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Who Creates Political Business Cycles? (Should Central Banks Be Blamed?)

Erik Leertouwer and Philipp Maier*

1st December 1999

Abstract

Little attention has been paid in most economic studies on political business cycles to separate the effects of fiscal and monetary policy. We attempt to assess the effect of monetary policy in a panel model for 16 OECD countries. To answer the question whether central banks actively create political business cycles we focus on the short-term interest rate as a proxy for the use of monetary instruments. Our results indicate that central banks should not be blamed for creating political business cycles as we do not find any evidence for cyclical behavior in the short-term interest rate. This conclusion holds no matter whether central banks are independent or not or are constrained by the exchange rate system in force.

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1. Introduction

There are mainly two reasons why central banks are made independent. First, it reduces the inflationary bias. Many empirical studies provide evidence for that.[1] Second, "the most obvious advantage a fully independent central bank has is that of not being influenced by electoral deadlines" (Muscatelli, 1998). That the incumbent government may be inclined to stimulate the economy before elections to enhance re-election probabilities is well-known.[2] Are central banks also influenced by electoral deadlines? Put differently, if we observe political business cycles (PBCs) in macroeconomic variables such as unemployment and the growth rate, who is responsible for creating them – and who should not be blamed?

Surprisingly, the empirical literature has little to say about the exact role of governments and central banks when it comes to PBCs. Worse, in most previous studies different institutional features have largely been neglected. In many economies the scope for electorally-motivated monetary policies is reduced, since national or international restrictions bind central bankers. In a regime of fixed exchange rates, for example, opportunistic policies are less likely to occur than in a flexible exchange rate system. Similarly, independent central banks are less likely to be involved in electorally motivated policies than central banks that are under the spell of the government. The restricting effects of these institutional features are recognized in economic theory, yet many empirical papers on political business cycles do not explicitly control for them.

Indeed, Clark et al. (1998) argue that common cross-country studies of PBC models may be seriously flawed since they do not account for institutional differences that constrain national policymakers.[3] However, these authors only examine economic outcomes (output growth and unemployment). Although these variables are likely to be influenced by monetary policy, there are a number of other influences that may offset or reinforce the impact of monetary policy. Furthermore, the rational political business cycle predicts that policymakers manipulate instruments while the effects on outcomes are less certain. This paper tends to fill this gap by focusing on policy outcomes for which the central bank can be held responsible, namely the short-term interest rate. Thereby we also wish to answer the question of whether the central bank can be blamed for active opportunistic behavior. Our sample runs from the 1960s until

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1 See Eijffinger and de Haan (1996) for an overview. Posen (1998), however, challenges this view by providing evidence that a higher degree of central bank independence does not reduce disinflation costs.

2 See Alesina, Roubini and Cohen (1997) for an overview.

3 Clark and Hallerberg (1998) formulate this idea in terms of a theoretical model.

1997 and consists of monthly data for 16 OECD countries. The results are simple and strikingly robust. With the possible exception of Austria, the short-term interest rate does not show any sign of a political business cycle. Thus we reject the hypothesis that central banks actively engage in opportunistic behavior.

The outline of the paper is as follows. In the next section, we explain the political business models in more detail and show why internal or external constraints can prevent politicians from using monetary policy for short-sighted purposes. Our estimation results will be presented in section 3, in section 4 we summarize our findings.

2. When Do Political Business Cycles Occur?

2.1 Electoral Pressure On The Economy

A test for the existence of political business cycles requires the following. First, we need a theoretical basis to explain why such short-sighted behavior could be pursued by the government or the central bank. Second, one has to account for restricting institutional features that limit the possibility to implement such a policy. And finally, we need an appropriate measure for the central bank's policy stance.

2.1.1 The Theoretical Framework

The first model on political business cycles was developed by Nordhaus (1975). It is based on the assumptions that politicians care only about their re-election and voters judge the incumbent's performance by the state of the economy. The economy is characterized by an exploitable Phillips-curve and the incumbent can directly control the rate of inflation. Nordhaus assumed that the government was responsible for both monetary and fiscal policy.

Under the assumption of adaptive or non-rational expectations, the incumbent government has an incentive to pursue expansive economic policies before elections to enhance its probability of re-election by lowering the unemployment rate. After elections, the government has to fight inflation with contractionary monetary policies, thereby raising the unemployment rate, before switching to expansionary policies again as the next election approaches. Due to the poor memory of the voters, this cycle might be repeated endlessly.

Such behavior is called 'opportunistic'. The testable prediction of the model is that before elections the unemployment rate drops due to expansive policies, while after elections inflation is high and contractionary measures are taken. Similar patterns apply to economic instruments.

A common criticism concerned the assumption of adaptive expectations. This has led to a reformulation of the model by Rogoff and Sibert (1987) who expanded the framework to a 'rational political business cycle model' (RPBC). They assume that voters lack information about the competence of the politicians and in order to appear 'competent', policymakers manipulate policy instruments. The RPBC model predicts visible cycles in economic instruments, and short, possibly irregular cycles ('blips') in economic outcomes such as the inflation rate or the unemployment rate.

2.1.2 Restricting Institutional Features

The models described make the simplifying assumptions that (a) the central bank and the government pursue the similar policies, and (b) policymakers have sufficient national autonomy to implement their policies. Both assumptions need not hold in reality, as the following two types of constraints may prevent governments from implementing an opportunistic policy:

National Constraint If we assume that the central bank enjoys a low degree of statutory independence, then it is likely that pressure is applied such that monetary policy follows the opportunistic pattern set by fiscal policy. In this case, electoral cycles may be observed in monetary instruments. However, central banks are increasingly made independent. If we abstract from the idea that central banks have their own interests, due to which they prefer one government over another, then one should not expect them to engage in opportunistic behavior.[4] After all, one of the main arguments for making them independent is that this enables their optimization to be based on a longer time-horizon, which rules out short-sighted behavior. Still, even for central banks with a high degree of statutory independence it might be rational to comply to the government's wishes, as its independence might be threatened by a change in the central bank law. If this is realized by the central bank, then independent as well as dependent central banks have an incentive to engage in PBC behavior.[5]

International Constraint From economic theory we know that under a regime of fixed exchange rates and high capital mobility, the scope for autonomous economic policies is reduced. Since the worldwide increase in capital mobility in the 70s we can thus assume that the possibility to implement a national mon-

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4 In Vaubel (1993) it is assumed that the central bank follows its own interests.

5 This argument has been put forward by Frey and Schneider (1981) and Berger and Schneider (1999).

etary policy has declined for those countries who have either been member of a fixed exchange rate regime (such as the Bretton Woods system or the European Monetary system EMS), or who have pegged their currency unilaterally. Participation in a fixed exchange rate regime, however, restricts national economic policies and lowers the possibility of PBCs.

2.1.3 Measuring Monetary Policy

Still unsolved is the question how monetary policy should be measured. Clearly evidence in unemployment or growth rates cannot be solely attributed to the government or the central bank.[6] Previous studies on political business cycles in monetary policy have in most cases focused on monetary aggregates. Examples of this approach are Alesina, Roubini and Cohen (1997), Allen and McCrickard (1991), or Vaubel (1993), who all use M1.[7] A survey of evidence for the US can be found in de Haan and Gormley (1997). Still, a PBC in, say, M1, does not necessarily imply active central bank behavior: If, for instance, the incumbent government uses expansive fiscal policy before elections, and the central bank tolerates this behavior, then obviously a monetary aggregate must reflect pre-electoral manipulation.[8] However, it would be unfair to fully blame the central bank, as the PBC was created by the government. To answer the question of whether central banks regularly misuse monetary policy, evidence should be found in monetary instruments.[9]

There is, however, one problem. It is nearly impossible to determine a 'key variable' which fully characterizes the current monetary policy stance. For most countries, focusing on one single instrument is not possible, as the example of Germany shows. Different instruments were used over time, and the relative weight of these instruments changed considerably. Open market operations, for example, which were the most powerful monetary tool in the late 80s and 90s, were fully developed only in 1985. For most countries *the* monetary instrument does not exist.

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6 Examples of this approach include Alesina and Roubini (1992), Soh (1986) and the original paper from Nordhaus (1975).

7 M1 is commonly used due to data availability.

8 Berger and Woitek (1997a, 1997b) have looked at the German case. They find cycles in M1 which could indicate an opportunistic behavior of the Deutsche Bundesbank. However, their findings indicate that the Bundesbank did not target a monetary aggregate, but rather economic variables such as inflation or output. Therefore Berger and Woitek conclude that the cycle in M1 was demand-driven rather than supply-driven.

9 This has the additional advantage that the distinction between PBC and RPBC no longer matters: Both models predict cycles in policy instruments. Only under the assumption of non-rational expectations, however, these cycles translate into policy outcomes.

Still, there is a possibility to circumvent these problems. The direction of monetary policy is reflected in the behavior of interest rates, as monetary instruments either directly or indirectly influence interest rates. Therefore they could be viewed as capturing the 'net effect' or the 'sum' of all monetary instruments.[10]

There is a second argument why the choice of an interest rate might be appropriate. If politicians try to influence a central bank before elections, the demand will in most cases not be formulated in terms of a monetary aggregate ('Increase the growth rate of M1'), but in term of interest rates ('Lower the interest rate!').[11]

Goodhart (1994) provides additional support why researchers should focus on interest rates - and claims that interest rates are manipulated by politicians:

> "... those in charge of CBs generally regard monetary base control as a non-starter. The instrument which they can, and do, control is the short-term money market rate.
> Politicians ... suggest that an electorally inconvenient interest rate increase should be deferred, or a cut 'safely' accelerated. This political manipulation of interest rates .. leads to a loss of credibility..."[12]

Yet, so far only few researchers have actually tested whether this claimed influence on interest rates does indeed exist. In our paper we use short-term interest rates which are tightly controlled by the central banks and reflect their intentions.[13] Should political business cycles exist and should they be actively created by central banks, they should be visible in the short-term interest rates.

2.2 Institutional Constraints

2.2.1 National Constraints

To account for internal constraints, we first need to classify the degree of statutory central bank independence in the various countries. Usually this is done by setting up criteria to measure the degree of independence and assigning scores to the various countries. Both require subjective judgement and it comes as no surprise that different

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10 A similar view has been taken in Maier (1999).

11 This point has first been made by Johnson and Siklos (1994)., who used a short-term interest rate to estimate a VAR model.

12 Goodhart (1994), pp. 1426-27.

13 The German Bundesbank considers the day-to-day rate as 'key indicator' (Deutsche Bundesbank, 1995).

Australia	Austria	Belgium	Canada
+	+	-	+
Denmark	Finland	France	Germany
+	-	-	+
Italy	Japan	New Zealand	Norway
-	-	-	-
Spain	Sweden	United Kingdom	United States
-	-	-	+

Table 2.1: Presence National Constraints

authors have come up with different rankings.[14]

Here, we will primarily use the index developed by Cukierman et al. (CWN, 1992).[15] We divide the countries into two groups, those having scores above the median which we consider as 'independent central banks' and those with scores below the median ('dependent central banks'). This classification is reported in Table 2.1. Countries ranked above the median value are marked with '+' (i.e., internal constraints are present) and countries ranked below the median value with '-' (i.e. absence of internal constraints). We expect this classification to give a reliable overall ranking of the degree of statutory independence. In the '+' countries PBCs are not likely to occur in monetary policy, as these countries have an independent central bank. Countries with a '-' have a central bank with a low degree of statutory independence and if PBCs are to be found, we expect them there.

2.2.2 International constraints

From an economist's view, the 1970s marked a turning point in at least two respects: Since the 1970s international capital mobility increased sharply, and the Bretton Woods system of fixed exchange rates collapsed in 1973.[16]

To classify for each country in our sample those periods where it could determine its monetary policy in an entirely autonomous way we check its participation in a

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14 See Eijffinger and de Haan (1996) for an overview. Forder (1999) argues that ...'the difficulties in measuring independence have not been sufficiently overcome to allow persuasive or meaningful tests...'. See Forder (1999), p. 25

15 Note that the choice of the CBI measure is not crucial for our results. Indeed, we also ran estimates with other measures of statutory CBI, but as the CBI variable is never significant in our regressions this did not qualitatively change our implications.

16 See Clark et al. (1998), pp. 95-99.

fixed exchange rate regime. Our findings are summarized in Table 2.2[17]. The first column shows the participation in the Snake (the predecessor of the European Monetary System EMS), the second column shows the participation in the EMS and the third column gives the times during which a country pegged its currency.

The last column summarizes those periods where the countries could fully determine their monetary policy independently, i.e. monetary policy autonomy (MPA) has been present.[18]

Country	Snake	EMS	Pegged	MPA Present
Australia	-	-	-	Entire period
Austria	-	1995-98	1973-95	Before 1973
Belgium	1973-78	1979-98	-	Before 1973
Canada	-	-	-	Entire period
Denmark	1973-78	1979-98	-	Before 1973
Finland	-	1996-98	1977-96	Before 1977
France	Intermittent	1979-98	-	Before 1979
Germany	1973-78	1979-98	-	Before 1973, after 1979
Italy	-	Intermittent	-	Before 1979
Japan	-	-	-	Entire period
N. Zealand	-	-	1973-79	Before 1973, after 1979
Norway	1973-78	-	1979-98	Before 1973
Spain	-	1989-98	-	Before 1989
Sweden	1973-77	-	1977-98	Before 1973
UK	-	Intermittent	-	Before 1990
US	-	-	-	Entire period

Table 2.2: Presence International Constraints

2.2.3 Summary: National and International Constraints

Summarizing the above, Table 2.3 shows for each country the combination of both constraints. Note that only few countries experienced monetary policy autonomy for the entire period (the right column of Table 2.3; this, however, does not pose a problem as we find a lot of variation in the left part of the table. This should give us reliable estimates for MPA.

17 Source: Clark et al. (1998), own calculations.

18 Italy and the UK have left the EMS after the turmoil in 1992. Although not explicitly reported in this table, this is captured in their MPA dummies. Germany has been the anchor currency in the EMS. Therefore, we do not count the EMS as a binding restraint for German monetary policy.

National Constraint *CBI*	International Constraint For part of period	For entire period
Above Median	Austria, Denmark, Germany, UK (1960-71)	Australia, Canada, US
Below Median	Belgium, Finland, France Italy, New Zealand, Norway Spain, Sweden, UK (1972-98)	Japan

Table 2.3: National and International Constraints

In a regression analysis, we would therefore expect not to find PBC in countries that are constrained in either way. Clark et al. (1998) have shown this hypothesis to hold for policy outcomes, such as inflation or unemployment rates. However, this test cannot reveal the precise role of central banks, since these policy outcomes are influenced by many additional factors (e.g. supply and demand shocks). If we find cycles in policy outcomes, we cannot conclude that the central bank actively creates them.

To get comparable figures, we use monthly IFS data on the short-term interest rate for 16 OECD countries. The sample period starts for most countries in the 1960s and goes until 1997. Further details on the data can be found in appendix B.

3. The Results

3.1 Country-Specific Tests

To test our hypothesis, we divide the sixteen countries we consider into three different groups: countries experiencing no change in internal and external constraints during the period of observation, countries experiencing a change in the external constraint and countries experiencing a change in the internal constraint. For each of these groups we describe the appropriate model specification and give estimation results. For all country-specific tests that follow, the models include lagged dependent variables and lagged disturbances if necessary, the order of which is determined by examining the (partial) autocorrelation function and by performing a Breusch-Godfrey serial correlation LM test.[19] The model coefficients are estimated using OLS techniques.[20]

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19 The order of the lags is not reported in the tables.

20 The bias of the OLS estimator disappears since the number of time periods is large, see Kennedy (1998), p. 149-150.

3.1.1 No change in the constraints

The first country-specific test we apply seeks to examine whether a significant degree of covariation exists between elections and the short-term interest rate for countries experiencing no change in the internal and external constraint during the period of observation: Australia, Austria, Canada, Denmark, Germany, Japan and the United States. Following Alesina, Roubini and Cohen (1997), we start with the following first model specification:

$$I_{it} = \beta_{0i} + \beta_{1i} E_{it} + \sum_j \beta_{j+1,i} I_{i,t-j} + \epsilon_{it} \tag{1}$$

where I_{it} is the short-term interest rate and E_{it} the election dummy, which is defined as $+1$ in the month containing a general election and the eleven preceding months, and 0 otherwise.[21]

Three different cases are considered:

1. Cases having high levels of central bank independence and national policy autonomy for the entire period of observation: Australia, Canada, United States. For these countries political business cycles are quite unlikely.
2. Cases having high levels of central bank independence for the entire period but national policy autonomy for only part of the period of observation: Austria, Denmark, Germany. These countries are more likely to experience PBCs.
3. Cases having neither constraint during the period of observation: Japan. Here PBCs are most likely to be found.

The results for all three groups are shown in Table 3.1.[22] None of the countries for which we expect a PBC to occur yields a coefficient that is significant.[23] This is a clear sign that PBC are not visible in the short-term interest rate.

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21 We experimented with different election dummies. See Appendix A for additional estimation results.

22 The significance of the estimates is marked with the superindex ***/**/* if $p < 0.01/0.05/0.1$.

23 When interpreting these results, one must bear in mind that Japan is a special case: First, elections are endogenous in Japan, which means that the parliament has the ability to call elections when the ruling party experiences a favorable situation. Second, the Liberal Democratic Party (LDP) has maintained a majority in the House of Representatives (Lower House) and singularly ran the government from 1955 until July 1993 (see the Web-Server of the Liberal Democratic Party, http://www.jimin.or.jp/jimin/english/e-index.html, for details). Although the LDP has almost been an a sure winner, which usually provides little incentives for political business cycles, it nevertheless tried to maximize the winning margin. There is a broad consensus that elections are more likely to be held

Only Austria yields a negative coefficient which means that the interest rate decreases before elections. This behavior indicates a PBC, and the coefficient is significantly different from zero. This would mean that Austria, despite its relatively independent central bank, experiences a PBC.

Country	Coefficients	S.E.
1. High CBI, MPA for entire period present		
Australia	0.075	(0.089)
Canada	0.107	(0.158)
US	0.018	(0.095)
2. High CBI, shifting levels of MPA		
Austria	-0.165***	(0.058)
Denmark	0.058	(0.135)
Germany	-0.032	(0.065)
3. Countries with neither constraint		
Japan	0.070	(0.061)

Table 3.1: The effect of elections on the short-term interest rate

A series of robustness checks can be done.[24] We have added to all our estimated GNP growth and the inflation rate as explanatory variables.[25] Qualitatively, this did not change our results. We have also conducted all estimations with the real interest rate, which we proxied by subtracting the inflation rate from the short-term interest rate. Again, our conclusions did not change. Similar robustness checks have been conducted in all estimates.

3.1.2 Changes in the external constraint

Next, we consider the group of countries which experienced a change in the external constraint during the period of observation: Belgium, Finland, France, Italy, Norway, Spain, Sweden and New Zealand. These countries are faced with low levels of central bank independence and shifting levels of monetary policy autonomy.

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when economic conditions are favorable for the incumbent (see Ito and Park, 1988), which is difficult to capture in a common PBC model. See also Cargill et al. (1997) for more information on Japan.

24 See appendix A for results on robustness checks.

25 Growth rates have been estimated of the log of the raw series and detrended if necessary. All series were stationary.

In order to conduct country-specific tests, a dummy variable $NOMPA$ is added to model (1). This dummy has a value equal to +1 when a country lacks monetary policy autonomy. An additional dummy variable $E * NOMPA$ is included as interaction term, equaling +1 during electoral periods in countries lacking monetary policy autonomy. Thus, the model specification for countries experiencing shifting international constraints but no domestic constraint is the following:

$$\begin{aligned} I_{it} &= \beta_{0i} + \beta_{1i} E_{it} + \beta_{2i} NOMPA_{it} + \beta_{3i} E_{it} NOMPA_{it} \\ &\quad + \sum_j \beta_{j+3,i} I_{i,t-j} + \epsilon_{it} \end{aligned} \tag{2}$$

If our argument is correct that the absence of monetary policy autonomy decreases the probability that politicians will manipulate the macroeconomy for electoral purposes, we should expect the sum of the first and third coefficient not to be significantly different from zero. Therefore, a Wald test is performed to test for $\beta_1 + \beta_3 = 0$.

Country	β_1 E	S.E.	β_2 NOMPA	S.E.	β_3 E*NOMPA	S.E.	$\beta_1 + \beta_3$	F Wald
Belgium	-0.088	(0.156)	0.241*	(0.129)	0.184	(0.191)	0.096	0.751
Finland	0.071	(0.270)	-0.279*	(0.146)	-0.023	(0.296)	0.048	0.160
France	0.078	(0.125)	0.018	(0.091)	0.057	(0.167)	0.135	1.448
Italy	0.088	(0.119)	0.163*	(0.098)	-0.156	(0.170)	-0.068	0.315
Norway	0.568	(0.753)	0.072	(0.379)	-0.768	(0.768)	-0.200	2.154
Spain	0.583	(0.574)	-1.053*	(0.561)	0.039	(0.866)	0.622	0.883
Sweden	0.261	(0.233)	0.298*	(0.176)	-0.173	(0.267)	0.088	0.476
N.Zealand	0.028	(0.141)	-0.009	(0.156)	-0.007	(0.275)	0.021	0.008

Table 3.2: The effect of elections on the short-term interest rate in countries experiencing shifting international constraints, but no national constraint

The results are shown in Table 3.2. As can be seen from the table, the sum of the coefficients is not significantly different from zero for all eight countries. This can be interpreted in two ways: First, the absence of political business cycles in the short-term interest rate is due to the external constraint. Second, a close inspection of the table shows that the election dummy is never significant. This implies that PBCs never occurred in our sample at all, and that the additional test for the restriction was in fact superfluous.

For Belgium, Finland, Spain and Sweden the coefficient for the dummy $NOMPA$ is

significant. Still, a simple interpretation cannot be given. A positive value (in the case of Belgium and Sweden) indicates that during periods of flexible exchange rates these countries experienced higher interest rates, whereas in the case of Finland and Spain flexible exchange rates lowered the short-term interest rate significantly. Our results for Finland may suffer from data insufficiencies (only one election period covered during monetary policy autonomy), but still one would expect a clearer result whether flexible exchange rates tend to increase or to lower the short-term interest rate.

3.1.3 Changes in the internal constraint

So far we have not looked at Great Britain. Of the sixteen countries in our sample, it is a special case as it experienced a change in central bank independence.[26] This change is captured in our third model specification:

$$\begin{aligned} I_{it} &= \beta_{0i} + \beta_{1i} E_{it} + \beta_{2i} CBI_{it} + \beta_{3i} E_{it} CBI_{it} \\ &\quad + \sum_j \beta_{j+3,i} I_{i,t-j} + \epsilon_{it} \end{aligned} \tag{3}$$

The estimation results are shown in Table 3.3. We estimate two different settings: The left part of Table 3.3 estimates a pure PBC model, neglecting internal and external constraints. We see that the election dummy has the correct sign, but remains insignificant. The right column reports the results if we include the changing level of central bank independence. Once again, the coefficients remain insignificant, indicating that the Bank of England has not been very likely to engage in PBCs. The results are quite in line with the literature. Similar findings for the UK have been reported by Clark et al.

3.2 Panel Data estimation

By pooling the data, we can directly examine the effects of cross-national differences in the internal and external constraint. We use an autoregressive panel data model with fixed effects, in which the relevant parameters can be estimated using the LSDV

26 Great Britain experienced a change in central bank independence sufficiently large for the CWN index to place it below the median for one part of the period and above the median for the other part. In 1971 the Bank of England became less independent, which means that our CBI dummy for Great Britain is 0 from 1971 to 1997.

UK	Institutionally naive		Context dependent	
	Coefficient	S.E.	Coefficient	S.E.
$\beta_2 : E$	-0.047	(0.109)	-0.055	(0.132)
$\beta_3 : CBI$	-	-	-0.109	(0.123)
$\beta_4 : E * CBI$	-	-	0.014	(0.236)

Table 3.3: The effect of elections on the short-term interest rate in the UK under alternative specifications

estimator.[27] As before, the number of lags is determined examining the (partial) autocorrelation function. Only estimates of the relevant dummy variables are reported in the tables.

First, we focus on the impact of central bank independence. The constraint on PBC behavior in terms of high levels of CBI can be modeled as follows:

$$\begin{aligned} I_{it} &= \beta_{1i} + \beta_2 E_{it} + \beta_3 CBI_{it} + \beta_4 E_{it} CBI_{it} \\ &\quad + \sum_j \beta_{j+4} I_{i,t-j} + \epsilon_{it} \end{aligned} \tag{4}$$

The results are reported in Table 3.4. First, we only focus on the left column, that is the β_i's.

As in our previous regressions, the estimated coefficients remain insignificant. This confirms our findings of the country-specific model. As before, we cannot detect any pattern compatible with the PBC model. The result implies that elections do not influence the short-term interest rate, and as we do not find any evidence for an electoral pattern, the degree of central bank independence does not further influence our findings.

Second, we examine the impact of monetary policy autonomy. The loss of monetary policy autonomy of the existence of PBCs is modeled in the following way:

27 The LSDV (Least Squares Dummy Variables) estimator is obtained by applying the Within transformation to eliminate the individual effects and then performing OLS on the transformed model. Since in our sample the number of time periods is very large, the inconsistency of OLS estimates disappears, see Baltagi (1995), p. 125-126.

	National Constraint	(CBI)		International Constraint	(MPA)
	Coefficient	S.E.		Coefficient	S.E.
β_2	0.032	(0.045)	γ_2	0.069	(0.048)
β_3	-0.159	(0.129)	γ_3	0.031	(0.048)
β_4	-0.033	(0.073)	γ_4	-0.102	(0.071)

Table 3.4: The context-specific effects of elections on the short-term interest rate for all countries pooled

$$\begin{aligned} I_{it} &= \gamma_{1i} + \gamma_2 E_{it} + \gamma_3 NOMPA_{it} + \gamma_4 E_{it} NOMPA_{it} \\ &\quad + \sum_j \gamma_{j+4} I_{i,t-j} + \epsilon_{it} \end{aligned} \tag{5}$$

The results are reported in the right column of Table 3.4. Again, the estimated coefficients γ_i are not significant. Moreover, in contrast to our expectations, the coefficient for elections has a positive sign, which indicates that before elections monetary policy is comparatively restrictive.

The interaction of the dummy concerning monetary policy autonomy with the election dummy shows that if a country participates in a regime of flexible exchange rates, then the short-term interest rate is lower before elections. This is counterintuitive, as it would imply that if a country faces less restrictions, the possibility for PBCs increase.

Given these results, we have to reject the whole PBC theory as far as central banks are concerned. We do not find evidence that central banks actively engage in short-sighted behavior before elections. Indeed, we have to conclude that if cycles occur in monetary aggregates (as have been reported in previous studies), they are probably fiscally-induced, but central banks should not be held responsible for them, as we cannot find a regular pattern in the short-term interest rate.

As a last test for the PBC theory, we exclude countries which perform poorly from the pool. The main idea is that in order to find out whether we can detect*any* evidence of a political business cycle, we estimate the parameters for a smaller panel of countries which we believe have yielded 'good' estimates so far.[28]

28 This is certainly not the most 'sophisticated' estimation method, but can be justified as follows: if, after excluding countries with poor estimation results, still no evidence of a PBC is found, we can be quite confident that there isn't one.

Instead of pooling over all 16 countries, our sample now includes seven countries: Belgium, Denmark, Germany, Italy, Norway, United Kingdom and United States. The estimation results for this restricted sample are shown in Table 3.5. As before the results in the left column are for the model with the national constraint, while the right column reports the results for the international constraint.

	National Constraint	(CBI)		International Constraint	(MPA)
	Coefficient	S.E.		Coefficient	S.E.
β_2	-0.080	(0.074)	γ_2	-0.033	(0.079)
β_3	-0.205	(0.131)	γ_3	0.133	(0.071)
β_4	0.082	(0.106)	γ_4	-0.013	(0.107)

Table 3.5: The context-specific effects of elections on the short-term interest rate for a pooled regression containing seven countries

The coefficients reported in Table 3.5 have the expected signs but still lack in significance.[29]

The signs of the coefficients show that before elections, the short-term interest rate declines. An increase in central bank independence has similar effects, which can be explained by lower inflation expectations which (at a constant real interest rate) lowers nominal interest rates. Both coefficients are marginally insignificant. Furthermore, we find that independent central banks increase the interest rate before elections relative to central banks with low statutory independence. This last result is thus quite in line with the predictions from economic theory. However, we have to stress that these coefficients are not significant at conventional levels.

The part on the right of Table 9 shows the results for monetary policy autonomy. As before, in pre-election periods the short-term interest rate is lower. The absence of monetary policy autonomy (thus participation in a regime of fixed exchange rate) yields higher interest rates. Again, the coefficient is marginally insignificant. The combination of elections and no external constraint gives lower interest rates. However, this last result is highly insignificant.

To summarize, this last panel regression confirms our previous conclusions. Although the signs of the coefficients are quite in line with our prior expectations based on a combination of PBC models and internal and external constraints, the results are not sufficiently significant to conclude that constraints effectively reduce the scope for

29 The coefficients of main interest, i.e. for CBI, β_3 in the model for the national constraint and for $NOMPA$, γ_3 in the model for the international constraint, are significant at levels between 11% and 18%.

electoral manipulations. Indeed, we find little, if any sign of political business cycles in the short-term interest rate at all. Our estimation results suggest that central banks conduct monetary policy quite unimpressed from upcoming elections. Overall, we conclude that central banks do not engage in political business cycles at all.

4. Conclusions

A large body of literature examines the relationship between central bank independence and political business cycles. Similarly, the relationship between exchange rate regimes and PBCs has been investigated, but strangely enough, the combination of both has rarely been used. We have combined both approaches using a short-term interest rate as a proxy for the use of monetary instruments.

We derived two pieces of evidence. First, our results for the country-specific tests, based on the short-term interest rate for 16 OECD countries, are encouraging with respect to central banks. Overall, we find hardly any support for the PBC hypothesis. Two possible explanations arise. First, we could simply conclude that central banks do not manipulate interest rates before elections. This suggests that either governments do not have possibilities to force central banks to yield, or central banks have effectively resisted government's wishes. Our results do not suggest that the degree of statutory central bank independence matters in this respect. Second, our results could be due to the fact that the short-term interest rate is not as tightly controlled by the central banks as we have assumed. If financial markets have a strong impact on the short-term interest rate, under rational expectations manipulations are useless. This, however, would have the following implication. If (as the theory suggests) central banks use interest rate to manipulate monetary growth (and finally the inflation rate), and if their actions before elections have no effect on the short-term interest rate, then PBCs – if they exist in macroeconomic data, such as GNP growth or unemployment – cannot be due to central bank action, as these actions have no effect.

The second piece of evidence stems from our panel data regressions. We get more or less the same picture, that is no evidence for central banks actively creating political business cycles. However, one has to bear in mind that pooled samples are likely to be biased by some outliers. Indeed, some countries behave 'strangely', in that their estimation results differ greatly from the vast majority of countries. If we control for this and leave them out as we did in our last estimate, the results improve slightly and are more in line with the PBC literature, but the coefficients remain insignificant at conventional levels. We can therefore not confirm the PBC theory.

Overall, the implications are clear. If political business cycles in macroeconomic vari-

ables such as unemployment show up, then the central banks should not be blamed. Either their actions have no effect, or they simply do not engage in short-sighted behavior.

Further research has to be done why cyclical behavior can be found in monetary aggregates.[30] Still, if one believes that central banks have the power to control interest rates, then one has to reject the idea that central banks help governments to win elections. If electoral cycles in monetary aggregates exist, they could largely be demand-induced (perhaps due to fiscal behavior), but not due to central bank action.

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30 Berger and Woitek (1997b) provide the argument that uncertainty before upcoming elections causes cycles in monetary aggregates.

Appendix A:

Robustness Checks

We conducted a number of robustness checks to test our results. In the following subsections we will report some of these additional regressions.

A.1 Different Pre-election Periods

Economic theory can give no clear recommendation how long we should expect the pre-election period to be. Therefore, we have experimented with different lag lengths. In the literature, lags with the lengths of 12, 18 and 24 months are commonly used.

CBI	1 year		1.5 years		2 years	
	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
β_2	0.032	(0.045)	-0.041	(0.042)	0.007	(0.042)
β_3	-0.159	(0.129)	-0.196	(0.130)	-0.162	(0.132)
β_4	-0.033	(0.073)	0.077	(0.068)	-0.011	(0.068)
MPA						
γ_2	0.069	(0.048)	-0.006	(0.045)	-0.005	(0.045)
γ_3	0.031	(0.048)	0.007	(0.051)	-0.005	(0.057)
γ_4	-0.102	(0.071)	-0.012	(0.066)	0.012	(0.066)

Table 1.1: The context-specific effects of elections on the short-term interest rate for all sixteen countries pooled with different lag lengths

Additional regressions with lags of 18 and 24 months, reported in Table 1.1 for the model specification (4) reveal the following:[31]

1. The sign of the coefficients is dependent on the length of the election periods, but
2. none of the coefficients are significant. This result is independent of the chosen election lag length.

Thus, for an election period of 18 months the coefficients β_2 and γ_2 have the hypothesized sign, whereas for an election period of 1 year we obtain counterintuitive signs. For an election period of 2 years, the results are mixed. Bearing in mind, that none of the coefficients is significant, the change in sign is not surprising and does not change the overall implications.

31 Compare Table 1.1 with Table 3.4.

	1 year		1.5 years		2 years	
Country	Coefficient	S.E.	Coefficient	S.E.	Coefficient	S.E.
Austria	-0.165***	(0.058)	0.083	(0.055)	-0.144***	(0.053)
Japan	0.070	(0.061)	-0.016	(0.058)	-0.102*	(0.059)

Table 1.2: The effects of elections on the short-term interest rate for different election periods

Note, however, the two exceptions reported in Table 1.2 (in comparison to Table 3.1) for the model specification in equation (1). For Austria the coefficient is highly significant for election periods of 12 and 24 months, but not for 18 months. Also, the sign is reversed. The coefficient for Japan becomes slightly significant ($p = 0.08$) for an election period of 24 months, but not for 12 or 18 months.

To sum it up, changing the length of the pre-election period does not influence our overall conclusions as the election dummies in most cases remain insignificant.

A.2 Real Interest Rate

We also ran regression with the real short-term interest rate instead of the nominal short-term interest rate, which we proxied by subtracting the inflation rate from the nominal interest rate.

Compare Table 1.3 to the Tables 3.1 and 3.2 and Table 1.4 to Table 3.4.[32] The columns on the left give the estimation results if the dependent variable is the nominal interest rate, the columns on the right give the estimation results if the dependent variable is the real interest rate. We do not only see that the significance of the results is not affected by the use of the real short-term interest rate instead of the nominal short-term interest rate, but also that for most cases the estimated coefficients are surprisingly similar.

A.3 Additional Explanatory Variables

Finally, we included the GNP growth rate and inflation as additional explanatory variables. Both are detrended if necessary.[33]

Again, compare the Table 1.5 to the Tables 3.1 and 3.2 and Table 1.5 to Table 3.4 in the paper. The columns on the right give the estimation results if the GDP growth rate

32 Results for Australia and New Zealand are not available.

33 Results for Australia and New Zealand are not available.

	nominal rate		real rate	
Model (1)	Coefficient	S.E.	Coefficient	S.E.
Canada	0.107	(0.158)	0.108	(0.158)
US	0.018	(0.095)	0.034	(0.098)
Austria	-0.165***	(0.058)	-0.164***	(0.058)
Denmark	0.058	(0.135)	0.057	(0.135)
Germany	-0.032	(0.065)	-0.007	(0.066)
Japan	0.070	(0.061)	0.071	(0.063)
Model (2)				
$\beta_3 : E * NOMPA$				
Belgium	0.184	(0.191)	0.208	(0.205)
Finland	-0.023	(0.296)	-0.025	(0.296)
France	0.057	(0.167)	0.058	(0.167)
Italy	-0.156	(0.170)	-0.158	(0.170)
Norway	-0.768	(0.768)	-0.771	(0.768)
Spain	0.039	(0.866)	-0.164	(0.713)
Sweden	-0.173	(0.267)	-0.173	(0.267)

Table 1.3: The effects of elections on the real short-term interest rate

and the inflation rate are included as regressors in the model equation, the columns on the left give the estimation results excluding these variables.

On the whole we see that the results are very robust.[34] This means that the additional explanatory variables do not change the overall conclusion of the paper.

34 In Table 1.5 the robustness of the results for Norway and Spain is debatable.

	nominal rate		real rate	
	Coefficient	S.E.	Coefficient	S.E.
Context dependent				
β_2	-0.055	(0.132)	-0.055	(0.133)
β_3	-0.109	(0.123)	-0.102	(0.132)
β_4	0.014	(0.236)	0.009	(0.241)

Table 1.4: The effects of elections on the real short-term interest rate for the panel model

	without GDP/inflation		with GDP/inflation	
Model (1)	Coefficient	S.E.	Coefficient	S.E.
Canada	0.107	(0.158)	0.157	(0.161)
US	0.018	(0.095)	-0.019	(0.093)
Austria	-0.165***	(0.058)	-0.160***	(0.059)
Denmark	0.058	(0.135)	-0.014	(0.144)
Germany	-0.032	(0.065)	-0.011	(0.068)
Japan	0.070	(0.061)	0.047	(0.062)
Model (2) $\beta_3 : E * NOMPA$				
Belgium	0.184	(0.191)	0.238	(0.205)
Finland	-0.023	(0.296)	0.120	(0.298)
France	0.057	(0.167)	0.048	(0.171)
Italy	-0.156	(0.170)	-0.321	(0.237)
Norway	-0.768	(0.768)	-1.878*	(1.123)
Spain	0.039	(0.866)	-0.393	(0.596)
Sweden	-0.173	(0.267)	-0.223	(0.267)

Table 1.5: The effects of elections on the short-term interest rate with additional explanatory variables included

Appendix B:

Data Sources

We mostly use monthly data from IFS statistics on industrial production, inflation and the short-term interest rate (line 60B). Additionally data have been provided directly by the following central banks: Denmark, Sweden, UK and New Zealand. Data for Germany have also been used from the CD-ROM "Deutsche Bundesbank: 50 Jahre Deutsche Mark". Data for the United States have been obtained from FRED

	without GDP/inflation		with GDP/inflation	
	Coefficient	S.E.	Coefficient	S.E.
Context dependent				
β_2	-0.055	(0.132)	-0.039	(0.134)
β_3	-0.109	(0.123)	-0.067	(0.139)
β_4	0.014	(0.236)	-0.001	(0.239)

Table 1.6: The effects of elections on the short-term interest rate with additional explanatory variables included

(http://www.stls.frb.org/fred/).

Growth rates are computed as the change in the log of the raw series and have been detrended if necessary. All computed series were stationary. The election dummy is +1 eleven months before the election and during the election month, and 0 otherwise. The dummy for central bank independence is +1 if the level of central bank independence is above-median, and 0 otherwise. The dummy for monetary policy autonomy is +1 if monetary policy autonomy is absent, and 0 otherwise.

The sample period differs for each country due to data availability. For the short-term interest rate, the following data were available: Austria 1967:1-1997:12; Australia 1969:7-1996:06; Belgium 1960:1-1997:12; Canada 1975:1-1997:12; Denmark 1972:1-1997:12; France 1964:1-1997:12; Finland 1972:10-1997:12; Germany 1960:1-1997:12; Italy 1971:1-1997:12; Japan 1960:1-1997:12; Norway 1971:8-1997:12; Spain 1974:1-1997:12; Sweden 1965:12-1997:12; UK 1960:1-1997:12; US 1960:1-1997:12; New Zealand 1973:1-1997:12.

Due to lack of election data, the sample period for Canada reduces to 1975:1-1996:07. Due to lack of democratic elections, the sample period for Spain reduces to 1977:1-1997:12.

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