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ELECTIONS AND MONETARY POLICY: IS THERE A POLITICAL MONETARY CYCLE FOR SWITZERLAND?

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1. Introduction

Indirect political influence on monetary policy is investigated by testing for effects of fiscal policy on monetary policy. Direct political influence is analyzed in the framework of elections, parties and administrations. This paper addresses the question whether elections have any effect on Swiss monetary policy. While this question has been analyzed for most major central banks, an explicit and systematic test for the Swiss National Bank is still missing.[1] This study intends to fill that gap.
Evidence for the existence of a political business cycle for Switzerland is reported by Soh (1986) for the period from 1960 to 1980. He does not present any significance tests, however. Here, systematic tests for a political monetary business cycle are carried out for the period of flexible exchange rates (from 1973.2 to 1995.2). These tests do not confirm the existence of a political monetary cycle for Switzerland. This is consistent with the hypothesis of political independence of the Swiss central bank.
The paper is organized as follows. Section 2 presents an overview of models of politico-economic cycles following the work of Alesina and his coauthors. Section 3 addresses the question whether the existence of a political monetary cycle for Switzerland can be explained on theoretical grounds. Section 4 critically reviews Soh's findings of a political business cycle for Switzerland. Section 5 presents various systematic tests of political monetary cycles. Section 6 offers a brief conclusion.

2. Models of Politico-Economic Cycles: An overview

Do politicians manipulate economic policy in order to win elections? And more specifically: Do elections matter for monetary policy? There are basically two arguments proposed in the

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[1] Electoral cycles for monetary policy have been investigated for the Federal Reserve and most other central banks. Applications to the Federal Reserve include Alesina 1988, Alesina/Sachs 1988, Allen 1986, Beck 1982, 1984 and 1987, Grier 1987 and 1989, Haynes/Stone 1989, Havrilesky 1987, Laney/Willet 1983. For a more recent application to the German Bundesbank see Lang/Welzel 1992. Other applications to the Bundesbank are cited in Vaubel 1993 49. Multi-country studies are Alesina/Cohen/Roubini 1992 and 1993, Alesina/Roubini 1992. Switzerland is also included in some of these time series cross section analyses. Country by country results are also reported for Switzerland for the period 1958-1987. (See Alesina/Cohen/Roubini 1992 16, table 8) They show no signs of political manipulation of monetary policy.

literature, the opportunistic and the partisan argument. Table 1 summarizes the respective models, following the discussion in Alesina/Roubini 1992. The models are classified along the two most important dimensions, the assumption about policymakers' motivations and the assumption about the rationality of voters and economic agents. (Alesina 1988 16)

Table 1: Politico-Economic Models of Business Cycles

	opportunistic models	**partisan models**
first phase: **'pre-rational expectations' models**	PBC = political business cycle models *Nordhaus 1975* *Lindbeck 1976*	PT = partisan theory *Hibbs 1977, 1987*
second phase: **rational expectations models**	RPBC = rational political business cycle models *Cukierman/Meltzer 1986* *Rogoff/Sibert 1988* *Rogoff 1990* *Persson/Tabellini 1990*	RPT = rational partisan theory *Alesina 1987* *Alesina/Sachs 1988*

Source: Alesina 1988 16 table 1 (modified).

It is assumed that the reader is sufficiently familiar with the theory of political business cycles. Therefore, only the basic arguments and the testable predictions derived from the different models are presented here.[2]

According to Nordhaus (1975) political business cycles occur because politicians stimulate aggregate demand before elections in order to create fast growth and reduce unemployment. The inflationary consequences of this policy are eliminated by a post-electoral contraction. Voters are assumed to be retrospective and myopic so that they can be fooled. The policymakers' only incentive to manipulate the economy is to enhance their chances of reelection. It doesn't matter whether a right-wing or a left-wing party is in power. The Nordhaus model predicts that there will be a business cycle which peaks before the elections. But it remains unclear how long before the elections the stimulus has to occur.

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[2] For a more detailed review of the theory of political business cycles see Alesina/Roubini 1992 section 2. See also Berthold/Fehn 1994 and Belke 1993. For a textbook exposition see Mueller 1989 ch. 15.

Empirical results for the Nordhaus model were mixed. Moreover, the rational expectations' critique damaged the theoretical argument.[3] In the late eighties a new generation of 'rational political business cycles models' emerged. Rogoff (1988 56) calls them political budget cycle models. Since these models assume rational expectations for voters and economic agents, their empirical implications differ from those of the Nordhaus model. Elections still lead to business cycles. But these cycles are much shorter, less pronounced, less regular, and not easy to predict. They can be observed on movements of fiscal and monetary policy instruments (such as taxes, transfers, government spending, and money growth). They are less likely to be observed on policy outcomes (such as output growth, inflation or even unemployment). (See also Berthold/Fehn 1994 171)

Politicians may not only behave in an opportunistic manner and maximize their popularity or their probability of reelection. They may be partisan and have ideological objectives. The partisan models of political cycles assume that different parties maximize different objectives, because they represent the interests of different constituencies. When in office, they pursue policies which are favourable to these constituencies. Generally, left-wing parties are assumed to be more concerned with the problem of unemployment. Right-wing parties are relatively more willing to reduce inflation and to bear the costs of unemployment. Hence, partisan models of the 'pre-rational' (Hibbs 1977 and 1987) and the rational type (Alesina 1987, Alesina/Sachs 1988) predict systematic differences in macroeconomic policymaking between the 'unemployment averse' left and the 'inflation averse' right parties. These parties choose different points on the Philipps curve. Hence, cycles differ for the parties in power. 'Pre-rational' partisan models hypothesize that with left-wing governments in power output growth and inflation should be permanently higher and unemployment permanently lower than with right-wing governments. (Alesina/Roubini 1992 666) In rational partisan models "permanently different inflation rates across parties may result only in temporary, post-election differences in growth and unemployment." (Alesina/Roubini 1992 664)

Opportunistic and partisan models can coexist. "First, as suggested by the 'political business cycle' models, politicians prefer being in office rather than out, so they have an incentive to manipulate the economy in order to be reelected. In addition, as suggested by the 'partisan theory', they may also have ideological objectives. However, 'partisan' goals can be implemented only if elections are

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[3] See Grier 1989 387 on early attempts to reconcile the political business cycle with rational expectations.

won. Thus, even partisan politicians, regardless of their ideology, may engage in opportunistic behavior if, by doing so, they can increase their chances of reelection." (Alesina/Cohen/Roubini 1993 20; see also Alesina/Roubini 1992 683.)
As a further possibility, pre-electoral opportunistic behavior may be different for left- and right-wing governments.[4]

3. Application to Switzerland: Why Should There Exist a Political Monetary Cycle?

Although the existence of a political business cycle ultimately is an empirical question that cannot be settled by a priori argument, the theoretical question remains: How can the existence of a political business cycle be *explained* for Switzerland? Asked more specifically: Why should the timing of elections exert a significant influence on money growth in Switzerland?
It turns out that the existence of a political business cycle for Switzerland is not easy to rationalize on the basis of the political system and the constellation of parties in power. Two possible arguments can be put forward:
A first explanation is that the right-wing dominated government tries to boost the economy in the election year in order to maximize political support for the election. But the right-wing coalition has a comfortable majority, so that an electoral manipulation of monetary policy may not be needed.
A second explanation is that this is not a strategy of incumbent *parties*, but a strategy of incumbent *politicians* in general to stay in power aimed versus those running for election for the first time. This is a purely opportunistic argument - neglecting any partisan aspects of the business cycle approach. The critical point is that this would require a big alliance among all (or at least most) politicians in office.
Both arguments are not really convincing, so that the theoretical case for the existence of a political business cycle for Switzerland is questionable.
The application to monetary policy meets an additional difficulty that weakens the theoretical argument. Theories of political business cycles typically do not distinguish between government and central bank. It is assumed that the government determines the money supply. This assumption appears inappropriate for countries with formally independent central banks. It is argued, however, that even formally independent central banks will not be able to pursue a monetary policy that conflicts with the interests of the

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[4] See Alesina/Cohen/Roubini 1992 15. They account for this possibility by investigating a 'partisan/opportunistic' interaction term.

government in the long run. (Berthold/Fehn 1994 166; see also Frey/Schneider 1981 294 on this.) Empirical results for the German Bundesbank, formally one of the most independent central banks, seem to confirm this position. Several studies report some form of political manipulation of its monetary policy. (See e. g. Alesina/Cohen/Roubini 1992 15, Frey/Schneider 1981, Lang/Welzel 1992, Schneider 1979.) This might suggest that the theoretical argument for the existence of a political monetary cycle has to build on the characteristics of the political market rather than the institutional arrangements that constitute formal independence.

As stated before, characteristics of the Swiss political market make an electoral manipulation of monetary policy rather unlikely. But since the existence of a political business cycle is an empirical question - and since some evidence for its existence has been reported by Soh (1986) - this result should also be established by having a closer look at the data (and the econometric evidence). In addition, tests for political monetary cycles will also yield further evidence on the political (in)dependence of the Swiss National Bank.

Two different approaches are pursued here. First, Soh's results are reproduced and the corresponding calculations for the period of flexible exchange rates are added. Because of the weaknesses of this approach, more rigorous tests of the political monetary cycle follow.

Empirical tests of partisan models require changes between left- and right-wing governments. Since Switzerland had no political change in government during the period under investigation (even since 1959) tests for partisan models are not viable. But the predictions of the opportunistic models of the 'pre-rational' and rational type can be tested.

Tests of political business cycles can be carried out on policy *outcomes* (e. g. output growth, unemployment, inflation), and on policy *instruments* (such as money growth, taxes, transfers, and government spending). (Alesina/Cohen/Roubini 1992 5) Here, tests will focus on potential effects of elections on money growth. Signs for the existence of a political monetary cycle would suggest evidence for political dependence of the Swiss National Bank.

Does the variable representing the political business cycle (the electoral variable) measure executive or legislative influence? This question is not of interest for parliamentary democracies where the executive cannot exist without a majority in parliament. But a separation between executive and legislative influence is of interest in the case of the U.S. - where the Presidency does not depend on a majority in Congress - or Switzerland - where the executive's policy at times diverges from the majority in parliament. While in applications to the U.S. the electoral variable

is usually supposed to represent executive political influence, the case is less clear for Switzerland. Since the Swiss executive is nominated immediately after the election of the legislature significance of an electoral variable cannot unambiguously be ascribed to the executive or the legislature. The electoral variable can measure the political influence of both, the executive and the legislature.

4. Comparing Economic Conditions for Election and Nonelection Years

Political business cycle models of the opportunistic, 'pre-rational' expectations type predict that in election years we should observe faster economic growth, lower inflation rates, and less unemployment. Following Soh (1986) the means of these three economic indicators are calculated for election years, nonelection years, and all years for the sample period from 1973 to 1995. Then the means for election and nonelection years are compared. The ratio of election year mean to nonelection year mean can be used as preliminary evidence of political business cycles. An opportunistic government will try to please voters by increasing economic growth in election years. Hence, for economic growth this ratio should be greater than one. Inflation should be lower in election years than in nonelection years. A ratio of the average rate of inflation in election years to that in nonelection years less than one would indicate preliminary evidence for the existence of political business cycles. For unemployment, this ratio should also be less than one.

Table 2 reproduces Soh's results for Switzerland (for the sample period 1961-1980) and adds the same indicators calculated for the period of flexible exchange rates (from 1973 to 1995).

While Soh finds preliminary evidence of political business cycles with the unemployment rate, the indicators for the sample period 1973-1995 do not confirm his findings. Only the ratio for the inflation rate is consistent with the predictions of the opportunistic political business cycle theory. But it is very close to one (0.98).

Soh's findings for the unemployment rate should not be overstated given the small sample (from 1975 to 1980) consisting of just one election and four nonelection years! Moreover, the unemployment rate is probably not a very useful indicator in this particular case, because it was very low during the whole sample period.

Table 2: Election Year vs. Nonelection Year Economic Conditions

	Ratio[a]	Election year mean	Nonelection year mean	All year mean	All year stand. dev.
Growth rate of disposable real income (%)					
1961-1980	0.45	1.61	3.60	3.10	3.00
1973-1995[b]	-0.08	-0.13	1.72	1.24	2.32
Rate of inflation (%)					
1961-1980	1.28	5.08	3.96	4.24	2.40
1973-1995	0.98	3.72	3.79	3.77	2.51
Rate of unemployment (%)					
1975-1980	0.90*	0.30	0.42	0.38	0.17
1973-1995	1.15	1.27	1.10	1.14	1.41

[a] The ratio of election year mean to nonelection year mean; [b] growth rate of real GDP (%); * indicates preliminary evidence of political business cycles.
Source: Soh 1986 33 table 1 (modified).

Average ratios can be heavily biased by extreme values. (A good example is the growth rate of -7% in the election year of 1975.) As an alternative Soh proposes the following procedure. First, the number of election years in which economic growth accelerated, inflation slowed down, or unemployment reduced, are counted and the percentage of these years to total election years is calculated. Second, the same percentage is calculated for nonelection years with acceleration of economic growth, deceleration of inflation, or reduction of unemployment. Third, for each indicator the percentages for election and nonelection years are compared. The existence of a political business cycle is indicated if the percentages of election years are at least 50 percent, and if (at the same time) they are greater than the comparable percentage of nonelection years by at least 10 percentage points. If the high incidence of election year acceleration or deceleration of an indicator coincides with the hypothesized ratio of the average of election year compared to nonelection year (table 2), strong evidence of political business cycles is assumed. Soh finds this hypothesized pattern for Switzerland with the unemployment variable.

Again, Soh's findings are displayed in table 3 along with the corresponding values calculated for the sample period 1973-1995. Soh's result for the unemployment rate suffers from the weaknesses stated above. And the results for the period of flexible exchange rates do not support the predictions of the political business cycle theory.

Table 3: Improvement of Economic Conditions During Election Years vs. Nonelection Years

	During election years	During nonelection years	Total number of occurence	Proportion among election years	Proportion among nonelection years
Acceleration of income growth					
1961-1980	3	6	9	60*	43
1973-1995[a]	3	8	11	50	47
Deceleration of inflation					
1961-1980	3	7	10	60*	50
1973-1995	2	8	10	33	47
Reduction of unemployment					
1975-1980	1	2	3	100**	40
1973-1995	1	8	9	17	47

The 1961-1980 period has 5 election and 14 nonelection years. The 1973-1995 period has 6 election and 17 nonelection years. [a] growth rate of real GDP (%); * indicates a proportion among election years which is greater than or equal to 50% and is greater than the proportion among nonelection years by at least 10 percentage points; ** according to Soh 'strong evidence' or 'real indication of political business cycle'.
Source: Soh 1986 35-36 tables 2 and 3 (modified).

For a small open economy realized economic conditions such as rates of economic growth, inflation and unemployment depend heavily on international factors. Domestic political authorities may have very limited influence. Therefore, it might be more appropriate to turn to economic policy instruments. In addition to realized economic conditions (rates of economic growth, inflation and unemployment) Soh also analyses the two most important measures of economic policy, the rate of change in government expenditures and money supply. Opportunistic political business cycle theory predicts that both will increase before elections.

Their growth rates in election years are compared with those in nonelection years. To account for time lags from policy implementation to the realization of its effects the rates of one year before an election are compared with rates in other years including election years, too.
Table 4 lists Soh's results along with corresponding values calculated for the sample period 1973-1995. Soh finds evidence of political business cycles in the growth rates of government expenditures (one year before election), and in the growth rates of money supply (one year before election and also during the election year). The data for the period of flexible exchange rates do not confirm the finding for the government expenditures. (The one year before election ratio only marginally exceeds one.) However, results for the growth rate of the saisonally adjusted monetary base are consistent with the predictions of the opportunistic business cycle theory. Mean growth rates are much larger for election years and one year before the elections than in other years.

Table 4: Growth Rates of Government Expenditures and Money Supply

	Growth rates of government expenditures		Growth rates of money supply	
	1961-1980	1973-1995	1961-1980	1973-1995[a]
Election year ratio[b]	0.57	0.75	1.25*	7.53*
Election year mean (%)	6.50	5.16	8.64	4.12
Nonelection year mean (%)	11.33	6.86	6.93	0.55
1 year before election ratio[c]	1.27*	1.02	1.10*	7.00*
1 year before election mean (%)	12.01	6.51	7.88	4.03
Other year mean (%)	9.49	6.38	7.19	0.58
All year mean (%)	10.12	6.42	7.36	1.48
All year stand. dev.	7.83	4.75	6.28	5.22

[a] growth rate of the saisonally adjusted monetary base; [b] ratio of election year mean to nonelection year mean; [c] ratio of mean in one year before election to the mean of other years; * indicates evidence of political business cycles.
Source: Soh 1986 38 and 40 tables 4 and 5 (modified).

Although these results for government expenditures and especially for the money supply and the monetary base are interesting, the whole approach of comparing economic conditions for election and nonelection years must be criticized on at least two grounds. First, there is no control for other factors that might have caused these effects. Second, this approach does not present any significance tests. Two more criticisms must be added to Soh's results. His finding for the unemployment variable is very questionable for the reasons explained above. And his sample extends over the period of fixed exchange rates only where monetary growth could not really be manipulated by domestic policymakers.
The following section pursues the issue with the money supply further by presenting rigorous tests for the existence of a political monetary cycle.

5. Testing for Political Monetary Cycles

All types of political business cycles require some electoral manipulation of either, or both, of the macroeconomic policy instruments, monetary and fiscal policy. The goal of this section is to test for the existence of opportunistic political business cycles on Swiss monetary policy.[5]
Different approaches can be used to empirically investigate the relationship between monetary policy and elections. Figure 1 presents an overview and indicates some tests that are performed in this paper.
Most authors work with 'fixed-effect models', i.e. they assume constant slopes. (See Alesina/Roubini 1992 669) One might argue that the monetary cycle takes a specific form for each election. This is in fact somewhat the prediction of rational political business cycle theory, since cycles are not only hypothesized to be shorter, but also to be less regular. (See Belke 1993 920) In this case it is not correct to assume fixed effects for election years. To model the uniqueness of each election, separate dummies are constructed for every election and entered, either one at a time, or all together, in the regression equation. (See Beck 1984 for an example)

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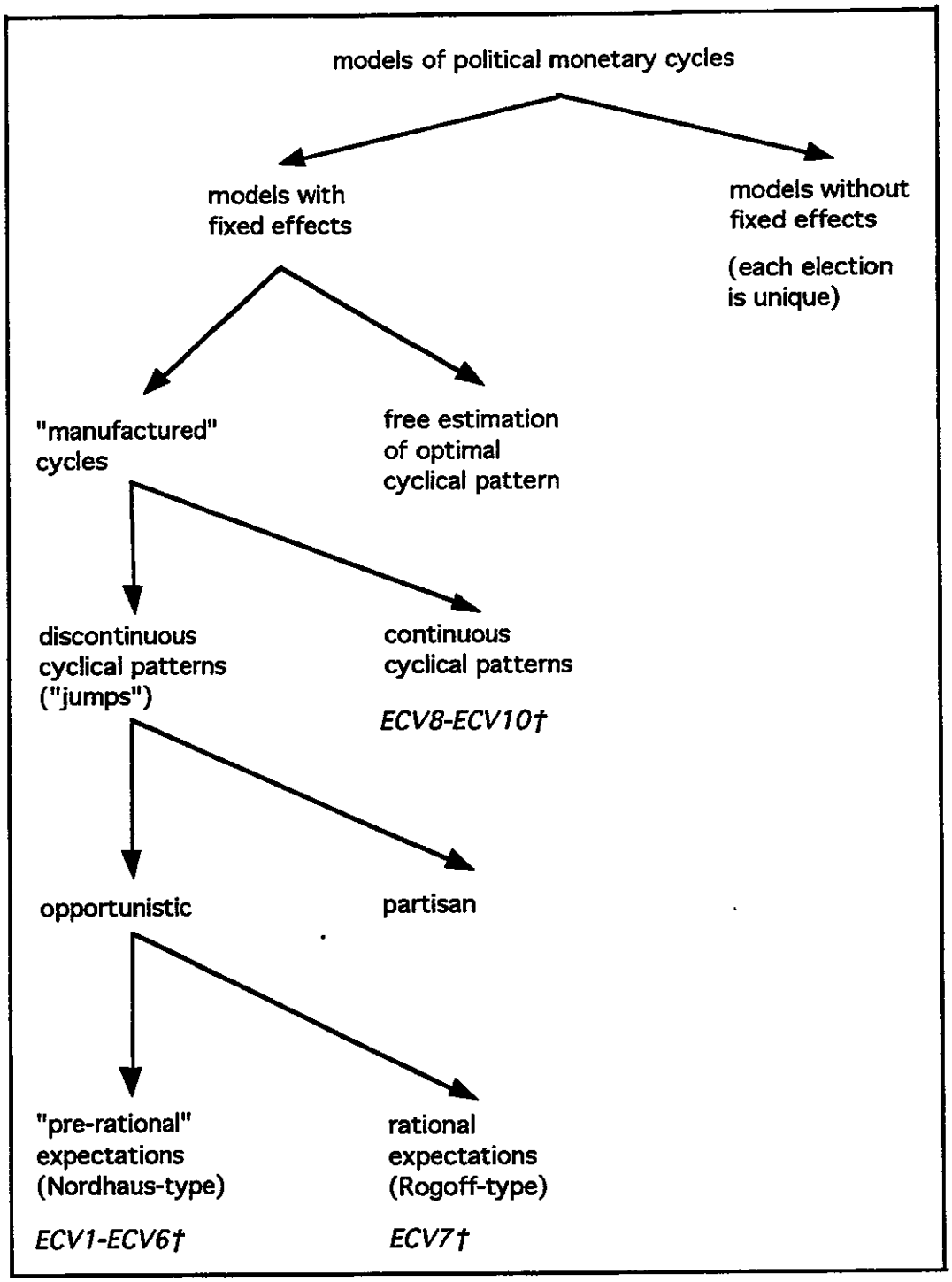
[5] As noted above, tests for the existence of political business cycles can be carried out for policy outcomes and policy instruments. Pre-electoral fiscal and monetary 'favours' to key constituencies are not only electorally very useful. They are also easy to implement, relative to an attempt to increase the rate of growth of GNP, for instance. For a test using the inflation rate (a policy outcome) as dependent variable see e. g. Alesina/Roubini 1992.

Figure 1: Testing for the Existence of Political Monetary Cycles



† variables tested in this section.

Within fixed-effect models there are two ways to look for cycles in monetary policy. One approach is to 'manufacture' dummy variables that are supposed to capture the cycle. Another approach is the free estimation of the optimal cyclical pattern using the Almon polynomial technique. Manufactured dummy variables

"impose different prior restrictions on the pattern of the election cycle, such as piece-wise linearity, precise turning points, and a duration of 16 quarters. By using a dummy variable/polynomial distributed lag (PDL) technique this type of prior restriction can be avoided and the data can 'speak for itself' about the existence, shape, and periodicity of the electoral cycle." (Grier 1987 478) In the estimation with the Almon lag model the election variable takes the shape that best fits the data.
'Manufactured' dummy variables can model 'jumps' in monetary policy or other, rather continuous cyclical patterns. 'Jumps' in monetary policy may have their causes in opportunistic or in partisan behavior of policymakers. And in both cases cycles may describe the 'pre-rational expectations' or the rational expectations hypotheses.
The electoral variable can have many different shapes. The definitions of 'manufactured' electoral dummy variables used in this section are summarized in table 5.

Table 5: 'Manufactured' Electoral Cycle Variables

	Quarters of each electoral period															
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
	Year one				Year two				Year three				Year four			
Variable	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
ECV1	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1
ECV2	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1
ECV3	0	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1
ECV4	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
ECV5	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	0
ECV6	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	0
ECV7	-1	-1	0	0	0	0	0	0	0	0	0	0	0	0	1	1
ECV8	7	6	5	4	3	2	1	0	1	2	3	4	5	6	7	8
ECV9	9	6	3	0	1	2	3	4	5	6	7	8	9	10	11	12
ECV10	8	6	4	2	0	0	0	0	0	2	4	6	8	8	8	8

The different specifications describe possible shapes of the electoral cycle and are supposed to capture the implications of different business cycle theories.

ECV1 to ECV6 represent the Nordhaus cycle. Nordhaus predicts a monetary stimulus before elections. The exact timing of monetary ease depends on several factors. First, it depends on how myopic voters are assumed to behave. Second, it takes some time for monetary changes to show up in the real economy. (Beck 1984 788) Because of anticipated lags the stimulus might even be hypothesized in the year before the election, with no effort in the election year itself. (Laney/Willett 1983 59) Third, elections occur in four year intervals. Therefore, a specification of the pre-electoral period longer than eight quarters seems unreasonable. (Alesina/Roubini 1992 676-677)

Here, the general definition of the first three electoral variables representing the Nordhaus cycle is as follows: ECVN is equal to 1 in the (N-1) quarters preceding an election and in the election quarter; it is equal to 0 otherwise. The choices for N are 4 (ECV1), 6 (ECV2) and 8 (ECV3). According to ECV1 the effects of elections can be felt only in the years in which they occur. In ECV3 the electoral dummy assumes the value of 1 in the second half of each administration and zero otherwise. It hypothesizes two years of restraint to combat inflation and two following years of stimulus as the election approaches.[6]

ECV4 to ECV6 are slightly different specifications of the Nordhaus-type business cycle. In all three cases, money growth increases just prior to an election, excluding the election quarter.[7] ECV4 is the electoral dummy variable originally employed by MacCallum (1978), ECV5 is adopted from Allen (1986), and ECV6 is a specification used by Beck (1984).

ECV7 represents the Rogoff cycle. (See Alesina 1988 37 for an example.) Because of the assumption of rational expectations, money growth must increase immediately before elections, and it must be reduced immediately after elections. Over the rest of the cycle money growth is not (electorally) manipulated, since that would be counterproductive to the reelection goals of politicians. In this model there is no need for monetary policy to show effects on the real economy (i. e. on growth and employment), because voters will anticipate these effects as soon as they learn about the money surprise (for instance in the form of interest rate

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[6] According to Laney/Willett (1983 59) this last scenario may correspond most closely to the Nordhaus cycle for the U.S., since Nordhaus divides his electoral periods generally in half in this fashion.

[7] Beck (1987 203) argues that voters are unconcerned with (and not even knowledgeable about) money growth. They care about its consequences, such as unemployment and inflation. Because of the monetary policy lag money growth during the electoral quarter will not show up in the variables that have an electoral impact until after the election. Therefore, it is unreasonable to assume that money will grow most rapidly on election day.

reductions).[8] Therefore, the monetary expansion can take place much shorter before the election.
A comparison of ECV1 to ECV6 with ECV7 should allow for some discrimination between the Nordhaus-type and the Rogoff-type cycle.
The electoral variables ECV1 to ECV7 are specified to capture any 'jumps' in the monetary growth rate around (i. e. before and after) election dates. ECV8 to ECV10 represent other possible shapes of the electoral monetary cycle that are employed by Grier (1987). ECV8 is a symmetric V-shaped cycle with 8 quarters of monetary deceleration followed by 8 quarters of acceleration. (A very similar variable is already employed by MacCallum (1978) and Allen (1986)). ECV9 depicts a short and intensive period of monetary deceleration after the election followed by 12 quarters of cyclical growth. It is maximal at election quarter and minimal a year later. ECV10 "is designed to capture deceleration after an election and acceleration before, with a 5 quarter trough in the middle." (Grier 1987 477).
Obviously there could be many other cycle patterns constructed. The present choice of patterns inevitably involves some degree of arbitrariness. But these ten cycles should capture the most basic forms, and they should help discriminate between two things: first between the Nordhaus-type cycle and the Rogoff-type cycle, and, second, between simple 'jumps' around the elections and other shapes that imply a 16 quarter cycle.
These ten separate specifications of an electoral cycle are then tested, one at a time, first by adding to a reaction function, second by adding to an autoregressive model for money growth. A positive and significant coefficient on the electoral cycle variables is consistent with the modeled electoral cycle.
For small open economies like Switzerland the exchange rate regime decisively influences the possibility of manipulating monetary policy. (see Alesina/Roubini 1992 667 FN 7) The inclusion of exchange rate dummies may not be sufficient to model these effects. For this reason the analysis is restricted to the period of flexible exchange rates, where this policy instrument could be manipulated in order to enhance chances of reelection.
The sample period from 1973.2 to 1995.2 includes five elections. The timing of the elections is exogenous. Elections take place every four years at the beginning of the fourth quarter.[9] This yields

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[8] These cycles "may imply very little or nothing at all for a four-year cycle on employment; thus, they are consistent with the lack of empirical evidence for the Nordhaus' 'political business cycle'." Alesina 1988 36.

[9] Especially for rational political business cycle models it remains unclear whether this quarter should be considered pre- or post-electoral. See also Alesina 1988 37 for the U.S.

the following election dates: 1975:4, 1979:4, 1983:4, 1987:4, 1991:4. Parliament and executive are always dominated by a right-wing majority. Since there is no change in government (from right to left and vice versa), the partisan models cannot be tested.
Quarterly data are used because the precise timing of cyclical fluctuations in relation to elections is crucial for the theories. (Alesina/Roubini 1992 668)[10]
In a first approach the electoral variables are tested in the context of reaction functions. In a second approach, these variables enter autoregressive model specifications.

a) Evidence from Reaction Functions

In addition to the electoral variable the central bank may systematically respond to other variables, such as inflation rate, exchange rates, growth rate of GDP, and interest rates. To control for these other factors the following reaction function is specified:

$$MB_t = \beta_0 + \beta_1 MB_{t-1} + \beta_2 CPI_{t-1} + \beta_3 DMN_{t-1} + \beta_4 GDPSR_{t-1} + \beta_5 \Delta DR_{t-1} + \beta_6 ECV + \varepsilon_t$$

$$(M1_t)$$

The growth rate of the monetary base (the money supply M1) is regressed on a lagged dependent variable, the lagged change in the consumer price index CPI, the lagged change in the nominal Swiss franc/Deutschmark exchange rate index DMN, the lagged growth rate of real and saisonally adjusted gross domestic product GDP, the lagged change in the three-month deposit rate DR, and an electoral cycle variable. (See table 6 for variable definitions and data sources.) Models with both quarterly and yearly rates of change are estimated. Except for the deposit rate these growth rates are calculated as first and fourth differences of natural logarithms. The deposit rate is measured in first and fourth differences. Since most series are not saisonally adjusted regressions with quarterly rates include three saisonal dummies.[11] In the annual models saisonality is removed by the definition of the yearly rates of change. (For a similar method of saisonally

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10 Of course, quarterly data are preferred to annual data for other reasons, too. Quarterly data yield more observations and, hence, more robust statistical tests.

11 The question whether saisonally unadjusted or adjusted data are used may be important. "Haynes and Stone (1987) argue that one reason they found a political business cycle when others did not is that they used unadjusted data. Since the political monetary cycle peaks in the fourth quarter of the election year, it is possible that seasonal adjustment also removes the political cycle." (Beck 1987 213)

adjusting the data see Alesina/Cohen/Roubini 1992 14 and Alesina/Cohen/Roubini 1993 12.)

Table 6: Variable Definitions and Data Sources

Variable	Definition	Source
	dependent variables	
MB	unadjusted monetary base (first and fourth differences of natural logarithms)	SNB[1]
M1	money supply M1, including Liechtenstein (first and fourth differences of natural logarithms)	KOF[2]
	control variables used in reaction functions	
CPI	consumer price index, 1977=100 (first and fourth differences of natural logarithms)	BFS[3]
DMN	Swiss franc/Deutschmark exchange rate index, nominal, November 1977=100 (first and fourth differences of natural logarithms)	SNB
DR	deposit rate: rate of interest on three-month deposits with large banks (first and fourth differences)	SNB
GDPSR	gross domestic product, seasonally adjusted, real (first and fourth differences of natural logarithms)	BFK[4]

1 Swiss National Bank, Monthly Bulletin
2 Konjunkturforschungsstelle Eidgenössische Technische Hochschule Zürich
3 Bundesamt für Statistik
4 Bundesamt für Konjunkturfragen

All reaction functions are first estimated excluding the electoral variables.[12] Tests for structural stability indicate a 'regime' shift for 1980.[13] Hence, all regressions incorporate a structural break at the beginning of 1980, i. e. all coefficients are allowed to be different before and after 1980. These models are then tested for

12 For a detailed outlining of the estimation procedure see Jeitziner 1995 38-40.

13 Alesina/Cohen/Roubini (1992 15) find that their model for the US performs differently before and after the 80s. "One explanation may be that policy manipulation was ineffectual, and thus not utilized after 1980 due to the well documented instability of the money demand equation in the U.S." And in FN 14 thy refer to Friedman/Kuttner (1989) for an in depth discussion of the instability of the money demand equation in the 1980s. The difference between pre- and post-1980 results of the political monetary cycle for the U.S. is also noted by Grier (1989).
For Switzerland this instability might well have an international dimension, since the 1980 break comes soon after the founding of the European Monetary System (whose Exchange Rate Mechanism began in March 1979) and a generalized shift to disinflationary polices by most Western economies after the second oil shock. I am grateful to R. C. K. Burdekin for suggesting this point. See Burdekin 1994 for more on this subject.

autocorrelation and heteroskedasticity. This residual analysis (Q tests, Lagrange multiplier tests, Durbin-Watson tests) shows no signs of autocorrelation and heteroskedasticity for the quarterly model with the money supply M1 as dependent variable. But it indicates heteroskedasticity in the quarterly and yearly monetary base and in the yearly money supply growth models. In order to correct for the inefficiency of the OLS estimates in the presence of heteroskedasticity these models are estimated using weighted least squares. The weights are determined on the basis of the conditional standard errors of a GARCH(1,1) model estimated on the residuals of the OLS regression with the 'regime' shift for 1980 incorporated. In the quarterly monetary base model all observations before 1979.4 and between 1988.1 and 1989.3 are given a weight of 1/9, all other observations have weight 1. In the yearly monetary base model all observations before 1975.1, between 1978.2 and 1981.2, and between 1988.2 and 1989.3 enter with a weight of 1/9, all other observations have weight 1. In the yearly money supply model observations between 1980.1 and 1981.1, and between 1988.1 and 1989.3 have a weight of 1/4, all other observations have weight 1.

In both quarterly models the lagged dependent variable is dropped, but only after it is also found to be insignificant in the regressions including the electoral cycle variables.

Then the electoral variables are added to these models one at a time. Table 7 presents the estimation results for all four models. In order to preserve space only the coefficients for the electoral cycle variables and their associated p values are reported. Coefficients of the other control variables do hardly change as a result of the inclusion of the electoral variables. And the overall fit of the model (measured by adjusted R^2) does not improve.

Estimation results for the reaction functions are not supportive of the election cycle hypotheses. ECV2 is significant (at the ten percent level) in the yearly M1 model, but it shows the wrong sign. No meaningful comparison between 'pre-rational' and rational expectations models, and between the 16-quarter cycle models and the ones that simply imply effects near (before) the election can be made.

Table 7: Estimation Results for Reaction Functions

	Dependent variables			
	Quarterly growth rate of monetary base[a]	Yearly growth rate of monetary base[b]	Quarterly growth rate of money supply M1[c]	Yearly growth rate of money supply M1[d]
Electoral cycle variable	Coefficient (p value)	Coefficient (p value)	Coefficient (p value)	Coefficient (p value)
ECV1	0.0026 (0.4655)	0.0027 (0.6315)	-0.0027 (0.5475)	-0.0045 (0.4459)
ECV2	0.0031 (0.3349)	0.0045 (0.3802)	-0.0017 (0.6825)	-0.0085* (0.0981)
ECV3	0.0043 (0.1716)	0.0067 (0.1937)	-0.0010 (0.8079)	0.0014 (0.7803)
ECV4	-0.0033 (0.5059)	-0.0066 (0.3465)	-0.0026 (0.6843)	-0.0029 (0.6723)
ECV5	0.0018 (0.6480)	0.0014 (0.8117)	-0.0012 (0.8102)	-0.0016 (0.7991)
ECV6	0.0023 (0.4996)	0.0037 (0.5028)	-0.0002 (0.9565)	-0.0067 (0.2142)
ECV7	0.0047 (0.2029)	0.0008 (0.8677)	-0.0029 (0.5195)	-0.0009 (0.8587)
ECV8	0.0002 (0.8253)	0.0001 (0.8996)	-0.0004 (0.6244)	-0.0014 (0.1846)
ECV9	0.0002 (0.7244)	0.0003 (0.6848)	0.0002 (0.7663)	-0.0003 (0.6796)
ECV10	0.0002 (0.7387)	0.0003 (0.7335)	-0.00003 (0.9574)	-0.0008 (0.2646)

All models include the variables listed in the text as additional regressors. Both quarterly models include three saisonal dummies (which are also allowed to change across the two subperiods), but no lagged dependent variables. [a] weighted LS results with all observations before 1979.4 and between 1988.1 and 1989.3 given a weight of 1/9, all other observations having weight 1; [b] weighted LS results with all observations before 1975.1, between 1978.2 and 1981.2, and between 1988.2 and 1989.3 having a weight of 1/9, all other observations have weight 1; [c] OLS results; [d] weighted LS results with observations between 1980.1 and 1981.1, and between 1988.1 and 1989.3 given a weight of 1/4, all other observations having weight 1; * significant at 10 percent level.

b) Evidence from Autoregressive Model Specifications

The electoral variables are also tested in the context of an autoregressive model specification. (For examples see Alesina/Cohen/Roubini 1993, Alesina/Roubini 1992, Beck 1987 and Grier 1987)[14]. In these models money growth rates are regressed on lagged dependent variables, a constant, and the variable measuring the political business cycle. All variables are defined as yearly rates of change (thus removing seasonality). Autoregressive models containing up to 12 lag lengths are investigated. The 'best' autoregressive model - excluding the electoral variables - is chosen on the basis of the following three standard criteria: minimum standard error of the estimate (root mean square error), Akaike's information criterion, and Schwarz criterion. For the yearly monetary base model an AR(9) is chosen. For the yearly money supply model an AR(9) excluding the sixth lag is selected.[15] Formal tests do not confirm structural breaks hypothesized for 1980 and 1987 (at the ten percent level).[16] Residual analysis of these autoregressive models indicates heteroskedasticity, but no autocorrelation for the yearly monetary base model. The inefficiency of OLS is corrected using the same technique described above for the reaction functions. For the yearly money supply model no autocorrelation and no heteroskedasticity can be detected, so that results are OLS estimates.
Next, the electoral variables are added to the autoregressive models one at a time, capturing the implications of the different business cycle theories. These theories predict that money growth should be higher (immediately) before elections. Hence, coefficients on the electoral cycle variables should be positive and significantly different from zero.
Estimation results for autoregressive models using yearly rates of change for the monetary base and the money supply M1 as dependent variables are listed in table 8. For brevity only the coefficients on the electoral cycle variables are displayed. No indications for the existence of a political monetary cycle can be detected. The autoregressive models lead to the same conclusions as the reaction function approach.

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[14] Autoregressive models are based upon the assumption that money growth is generated by a covariance-stationary stochastic process that can be expressed in autoregressive form. See Alesina/Roubini 1992 668-669.

[15] Results for models including the sixth lag are almost identical.

[16] Comparing models with a structural break imposed for the beginning of 1980 with models neglecting that break yields an F statistic of 1.35 (p value 0.2241) for the monetary base model. The corresponding F statistic for the money supply model is 1.65 (p value 0.1163). Especially for the money supply model a structural break might be assumed if a higher significance level (e. g. 20 percent) is used to reduce the risk of committing a type II error.

Table 8: Estimation Results for Autoregressive Models

	Dependent variables	
	Yearly growth rate of monetary base[a]	Yearly growth rate of money supply M1[b]
Electoral cycle variable	Coefficient (p value)	Coefficient (p value)
ECV1	0.0024 (0.6360)	-0.0101 (0.1495)
ECV2	0.0061 (0.1602)	-0.0019 (0.7651)
ECV3	0.0054 (0.1984)	0.0017 (0.7686)
ECV4	-0.0040 (0.5019)	-0.0071 (0.4280)
ECV5	0.000002 (0.9996)	-0.0052 (0.4928)
ECV6	0.0046 (0.3086)	0.0027 (0.6732)
ECV7	0.0038 (0.3392)	-0.0075 (0.2163)
ECV8	0.0001 (0.9168)	-0.0009 (0.4944)
ECV9	0.0001 (0.8506)	0.0002 (0.8283)
ECV10	0.0002 (0.7212)	0.0001 (0.9488)

[a] AR(9); weighted LS results with observations between 1978.1 and 1980.3 having a weight of 1/16, observations between 1980.4 and 1983.1, and between 1988.2 and 1989.3 given a weight of 1/4, all other observations having weight 1; [b] OLS results for AR(9) excluding the sixth lag.

c) Evidence from Models Without Fixed Effects

Next it is argued that the monetary cycle takes a specific form for each election. A separate dummy variable is constructed for every election, assuming the cycle patterns represented by ECV6 - an

example for the Nordhaus cycle - and ECV7 - an example for the Rogoff cycle (see table 5). These dummy variables enter the regression equations, first one at a time, then all five together. (See Beck 1984 for an example.) Estimation results for reaction functions and autoregressive models are listed in tables 9 and 10. Again, coefficients for the other variables included in the regressions are not displayed.

The variable representing the Nordhaus-type cycle (ECV6) is significant for the 1979 election in both yearly reaction function models. The variable measuring the Rogoff-type cycle (ECV7) is significant for the 1987 election in the monetary base growth models. Results for these two elections only are consistent with the predictions of political business cycle theories.

By the end of 1987 Swiss monetary policy was complicated by several factors: crash in the stock market in October, introduction of the Swiss Interbank Clearing SIC, new liquidity requirements for banks, and an appreciating Swiss franc which lead the Swiss National Bank to intervene in the exchange rate markets. The reaction functions only control for exchange rate movements, but not for the other factors. It can easily be argued that the electoral variable for 1987 simply captures aspects of these other factors. In any case, the results cannot be uniquely ascribed to elections. Hence, they cannot be interpreted as evidence supporting the hypotheses of political business cycle theories.

The results for the 1979 election may not just be due to the measurement of the yearly growth rates combined with the structural break imposed at the beginning of 1980. In late 1978, strong speculative pressure led to an appreciation of the Swiss franc against the dollar. The SNB abandoned its monetary control policy and reverted to an exchange rate target. The signal was given in the form of a Swiss franc/Deutschmark exchange rate. This exchange rate should be 'noticeably' above 80 Swiss francs for 100 Deutschmark. The massive intervention in the exchange rate market that followed generated a lot of controversy. Many observers agree that these interventions were not simply a mistake, but that the SNB yielded to political pressure. According to Capitelli/Buomberger (1990 540), for instance, the SNB ceded to pressure from the suffering Swiss export industry. Given the long recession that preceded it cannot be ruled out that the upcoming elections for Fall 1979 helped to increase the pressure on the central bank. At least it is interesting to note that the SNB did not return to monetary targeting before December 1979, just after the elections. Even if it is accepted that the events from late 1978 to December 1979 illustrate the limits of the SNB's political independence, this result is not enough to suggest the existence of a political business cycle for Switzerland.

Table 9: Estimation Results for Reaction Functions (Without Fixed Effects)

	Dependent variables			
	Quarterly growth rate of monetary base	Yearly growth rate of monetary base	Quarterly growth rate of money supply M1	Yearly growth rate of money supply M1
Electoral cycle variable	Coefficient (p value)	Coefficient (p value)	Coefficient (p value)	Coefficient (p value)
$ECV6_{75}$	0.0119 (0.5836)	-0.0246 (0.2862)	-0.0035 (0.7453)	-0.0183 (0.1704)
$ECV6_{79}$	-0.0008 (0.9632)	0.0524* (0.0722)	0.0008 (0.9301)	0.0350* (0.0515)
$ECV6_{83}$	0.0025 (0.6666)	0.0060 (0.5960)	-0.0013 (0.8785)	-0.0141 (0.2479)
$ECV6_{87}$	0.0067 (0.2380)	0.0127 (0.1780)	0.0091 (0.2878)	0.0116 (0.2640)
$ECV6_{91}$	0.0014 (0.8097)	0.0039 (0.6771)	-0.0039 (0.6586)	-0.0056 (0.5849)
$ECV6_{all}$	0.0258 (0.4407)	0.0602 (0.2261)	0.0006 (0.9790)	-0.0003 (0.9930)
$ECV7_{75}$	0.0196 (0.3164)	-0.0142 (0.1457)	0.0067 (0.4960)	-0.0023 (0.8315)
$ECV7_{79}$	0.0047 (0.6234)	-0.0143 (0.6106)	-0.0048 (0.6306)	0.0004 (0.9779)
$ECV7_{83}$	0.0051 (0.3979)	-0.0012 (0.8867)	-0.0037 (0.6889)	-0.0051 (0.5993)
$ECV7_{87}$	0.0167** (0.0383)	0.0183* (0.0631)	-0.0081 (0.3697)	0.0082 (0.5105)
$ECV7_{91}$	-0.0053 (0.3775)	0.0027 (0.7665)	-0.0017 (0.8514)	-0.0017 (0.8632)
$ECV7_{all}$	0.0410 (0.1041)	-0.0083 (0.8065)	-0.0137 (0.3553)	-0.0009 (0.9724)

See notes on table 7. The subscripts denote the election-year specific dummy variables. For $ECV6_{all}$ and $ECV7_{all}$ the sum of the coefficients of all election-year specific dummies and the corresponding p value for the joint F test are reported. * significant at the 10 percent level; ** significant at the 5 percent level.

Table 10: Estimation Results for Autoregressive Models (Without Fixed Effects)

	Dependent variables	
	Yearly growth rate of monetary base	Yearly growth rate of money supply M1
Electoral cycle variable	Coefficient (p value)	Coefficient (p value)
$ECV6_{75}$	0.0047 (0.5923)	-0.0009 (0.9432)
$ECV6_{79}$	0.0291 (0.3038)	0.0192 (0.1795)
$ECV6_{83}$	-0.0013 (0.8920)	-0.0081 (0.5450)
$ECV6_{87}$	0.0052 (0.4647)	0.0085 (0.4844)
$ECV6_{91}$	0.0081 (0.3350)	-0.0067 (0.6150)
$ECV6_{all}$	0.0583 (0.1242)	0.0167 (0.6576)
$ECV7_{75}$	0.0015 (0.8521)	-0.0098 (0.4572)
$ECV7_{79}$	-0.0347 (0.2745)	0.0007 (0.9612)
$ECV7_{83}$	-0.0014 (0.8563)	-0.0050 (0.7179)
$ECV7_{87}$	0.0176** (0.0359)	-0.0145 (0.2731)
$ECV7_{91}$	0.0016 (0.8322)	-0.0070 (0.5951)
$ECV7_{all}$	-0.0157 (0.6641)	-0.0260 (0.2533)

See notes on table 8. The subscripts denote the election-year specific dummy variables. For $ECV6_{all}$ and $ECV7_{all}$ the sum of the coefficients of all election-year specific dummies and the corresponding p value for the joint F test are reported. ** significant at the 5 percent level.

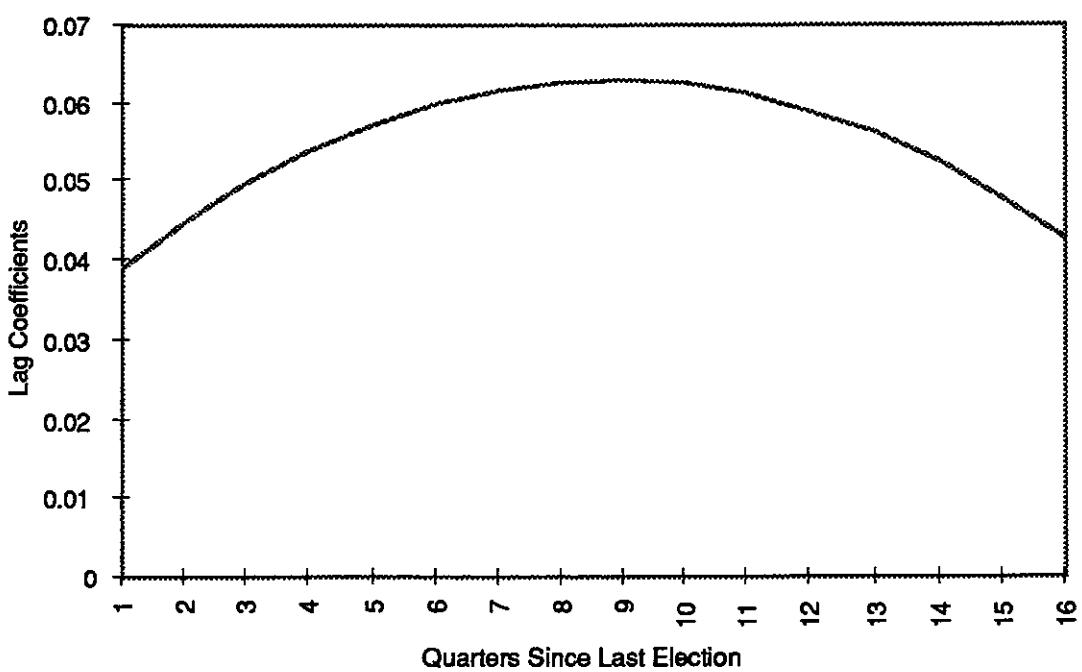
d) Free Estimation of the Optimal Cyclical Pattern

Instead of using 'manufactured' electoral variables (i.e. prespecifying the timing and the shape of the cycles) the data can be allowed to select a structure for an electoral cycle. This can be achieved by applying the Almon polynomial technique. (For a textbook exposition see e. g. Lardaro 1992 552-561.) Following Grier (1987), an electoral dummy variable that is equal to one in the quarters immediately after the elections and zero otherwise is constructed. Then a 16-quarter polynomial distributed lag is estimated on this dummy variable together with the other control variables in the reaction function or the lagged dependent variables in the autoregressive model specification. The coefficients of the lagged values of the dummy variable are assumed to lie on a polynomial of degree j. This helps to reduce the parameter space. Instead of using 16 degrees of freedom to estimate the lagged dummy variables directly, only the parameters of the polynomial function are directly estimated. (Hence, only j + 1 degrees of freedom are used, where j is the degree of the polynomial specified.) Then the lag coefficients for each quarter of the election cycle are derived from the estimated polynomial function. Tests for the degree of the polynomial indicate that - if at all - a second-degree polynomial may be appropriate for the models proposed in this paper. A 16-quarter, second-degree polynomial distributed lag is estimated for all models. Significant Almon polynomial variables are found for the yearly autoregressive money supply model only. Table 11 lists the lag coefficients estimated along with associated p values for this model. The lag distribution is graphed in Figure 2. The cycle found does not look like the cycles proposed by business cycle theory.

Table 11: Lag Distribution for the Autoregressive Money Supply Growth Model (Yearly Rates of Change)

Lag	Coefficient	p value	Lag	Coefficient	p value
1	0.04259	0.0542	9	0.06276	0.0338
2	0.04787	0.0450	10	0.06173	0.0335
3	0.05237	0.0404	11	0.05991	0.0334
4	0.05607	0.0379	12	0.05730	0.0337
5	0.05899	0.0364	13	0.05390	0.0347
6	0.06111	0.0355	14	0.04971	0.0373
7	0.06245	0.0348	15	0.04473	0.0434
8	0.06300	0.0343	16	0.03896	0.0574

Figure 2: Lag Distribution for the Autoregressive Money Supply Growth Model (Yearly Rates of Change)



6. Conclusions

The question whether monetary policy is used to help incumbents get reelected is another frequent approach to test for political influence on monetary policy. This paper tests various electoral variables as predictors of money growth in the context of reaction function models and autoregressive model specifications. These variables are consistently insignificant, and their presence or absence has no effect on the size and significance of the other variables.
Thus, the data do confirm what can be expected on theoretical grounds. The existence of a political monetary cycle is hard to rationalize in the case of Switzerland, mainly for two reasons. First, the central bank is formally independent. Second, the distribution of power in the political market place with a coalition government having a comfortable majority and the absence of any change in government since 1959 do not necessitate an electoral manipulation of monetary policy.

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