right)} A.$$

Substituting this expression into (8) and (9) for $j = L, R$, and after some algebra, we obtain the expressions for π_L , π_R , τ_L and τ_R included in the statement of this proposition. ■

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