

# Political Pressure on Central Banks: The Case of the Czech National Bank

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**Summary:** As the independence of national central banks in the European Union is one of the main institutional features of the monetary constitution of the EU, the paper tries to find out whether central banks are factually independent in their decisions about interest rates if they face political pressure. The Havrilesky (1993) methodology of the political pressure on central banks is applied to the Czech National Bank, a central bank of one of the new EU Member States, in order to test whether the conducted monetary policy has been influenced by political pressure from various interest groups.

**Keywords:** political economy; monetary policy; pressure groups

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## 1. Introduction

From the institutional perspective, one of the main building blocks of the European System of Central Banks is the independence of the national central banks. Both theoretical discussion and empirical evidence showed that monetary constitution where the central bank's decision body is isolated from government when deciding about monetary policy is an effective arrangement for maintaining macroeconomic stability, one of the necessary conditions for a sustainable economic development. As a result, central banks, and not only in the European Union, are nowadays granted a large degree of independence from the political system, at least from the short-term preferences of the incumbent government.<sup>2</sup>

Nevertheless, although formally independent from politics, central banks will always remain in center of politicians' attention. The reason is that central banks, when aiming at maintenance of price stability, influence via monetary policy instruments the entire macroeconomic development, including the GDP and wage growth, which in turn may have an impact on success of different political groups in the political competition. Thus, if there is a possibility for politicians to influence current monetary policy in favor of their interests, i.e. maximization of political support and re-election chances, they will definitely use it.

Moreover, no central bank can be fully independent from the political system, as central bank – as a public institution serving for maintaining price stability, a collective good – is a part of the political system in a wider sense. Members of the central bank's decision body are usually selected via political mechanisms, appointed by one or more political, i.e. collective bodies such as parliament, government or the president. The central bank legislation, which determines the legal environment in which central bank operates, is a part of the legal system that is formed and amended by the legislative, i.e. also by political bodies.

It is clear that the two political factors – i.e. short-term re-election interests of government on one hand, and long-term interests of all members of the society regarding rules of the game of monetary policy rather than the actual conduct of it on the other hand - should be ideally separated. Nevertheless, in practice this is difficult to accomplish. As a result, there are often ways and channels through which politicians are able to influence monetary policy of formally independent central banks.

This paper follows the public choice approach to monetary policy and applies a methodology originally developed by Havrilesky (1993) for measuring political pressure on central banks and testing whether such pressure influences monetary policy. The methodology is applied to the Czech National Bank, next to the original Federal Reserve and the Deutsche Bundesbank (Maier 2002) the third central bank to which this methodology has been applied. We aim at answering the question whether there has been political pressure exercised on the Czech National Bank, and whether the bank has fallen prey to it, accommodating the revealed preferences of those executing the pressure. Using the same methodology as Havrilesky (1993) and Maier (2002) also allows some basic comparisons of all three central banks in terms of the amount of political pressure they face and their responsiveness to it.

The paper is organized as follows: section 2 shortly surveys the literature on the linkages between politics and monetary policy. Section 3 introduces and discusses the Havrilesky's methodology for measuring the political pressure, while section 4 presents the results from its application to the Czech National Bank over the period 1997-2005, including some comparisons with the U.S. Federal Reserve and the Deutsche Bundesbank. Section 5 attempts to explain the pattern of pressure on the Czech National Bank. Section 6 presents the results of several econometric tests of whether political pressure exercised on the Czech central bank influenced the conduct of monetary policy. Section 7 concludes.

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<sup>2</sup> For the issues related to independence of central banks and the effect on macroeconomic stability see Cukierman (1992) or Moser (2000).

## 2. Survey of the literature

Analyses of linkages between politics and macroeconomic policy in general have quite a long tradition within economics, especially in the public choice literature.<sup>3</sup> A natural point of departure is the so-called political business cycle (PBC) hypothesis, first empirically illustrated by Kramer (1971) and Tufte (1978) and theoretically underpinned by Nordhaus (1975). The PBC can be summarized as follows: if economic conditions before elections influence voters' choices, politicians will be aware of it and attempt to make advantage of it. As a result, economic cycles will be correlated with political cycles, with boosts before elections. Empirical evidence, as surveyed for example by Alesina and Rosenthal (1995), showed that voters in fact take into account the macroeconomic situation when voting. There is also strong empirical evidence of manipulation of economic conditions by incumbent politicians, although only indirect (i.e. that economic activity exhibit a political cycle, without discussing the channels through which politicians actually influence economic activity to their political advantage). As shown by Nordhaus (1975), if voters are not rational, incumbent government may use expansionary monetary policy as a tool and fully exhaust the trade-off embodied in the short-term Philips curve in order to boost employment at the cost of later higher inflation. Nevertheless, this model assumes that government has the monetary policy fully in control. Furthermore, empirical evidence clearly rejects the simple Nordhaus' model as regards the inflation and employment pattern, but is unclear as regards the manipulation of policy instruments.<sup>4</sup>

The simple PBC hypothesis described above is usually labeled as "opportunistic" PBC, as it disregards the importance of the party that forms government. A parallel line of research called "partisan" PBC (Hibbs 1977) assumes that different parties have different preferences over the employment versus inflation (for example because different parties may have different electorates with different sensitivities to inflation and employment), so that the pattern of economic cycle depends on which party forms the government. Empirical evidence fairly supports the partisan PBC, with usually higher economic activity during left-wing governments than during right-wing governments (at least in the U.S., see Drazen 2000).<sup>5</sup>

Political business cycle literature predicts that governments will try to use available macroeconomic policy instruments and influence economic activity in order to gain political support, especially before elections. In this respect, control over monetary policy may play a crucial role, and some authors show that governments may indeed have strong influence on actual conduct of monetary policy despite the formal independence of central banks. Havrilesky (1993) shows that decision on the U.S. monetary policy are strongly influenced by the executive branch, while Grier (1991) argues that there is a strong congressional influence on U.S. monetary policy illustrated by the fact that the leadership of the Senate Banking Committee is significantly correlated with monetary base growth. On the other hand, Wooley (1984) finds no systematic control of Congress over U.S. monetary policy, though occasionally Federal Reserve might have accommodated partisan preferences over inflation and unemployment by avoiding dramatic political actions during election periods. Studies collected in Mayer (1990) emphasize the influence of wide range of interest groups on U.S. monetary policy, including the financial sector, Fed-watchers, administration and congress. Posen (1993) focuses on the impact of financial sector on central banks' policies, while Toma and Toma (1986) present several studies that treat central banks from the perspective of the theory of bureaucracy, emphasizing the impact of reward structure of central bankers on the conduct of monetary policy.

Overall, most of the studies found that even independent central banks are in general responsive to political pressures, but the degree of responsiveness vary with the extent to

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<sup>3</sup> For a survey of literature see Toma (2001), Mueller (2003), chapter 19, or Drazen (2000), chapter 7.

<sup>4</sup> As Drazen (2000, p. 239) puts it, "the evidence for opportunistic manipulation of macroeconomic policy is stronger than for macroeconomic outcomes".

<sup>5</sup> For further surveys of PBC see Mueller (2003), p. 471.

which central banks are actually independent. Thus, the precise way of political control over central banks, including appointment procedures, the term of office etc., is the decisive factor in explaining the impact of politics on monetary policy. Lohmann (1992) and Moser (2000) show theoretically, why an independent central bank accommodates politicians' preferences when facing the threat of being overridden.

### **3. The Havrilesky's methodology and Maier's extension**

If the central bank were dependent, government could easily adjust monetary policy according to its preferences simply by implementing it by order. However, with independent central banks, politicians can only try to force the central bank to adopt their preferred policies by indirect means, i.e. by signaling the preferred monetary policy stance and threatening to use all possible levers to coerce the central bank into accommodating their wishes.

In order to be able to analyze systematically whether politicians and other interest groups exercised pressure on the central bank, and if so, how intensive the pressure was and whether the central bank succumbed to it, we need an indicator for political pressure. Such an indicator must have ideally the following properties:

- It must be able to measure the political pressure also in the period between elections. The basic PBC predicts that political pressure is usually exercised before elections, so that a proxy based on time should be sufficient. However, as governments are seeking political support of the electorate also during the whole term of office, we need an indicator independent from the election timing.
- It must indicate the direction and strength of the pressure and thus the size of the conflict between the central bank's desired policy and that of the politicians.
- It should allow for measuring the pressure from other interest groups as well, not only from the government.

In his influential study on pressure on the Federal Reserve, Havrilesky (1993) developed an indicator that fulfils the above-mentioned properties. The indicator is based on the number of newspaper reports in which politicians express preferences over a more or less restrictive monetary policy. He has counted the number of articles in the Wall Street Journal in which members of the executive branch (i.e. Administration) demanded a change in monetary policy. If an article showed that a government official called for monetary ease, it was assigned a value of +1, while an article calling for monetary tightness was assigned a value of -1. The sum of all pluses and minuses constituted the so-called SAFER index, so that for example a positive value of the SAFER index over some period indicated a "net" pressure for monetary ease (because the remaining pluses and minuses canceled each other).

When analyzing the pressure on the Deutsche Bundesbank, Maier (2002) extended the Havrilesky approach in two ways. First, he took into account also signals from other interest groups, namely from the financial sector, employers, trade unions, and others including academic researchers, international institutions and other non-specified articles demanding for change in monetary policy. The motivation for including other interest groups is to enable the disaggregating the total existing pressure with respect to the origin, and to test subsequently to which interest group's pressure the central bank responded and to which not. Second, he also introduced a new variable called public support, as some literature emphasized the role of public support for the Bundesbank as one of the decisive factors historically contributing to the factual independent conduct of monetary policy aimed at price stability (Berger and de Haan 1999). In the same way as for pressure indicator, the support indicator was constructed via counting newspaper articles with supportive statement regardless of the actual monetary policy and assigning the value of +1 to them if they expressed support.<sup>6</sup>

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<sup>6</sup> Maier (2002) also changed the sign of the value assigned to articles demanding change in monetary policy, so that articles demanding monetary ease were assigned the value of -1 and articles demanding monetary restriction

It is clear that the Havrilesky and Maier's approach to measurement of political pressure that is based on newspaper articles suffers under some drawbacks. First, it assumes that newspaper reports are representative of actual signaling from interest groups, but this does not have to be the case if there are also other channels through which politicians may signal their preferences over monetary policy (such as more informal ways through bilateral meetings, telephone calls or via other media). Second, it assumes that two articles mean twice as much pressure than one article, which need not be true. Third, the number of articles dealing with monetary policy may vary, depending also on whether there is enough news from other areas (in which case there will be probably less than average number of signals) and whether someone deliberately started a discussion about monetary policy (in which case there will be more than the average number of signals). Nevertheless, despite all the possible drawbacks, the pressure indicator based on newspaper signals may still have some value added in capturing the political pressure, given the lack of other indicators.

#### **4. Constructing the Pressure Indicator for the Czech National Bank**

In what follows, I construct the pressure indicator for the Czech National Bank (CNB), the central bank of the Czech Republic, using the Maier's extended approach based on Havrilesky (1993). In the first step the newspaper was selected: Maier (2002) lists three criteria for a suitable newspaper from which to count "pressure" articles, namely

- independence (newspaper should be politically neutral in order to avoid political bias in published articles),
- availability (the newspaper should cover reasonably long time), and
- circulation (the newspaper should be widely read, especially by central bank officials, so that signals published there in fact reach the meant receivers).

It is not easy to select a newspaper that fulfils all three criteria (so that for example for Germany Maier (2002) decided to use articles from three different German newspapers). Nevertheless, as the Czech Republic is a relatively small country, the only newspaper that systematically follows economic developments, is regularly and widely read by economists (including the central bank ones), is neutral and available since the beginning of the Czech Republic (since 1993) is the newspaper *Hospodarske noviny* ("economic newspaper"). This Czech newspaper is additionally the best candidate to serve as a natural counterpart to economic newspapers like the U.S. Wall Street Journal (selected by Havrilesky) or the German *Handelsblatt* (selected – next to two others – by Maier).<sup>7</sup>

The next step was to choose the period. As the Czech Republic practiced from the beginning of 1993 until mid-1997 an exchange rate peg (to a basket of DEM and USD, the main trading partner's currencies), the monetary policy was aimed at maintaining the exchange rate stability, aligning the Czech koruna (CZK) short-term interest rates with those on the USD and DEM. Thus, it can be argued that within the fixed-exchange rate arrangement the central bank was not actually free to pursue an independent monetary policy, so that there was no space for public discussion about "right" monetary policy stance, and thus no space for conflicts with politicians in this area.<sup>8</sup> As a result, the period after the abolition of the peg and the move to floating in May 1997 was chosen, starting hereby with June 1997 and ending with March 2005 (i.e. total of 94 months, almost eight full years).

In line with Maier (2002), I have counted articles either directly published by members of five different interest groups or where members of these interest groups were quoted. The following five pressure groups were identified:

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+1. He also - in contrast to Havrilesky (2003) – counted articles from three different German newspapers instead of only one in order to capture the pressure as broadly as possible.

<sup>7</sup> Articles in the electronic version of the archive of *Hospodarske noviny* (<http://hn.ihned.cz>) were used.

<sup>8</sup> Of course, there might have been discussion about the exchange rate and monetary regime as such, but these would be difficult to measure.

- government, which includes all ministers of the current government, but also other members of the political parties forming the government (most of them members of parliament, but some of them also outside the parliament),
- financial sector, including representatives and analysts of all domestic banks and other financial institutions (insurance corporations, pension and investment funds etc.),
- employers, i.e. representatives (managers) of non-financial corporations,
- trade unions, and
- other, including all other articles demanding change in monetary policy by other than members of the four above mentioned groups (i.e. for example from the general public, journalists, political parties in opposition, international institutions, members of academia, independent researchers etc.).

Following Maier (2002), and in contrast to Havrilesky (1993), articles demanding monetary ease were assigned the value of -1, while articles demanding monetary tightness were assigned the value of +1. This was done in order to facilitate the interpretation of the regression results in the next section. For measuring the “net” pressure, the sum of all pluses and minuses for all five interest groups and for the total was constructed at a monthly frequency, so that a negative sum indicates interest group’s net pressure for monetary ease, while a positive sum the net pressure for monetary restrictiveness.

Additionally, the ratio of the sum to total number of observations for every group and for total pressure was calculated. In comparison to the sum, the ratio has some advantageous features. First, because it relates the net pressure as measured by the sum to total number of pressure signals, it shows the degree of internal integrity of the group. Hereby it is shown whether the pressure from members of a certain interest group is going in one direction (both over time and across different members of the same group), or whether it is rather heterogeneous. Thus, for a given level of the net pressure as measured by the sum, the higher the ratio (in absolute terms), the higher homogeneity of the pressure group (both over time and over different members of the group) and the more are signals from this group going in one direction. Second, in comparison to the sum, it is independent of the time span over which the ratio is calculated. As a result, it is possible to compare the pressure as measured by the ratio across countries, even if the time coverage is different.

As the Czech economy is in contrast to the German and the U.S. one a small and open economy, it is much more sensitive to exchange rate changes. Export-oriented companies, their employees and finally also the political representatives may for example feel hit by strong exchange rate appreciation and may demand “monetary ease” by forcing the central bank to step in and to try to influence the exchange rate by other instruments than interest rates, such as by foreign exchange interventions. Thus, we extend the Havrilesky’s and Maier’s approach in that we additionally take into account articles from interest groups demanding exchange rate interventions (such that interventions aimed at weakening the Czech koruna are comparable to an interest rate decline, i.e. monetary ease, and those articles counted as -1).

#### ***4.1 The Political Pressure from Government***

In order to be able to compare all three countries for which the pressure indicator was constructed, we start with the discussion of the pressure from government (the only interest group Havrilesky (1993) took into account in his pioneering work). In any case, government is the most interesting pressure group, because it has an intrinsic motivation to exercise pressure on the central bank in order to maximize political support, as discussed above. Additionally, in contrast to the other interest groups, it may have both direct and indirect possibilities how to override central bank policy.

**Table 1: Political pressure on central banks from government**

	<b>CNB</b>	<b>FED</b>	<b>Bundesbank</b>
# signals	41	287	85
(out of all pressure signals)	22.8%	...	16.1%
period covered	1997:6-2005:3	1952:1-1991:12	1960:1-1998:12
(number of months)	94	480	468
# signals per year	5.2	7.2	2.2
# signals for monetary ease	41	192	78
# signals for monetary restrictiveness	0	95	7
sum (net pressure; minus=ease)	-41	-97	-71
ratio (sum / # signals, in %)	-100%	-33.8%	-83.5%

Source: Author's calculations based on hn.ihned.cz; Havrilesky (1993); Maier (2002).

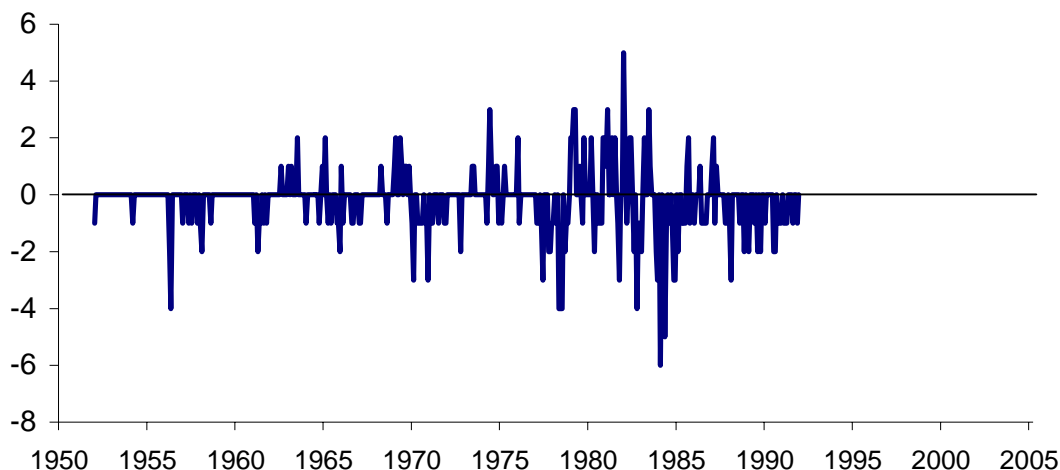
Table 1 shows that there are differences among the three countries as regards the way government puts pressure on the central bank. First, the intensity with which government asks for change in monetary policy differs. The number of signals from the government was much higher in the American case (on average around seven signals per year) than in the German case (just around two signals per year), despite the fact that pressure signals were collected from three newspapers in Germany, but just from one in the U.S. The Czech government lies in terms of the number of pressure signals between these two countries, with on average five signals per year. As regards the striking difference between the U.S. and the German case, Maier (2002, p. 80) offers two possible explanations: first, German newspapers may simply report less on monetary issues, and second, German government and also the public appreciates the Bundesbank's policies, so that there is less conflict between the government and the Bundesbank. For the Czech case, the relatively high frequency of signaling from government indicates quite a high degree of conflict between government and the CNB, which may be explained by the economic development over the analyzed time and the government's belief that CNB was responsible for possible adverse developments and that it has and should use its instruments to reverse it.

Second, as the number of signals for monetary ease and contraction shows, Czech government has been exclusively demanding monetary ease, the German government has been asking prevalingly for monetary ease, while the U.S. government has more frequently pushed for monetary contraction. Again, this can be explained by the underlying developments in economic variables such as inflation or GDP growth: while in Germany the inflation was on average rather low, the government might have forced the Bundesbank to use monetary policy instruments to support other macroeconomic objectives (higher GDP growth). This was probably not the case in the U.S., where the fight against high inflation in the 1970s and early 1980s was officially supported from the government. Similarly to the German case, the one-way pressure from the Czech government may have been caused by the combination of declining inflation, weak growth and still high central bank's interest rates (a detailed inspection is provided in the next section). Nevertheless, on average government rather push for monetary ease than the other way.

Third, the ratio indicates that in contrast to the Czech and German government, the U.S. administration is far less homogenous. In this regards, we might be interested whether there was heterogeneity rather across members, across time, or both.

**Chart 1: The "net" political pressure on FED from government**

("sum" of pressure signals; minus SAFER index, i.e. minus refers to demand for monetary ease)



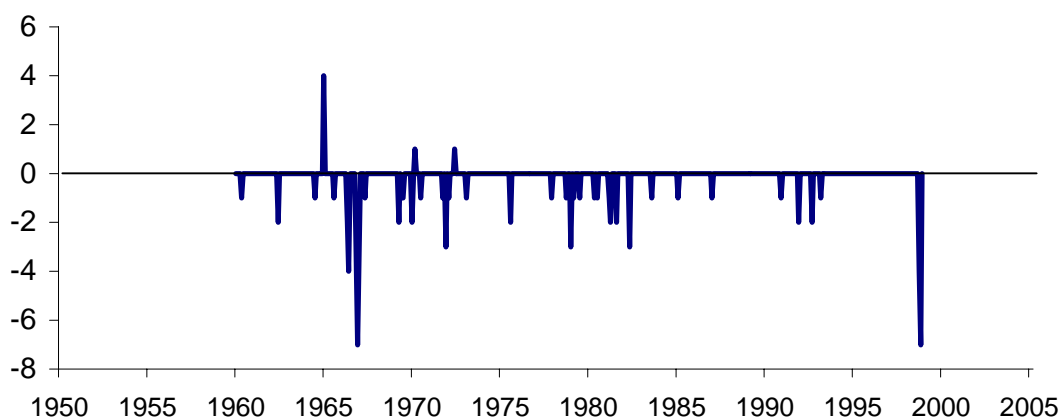
Source: Author's calculations based on Havrilesky (1993).

As the data are not available for individual members of the group “government”, we can only indirectly derive the degree of homogeneity from the time pattern of the pressure. Chart 1 shows the development of the net pressure on the Fed over time and indicates that signals of the same direction, be it for monetary ease or monetary tightness, have come in clusters in the American case. Thus, as it is rather improbable that always the same member of government signals within one time cluster, the U.S. government is probably homogenous across its members, but not necessarily across time, as it reacts with the pressure signals on economic developments in both directions.

Chart 2 shows for comparison the time pattern of the pressure from government on the Bundesbank. In line with conclusions derived from Table 1, we can now see more plastically that the “density” and frequency of signaling is indeed much lower in the German case than in the U.S. case, and that the signaling is in most cases towards monetary ease.

**Chart 2: The "net" political pressure on Bundesbank from government**

("sum" of pressure signals; minus refers to demand for monetary ease)



Source: Maier (2002), [www.philipp-maier.de](http://www.philipp-maier.de).

Finally, Chart 3 shows the development of the signaling from the Czech government on the CNB (in order to facilitate the comparison, the horizontal time axis is the same as in the two preceding cases).

**Chart 3: The "net" political pressure on CNB from government**  
("sum" of pressure signals; minus refers to demand for monetary ease)



Source: Author's calculations based on hn.ihned.cz.

Again, Chart 3 indicates that in spite of the short time span of available data, the relative frequency of signaling from the Czech government was relatively high. At the same time, however, the “peaks” in net pressure are lower than in the German and the U.S. case, indicating that the debate in newspapers on monetary issues might be frequent, but is probably less intensive in the Czech Republic. The reason might be that the Czech government considers a lower degree of signaling within a month as sufficient for effective pressure.

Finally, Table 1 shows that government does not represent the most active player in signaling. In both the Czech and German case, the number of signals from government amounted to less than 25% of all pressure signals sent to the central bank.

#### ***4.2 Total Political Pressure on CNB and its Decomposition***

Table 2 shows the total pressure on the Czech National Bank and its decomposition by interest groups, and compares it with the pressure on the Bundesbank.

**Table 2: Political pressure on central banks**

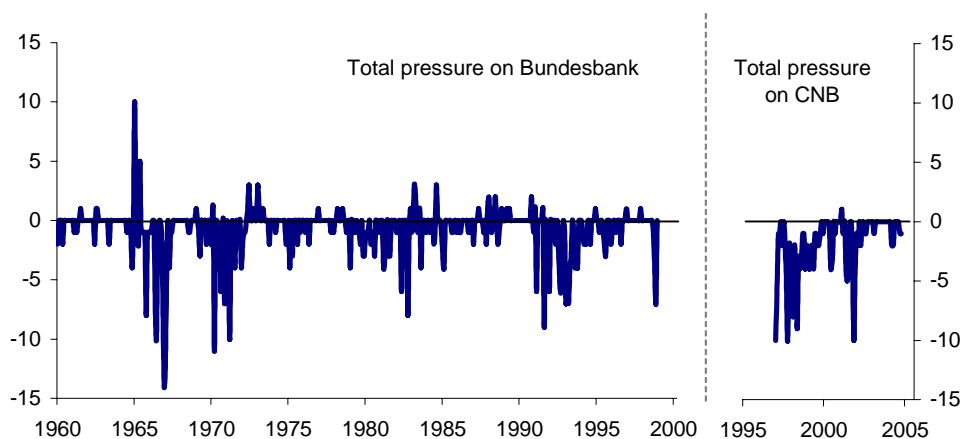
		<b>CNB</b>	<b>Bundesbank</b>
period covered		1997:6-2005:3	1960:1-1998:12
(number of months)		94	468
<b>total</b>	# signals	<b>180</b>	<b>527</b>
	(out of all pressure signals)	<b>100.0%</b>	<b>100.0%</b>
	# signals per year	<b>23.0</b>	<b>13.5</b>
	sum (net pressure; minus=ease)	<b>-166</b>	<b>-339</b>
	ratio (sum / # signals, in %)	<b>-92.2%</b>	<b>-64.3%</b>
<b>government</b>	# signals	41	85
	(out of all pressure signals)	22.8%	16.1%
	# signals per year	5.2	2.2
	sum (net pressure; minus=ease)	-41	-71
	ratio (sum / # signals, in %)	-100.0%	-83.5%
<b>financial sector</b>	# signals	40	140
	(out of all pressure signals)	22.2%	26.6%
	# signals per year	5.1	3.6
	sum (net pressure; minus=ease)	-28	-78
	ratio (sum / # signals, in %)	-70.0%	-55.7%
<b>employers</b>	# signals	36	55
	(out of all pressure signals)	20.0%	10.4%
	# signals per year	4.6	1.4
	sum (net pressure; minus=ease)	-36	-29
	ratio (sum / # signals, in %)	-100.0%	-52.7%
<b>trade unions</b>	# signals	6	69
	(out of all pressure signals)	3.3%	13.1%
	# signals per year	0.8	1.8
	sum (net pressure; minus=ease)	-6	-69
	ratio (sum / # signals, in %)	-100.0%	-100.0%
<b>other</b>	# signals	57	110
	(out of all pressure signals)	31.7%	20.9%
	# signals per year	7.3	2.8
	sum (net pressure; minus=ease)	-55	-72
	ratio (sum / # signals, in %)	-96.5%	-65.5%

Source: Author's calculations based on hn.ihned.cz; Maier (2002).

The table reveals several interesting features about the pattern of the pressure. First, the frequency of total pressure signals was on average higher in the Czech case (23 signals per year) than in the German case (13 signals per year). This confirms also the combined Chart 4.

**Chart 4: The total "net" political pressure on Bundesbank and CNB**

("sum" of pressure signals; minus refers to demand for monetary ease)



Source: Author's calculations based on hn.ihned.cz; Maier (2002), www.philipp-maier.de.

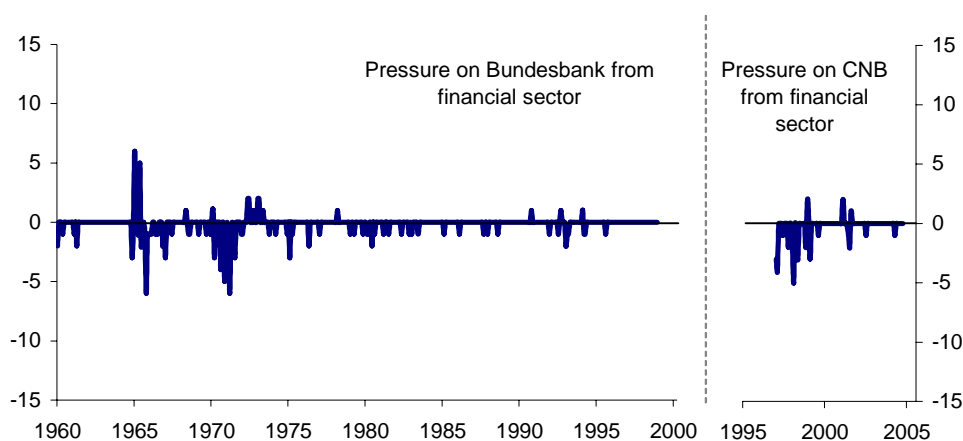
The “density” of pressure signals to CNB is comparable only to periods with frequent pressure signals in the German case, as for example with late 1960s or with early 1990s. Similarly, as in the case of pressure from government, the pressure peaks are lower on CNB than on Bundesbank, but since early 1980s, the peaks in pressure on both central banks are comparable.

Second, in both countries, the total pressure was rather towards monetary ease than restriction, but as the ratio shows, the inclination to push for monetary ease was much more prevalent in the Czech case. Looking at Chart 4, this may be explained by a too short time span, which is additionally characterized by declining inflation, so that there was simply no occasion to force the central bank to fight with rising inflation.

Third, the position of financial sector in both countries is comparable: the frequency of signaling was rather high, in both countries financial sector demanded on average rather monetary ease, slightly more in the Czech case than in the German case, given the higher ratio of pressure on CNB. Chart 5 also illustrates this.

**Chart 5: The "net" political pressure on Bundesbank and CNB from financial sector**

("sum" of pressure signals; minus refers to demand for monetary ease)



Source: Author's calculations based on hn.ihned.cz; Maier (2002), www.philipp-maier.de.

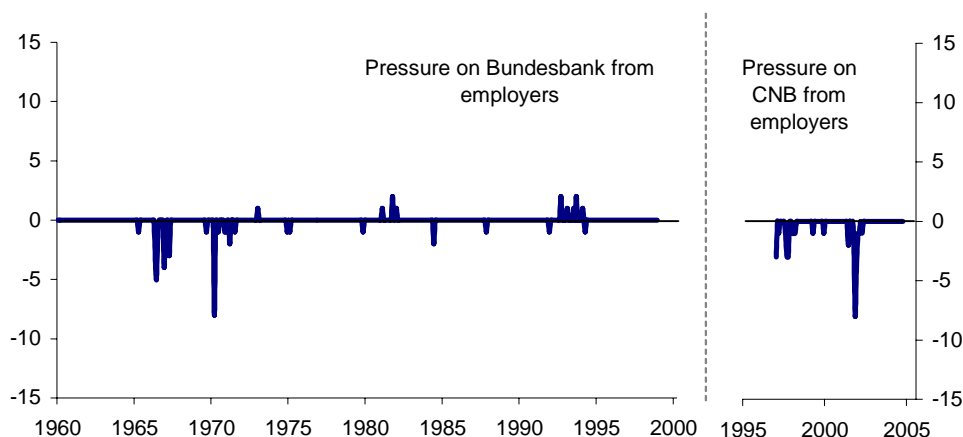
Nevertheless, from a theoretical point of view, it is surprising that financial sector pushed on average more for monetary ease, as some authors (Posen 1993) argue that financial sector represents the natural opposition against inflation and against government's attempts to force the central bank to loose monetary policy. For the Czech case, this may be mainly explained by two factors. First, bank analysts, actually next to academic members the only ones with professional knowledge of monetary issues, when regularly assessing the CNB policy, frequently added their own opinions about how the “optimal” disinflation strategy should look like. Usually, they were expressing the dislike about the too restrictive monetary policy. Second, bank officials often expressed concerns about the adverse impact of the too restrictive policy on the financial conditions of their debtors, and thus on their ability to repay existing debt. However, financial sector remains the sector with the highest number of signals towards monetary tightness, at least in the Czech Republic.

Fourth, the frequency of signaling from employers is much higher in the Czech Republic (on average around five signals per year, as compared to between one and two in Germany). Moreover, they exclusively demanded monetary ease in the Czech Republic when compared to Germany. The reason for both higher frequency of signaling and the direction of pressure is probably the orientation of most Czech companies towards export, and related sensitivity to exchange rate movements. Representatives of export-oriented companies frequently asked the central bank to “do” something with too appreciated domestic currency, effectively asking the central bank for easing the monetary conditions (i.e. the combination of interest rates and exchange rate) they faced. This contrasts with the German case. Maier (2002) disaggregated

the employers in Germany into two subgroups, the export-oriented producers, and the firms producing mainly for the domestic market, and showed that the export-oriented firms prevalingly asked for monetary ease, while the domestic-oriented firms for monetary contraction, fearing the consequences of higher inflation more than the export-oriented ones.<sup>9</sup>

**Chart 6: The "net" political pressure on Bundesbank and CNB from employers**

("sum" of pressure signals; minus refers to demand for monetary ease)

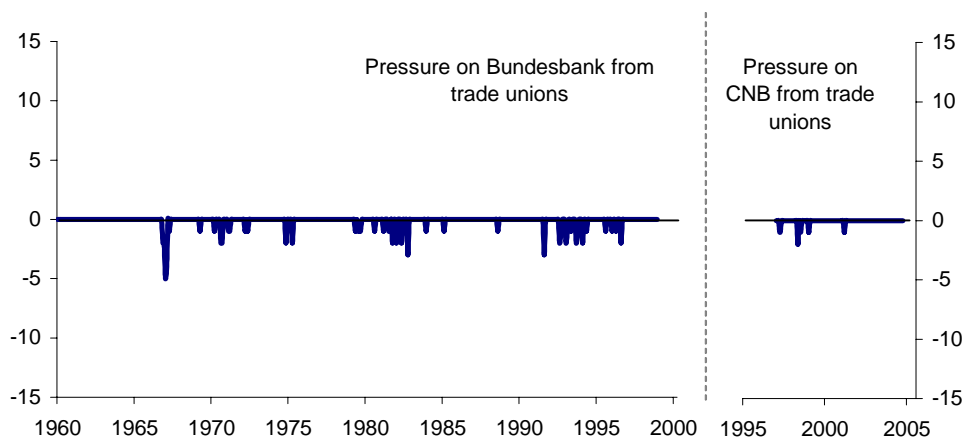


Source: Author's calculations based on hn.ihned.cz; Maier (2002), www.philipp-maier.de.

Fifth, trade unions in both countries always asked for monetary ease. Nevertheless, the frequency of signals is quite low in the Czech case (just about one signal per year, compared to around 2 per year in Germany), and also the share of signals from trade unions in the total number of signals is much lower in the Czech case, pointing to low activity of labor union members in signaling. The main reason might be the political constellation in the Czech Republic where between 1998 and 2005 the government was formed by social democrats (in 1998-2002 alone, 2002-2005 in a coalition), a natural ally of labor unions. Thus, the union members probably did not have to express their preferences for a change in monetary policy so frequently, as they were in line with the government's pressure direction and probably considered it as sufficient.

**Chart 7: The "net" political pressure on Bundesbank and CNB from trade unions**

("sum" of pressure signals; minus refers to demand for monetary ease)



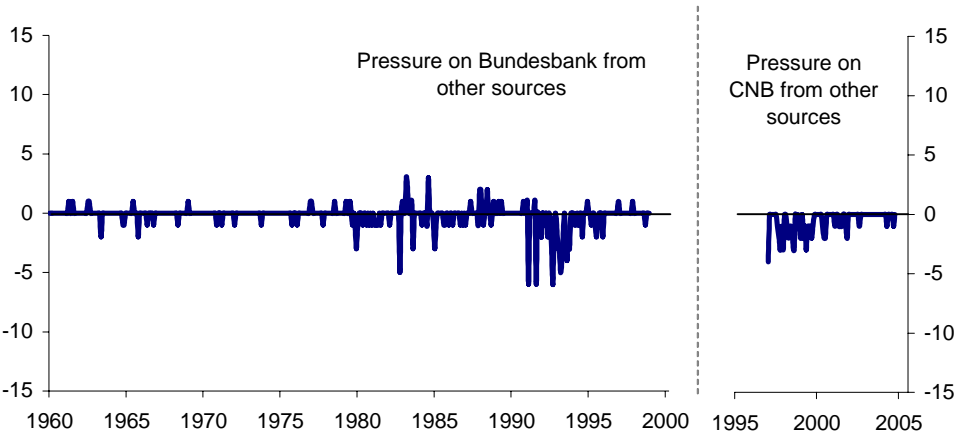
Source: Author's calculations based on hn.ihned.cz; Maier (2002), www.philipp-maier.de.

Finally, other groups, including journalists, members of academia, politicians from non-government parties, international institution representatives, and the general public, were very

<sup>9</sup> Out of 55 signals from German employers, 32 (i.e. around 60%) were export-oriented firms. The domestic-oriented producers were additionally the only group with small but positive ratio (4.3%), demanding on average rather monetary tightness than ease (see Maier 2002, p. 84).

active in the Czech case. The high share of signals in total signals (more than 30%) and high frequency of signaling (about seven signals per year) make this “residual” group the most active group of all. The reason may be the heterogeneous composition of the group, and the much easier access of journalists to newspapers (the journalists of *Hospodarske noviny* have naturally their regular article where they frequently commented, assessed and hereby also put pressure on the central bank). Interestingly, the direction of pressure was much more homogeneous in the Czech case (ratio of -96.5%), indicating that even the general perception of the then monetary policy was probably similar across the whole spectrum of pressure groups.

**Chart 8: The "net" political pressure on Bundesbank and CNB from other sources**  
 ("sum" of pressure signals; minus refers to demand for monetary ease)



Source: Author's calculations based on [hn.ihned.cz](http://hn.ihned.cz); Maier (2002), [www.philipp-maier.de](http://www.philipp-maier.de).

**4.3 The Role of Support for Monetary Policy**

Following Maier (2002), an indicator for measuring political support for the Czech National Bank was constructed. As he argues, political support may contribute to the factual independence of central banks: if the central bank faces political pressure for a change of monetary policy, but at the same time enjoys support for its current monetary policy, the pressure may be partly eliminated and the central bank may continue in pursuing its “optimal”, on economic fundamentals based policy.

The support indicator was constructed similarly to the pressure indicator, by counting articles expressing support for current monetary policy, regardless of the actual monetary policy stance. Those articles were counted as +1. The same pressure groups were identified.

Table 3 shows the results in comparison with the support for the Deutsche Bundesbank. If not differentiating between pressure groups, the frequency of support signals is slightly higher in the Czech case (around 11 support signals per year, as compared to 8 signals for Bundesbank). This may be explained by higher frequency of expressing support from the financial sector and from others, including the general public. Thus, the CNB enjoyed relatively high public support, even slightly higher than in Germany where this factor is usually counted as one of the main factors contributing to successful monetary policy. On the other hand, the CNB enjoyed quite low and infrequent support from government when compared to the Bundesbank, relatively low support from employers, and even no support from trade unions.

The ratio of number of support signals to the number of pressure signals shows the degree of homogeneity within groups. The ratio is comparable between both countries when computed from the total figures (between 50% and 60%), but it reveals several interesting features for the individual pressure groups. First, we would expect that if members of a pressure groups share common interests, they would probably signal towards the central bank in a homogenous way. This appears not to be confirmed by the data, as for most pressure groups

the ratio is relatively high. The ratio around 100% indicates that there is an intensive debate within the group, as approximately the same number of signals is sent demanding change in monetary policy as the number supporting the current monetary policy. The ratio much higher would indicate that the group is rather supporting the central bank, while a very low ratio indicates that the group is rather putting pressure on a change in monetary policy.

**Table 3: Political support for central banks**

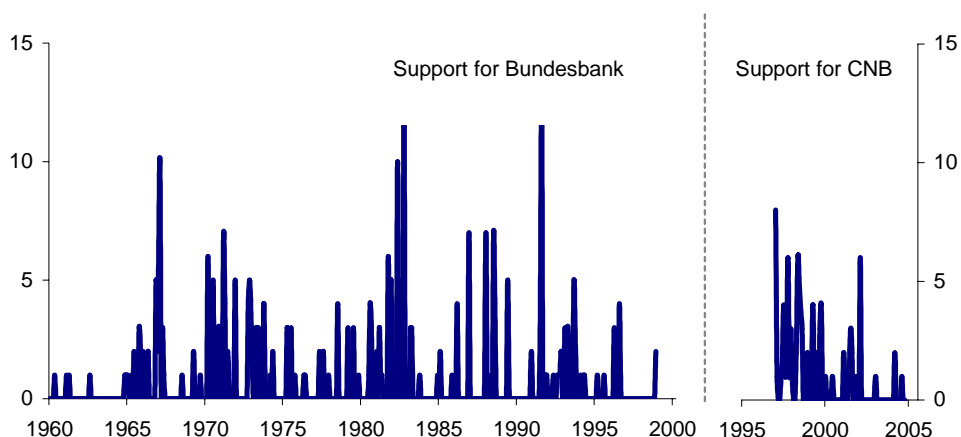
		<b>CNB</b>	<b>Bundesbank</b>
period covered		1997:6-2005:3	1960:1-1998:12
(number of months)		94	468
<b>total</b>	# support signals	<b>90</b>	<b>311</b>
	(out of all support signals)	<b>100.0%</b>	<b>100.0%</b>
	# support signals per year	<b>11.5</b>	<b>8.0</b>
	ratio # support / # pressure	<b>50.0%</b>	<b>59.0%</b>
<b>government</b>	# support signals	8	90
	(out of all support signals)	8.9%	28.9%
	# support signals per year	1.0	2.3
	ratio # support / # pressure	19.5%	105.9%
<b>finan. sector</b>	# support signals	36	111
	(out of all support signals)	40.0%	35.7%
	# support signals per year	4.6	2.8
	ratio # support / # pressure	90.0%	79.3%
<b>employers</b>	# support signals	4	59
	(out of all support signals)	4.4%	19.0%
	# support signals per year	0.5	1.5
	ratio # support / # pressure	11.1%	107.3%
<b>trade unions</b>	# support signals	0	6
	(out of all support signals)	0.0%	1.9%
	# support signals per year	0.0	0.2
	ratio # support / # pressure	0.0%	8.7%
<b>other</b>	# support signals	42	45
	(out of all support signals)	46.7%	14.5%
	# support signals per year	5.4	1.2
	ratio # support / # pressure	73.7%	40.9%

Source: Author's calculations based on hn.ihned.cz; Maier (2002), www.philipp-maier.de.

Table 3 indicates that the ratio of support to pressure is higher than 100% in the case of German government, so that German government supported the Bundesbank rather than demanded change in the policy. This is a bit surprising, as it does not correspond to the traditional models of conflict between government and the central bank, as described in the theoretical literature. However, the low support of the CNB from the Czech government, indicated by the low ratio, again supports the theoretical literature. The highest support relative to pressure received the CNB from the financial sector (ratio of 90%) and from other, unspecified groups (74%).

For further illustration, Chart 9 shows the time pattern of the support for both the Bundesbank and the CNB. The chart confirms the conclusions of Table 3, especially those of the relatively high density of support signals. In addition, Chart 9 also indicates that the peaks in support were in general higher in the case of Bundesbank, which may stem from the higher number of newspapers from which the signals were counted in the German case. All in all, however, the support for the Czech National Bank seems to be quite significant and at least comparable to the support for the Bundesbank.

**Chart 9: The total political support for Bundesbank and CNB**  
(number of support signals)



Source: Author's calculations based on hn.ihned.cz; Maier (2002), www.philipp-maier.de.

A detailed inspection of Chart 9 and its comparison with Chart 4 suggests that there might be a relationship between pressure and support, as the periods with high pressure appear to correspond with periods with high support. More in general, discussions of monetary policy issues in the newspapers seem to come in clusters, probably starting with an introductory contribution that triggers further articles, both pressure and supportive ones.

In order to test the above hypothesis formally in the case of the CNB, we first construct a variable *abs\_pressure* that equals the absolute value of the total net pressure. The correlation of monthly values between *abs\_pressure* and *support\_total* is quite high (0.55). Subsequently, we apply the Granger causality test to the monthly series of both variables.<sup>10</sup>

**Table 4: Pairwise Granger Causality Tests**

Sample: 1997:06 2005:03; monthly data; Lags: 4.

Null Hypothesis:	Obs	F-Stat.	Prob.
SUPPORT_TOTAL does not Granger Cause ABS_PRESSURE	90	0.82	0.52
ABS_PRESSURE does not Granger Cause SUPPORT_TOTAL		3.60	0.01

Table 4 shows that the correlation runs from pressure to support, i.e. articles demanding change in monetary policy triggered public support for existing monetary policy, a result that is in line with the findings on the Bundesbank (Maier 2002, p. 105).<sup>11</sup>

## 5. Explaining the Political Pressure on the Czech National Bank

We have already mentioned several times the reasons for a specific pattern or direction of pressure on monetary policy from different interest groups. As was shown in the preceding section, support always emerged after pressure signals had emerged. But what caused the pressure to arise?

As we have seen, the pressure from all pressure groups on the CNB was rather towards monetary ease. Thus, the pressure groups regarded on average the monetary policy stance as too restrictive and harmful for their interests. In this section we explain – first in a rather anecdotic way, then also formally – when and why the monetary policy stance was considered as too restrictive by individual interest groups and how it triggered the pressure.

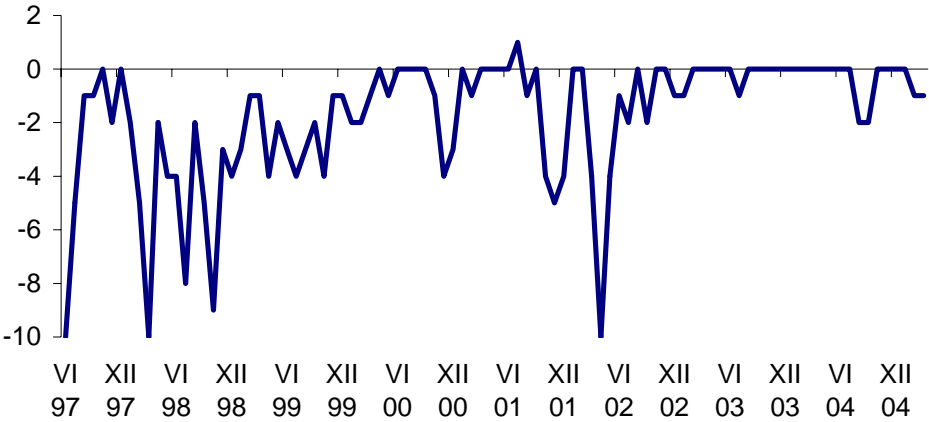
Chart 10 shows the time pattern of the total net pressure on the CNB. Three periods can be identified in which the pressure was significant: mid-1997, then the whole year 1998 (and partly also the year 1999), and finally the period between mid-2001 and mid-2002. In order to

<sup>10</sup> We also tried to perform the analysis using the daily data. The problem is, however, that daily data contain too many zeros, as on many days there was no pressure or support. This causes the Granger causality to run both ways if applied at the daily frequency of data.

<sup>11</sup> Applying different lags does not change the result of the one-way direction of influence.

explain the pressure in these three periods, we have to mention three structural factors that may have contributed to the monetary policy that have been labeled as “too restrictive” by many pressure groups.

**Chart 10: The total "net" political pressure on the Czech National Bank**  
 (pressure as measured by the "sum" of pressure signals; minus refers to demand for monetary ease)

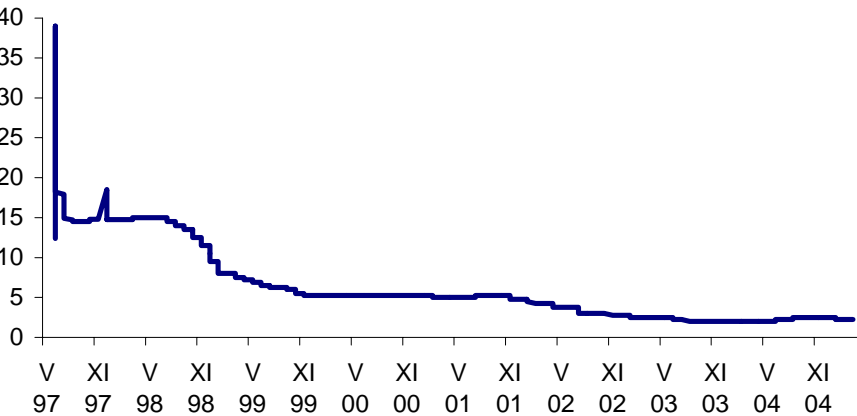


Source: Author's calculations based on hn.ihned.cz.

First, the move from the exchange rate peg to floating in May 1997 was actually forced by a small exchange rate crisis. In early 1997, markets started to doubt about the sustainability of the peg and speculated against the CZK, expecting an official devaluation, given several macroeconomic problems including rising inflation and high current account deficit of the Czech economy. Next to the move to floating, the CNB fought against the speculation by raising official interest rates to very high levels, triggering the pressure from producers, as their financing costs (interest rates applied to loans) increased substantially. The burden that domestic producers had to bear triggered also the pressure from government, as it feared the adverse effect of such a monetary restriction on the economy.

As Chart 11 shows, the CNB eventually started in the second half of 1997 and during 1998 to decrease the interest rates again, as the exchange rate stabilized (at a slightly depreciated level).

**Chart 11: Development of the 2W repo rate of the CNB**  
 (in %; the 2W repo rate is the main official rate of the CNB)



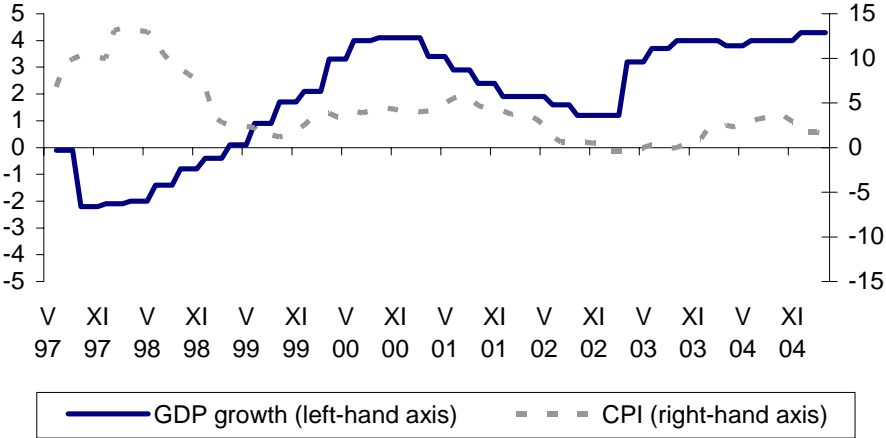
Source: CNB.

Nevertheless, the speed with which the CNB has been decreasing the interest rates was a subject of conflict between the CNB and government: the CNB feared the negative effects of depreciated exchange rate on inflation and additionally it was not sure whether the market confidence in the reached level of exchange rate had been re-established. Thus, it decreased

the interest rates rather slowly and in many small steps, effectively smoothing the movements in money market interest rates. On the other hand, government regarded the speed as too low, and pointed out that the high level of interest rates had devastating effects on the GDP growth, being ready to tolerate a slightly higher rate of inflation. Thus, the conflict was a typical representation of a conflict about the optimal point on the short-term Phillips curve.

Together with employers and government, financial sector expressed its concerns about the impact of the restriction on the health of the corporate sector, the main source of earnings for banks given the low indebtedness of households. Labor unions, in line with other groups, pushed for monetary ease, fearing the increase in unemployment given the effect of monetary restriction on the real economy. As Chart 12 shows, the GDP growth indeed declined, became negative in 1998 and early 1999, while the inflation indeed increase at the end of 1998 and in early 1999.

**Chart 12: Development of the GDP growth and inflation**  
(in %; GDP growth y-o-y, quarterly data; CPI y-o-y, monthly data)



Source: Czech Statistical Office, CNB.

Second, with loosing the fixed exchange rate as a nominal anchor of monetary policy, the CNB was in search of a new monetary regime, that was found in the inflation targeting. However, given the relatively high inflation in the period of introduction of the inflation targeting in the Czech Republic (end-1997 and early 1998), the CNB used the inflation targeting as a disinflation strategy. The aim was to bring inflation levels closer to the European levels of inflation, contributing to the nominal convergence, one of the prerequisites for the future adoption of the euro after the EU accession. Again, the speed of disinflation became a conflict issue between the government and the CNB, given the negative GDP growth between end.1997 and early 1999 and very low inflation in 1999, leading even to discussions about limiting the central bank independence in 1999 and 2000.

Third, and finally, the very open Czech economy is sensitive to exchange rate movements. The development in exchange rate became an issue in 2001-2002, as the strong appreciation caused predominantly by expected privatization revenues in euros and the need of government to change the euros in the FX market to CZK started to decrease the price competitiveness of the Czech export-oriented companies. This triggered the pressure from the employers “to do something with the exchange rate”, either by FX interventions or by cutting the official interest rates. This has of course indirectly triggered also the government reaction, as the government feared the adverse effects of problems in export-oriented industry on unemployment and the political popularity and support. Chart 13 shows the development in the exchange rate against the euro, the currency of the main trading partners of the Czech producers, illustrating the extent of the appreciation in 2001-2002.

**Chart 13: Development of the CZK/EUR exchange rate**

(pre-1999 levels calculated using CZK/DEM rate and the official irrevocable parity DEM/EUR)



Source: Bloomberg.

For a more formal analysis of the pressure on the CNB, we estimate a “pressure” reaction function of the pressure groups as a whole (total), linking the emergence and intensity of political pressure to developments in economic variables, as we have seen that the developments in the exchange rate, inflation and GDP were probably the main triggers of pressure.<sup>12</sup>

The following reaction function was estimated:

$$pressure\_total_t = c + a_1 gdp\_gap_{t-1} + a_2 \Delta er\_czkeur_t + a_3 \Delta er\_czkeur_{t-1} + a_4 \Delta cpi_{t-1} + \varepsilon_t \quad (1)$$

The main hypothesis behind the equation (1) is that the pressure for monetary ease emerges if the GDP gap is negative ( $a_1$  positive), if the exchange rate appreciates ( $a_2$  and  $a_3$  positive) and also if the inflation has a declining trend ( $a_4$  positive).<sup>13</sup> Table 5 shows the results.

**Table 5: Regression results**

Dependent Variable: PRESSURE\_TOTAL

Sample(adjusted): 1997:08 2005:03; monthly data

Method: Least Squares

Included observations: 92 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-0.77	0.19	-3.97	0.00
GDP_GAP(-1)	0.58	0.08	7.25	0.00
D_ER_CZKEUR	2.15	0.37	5.78	0.00
D_ER_CZKEUR(-1)	0.69	0.35	1.95	0.05
D_CPI(-1)	0.60	0.24	2.44	0.02
Adjusted R-squared	0.49		Durbin-Watson stat	1.44

All coefficients were positive and significant, as we have assumed. Thus, we can conclude that pressure groups are sensitive to developments in macroeconomic variables and that they generate pressure if they feel to be severely hit by macroeconomic developments that have effect on their income or survival prospects, both on economic and political markets.

## 6. Estimating the effect of political pressure on monetary policy

The preceding sections introduced an indicator for political pressure on the CNB and discussed the pattern of pressure across pressure groups and time. However, we are mainly

<sup>12</sup> Of course, individual pressure groups probably react differently or at least with different sensitivity to changes in macroeconomic variables.

<sup>13</sup> All the variables were checked to be stationary. The lag structure of the individual economic variables was set according to the significance and Akaike information criterion. The GDP gap was set to the difference between interpolated monthly values of the original quarterly GDP growth series and the growth of the potential output that was set to 3%. The estimations were done in EViews 4.1.

interested in whether political pressure had a significant impact on the CNB's monetary policy. We attempt to answer this question in two dimensions: first, we ask whether political pressure had impact on the direction of the monetary policy (restrictiveness versus ease), second, we ask whether pressure had impact on the uncertainty central bank faces when deciding on interest rate changes.

First, we conduct a simple Granger causality test in order to see whether pressure Granger caused changes in monetary policy. Table 6 shows that total net pressure had significant impact on changes in the official interest rate of the CNB, the 2W repo rate.

**Table 6: Pairwise Granger Causality Tests**

Sample: 1997:06 2005:03; monthly data; Lags: 4.

Null Hypothesis:	Obs	F-Statistic	Probability
PRESSURE_TOTAL does not Granger Cause D_CNB_REPO_EOP	89	3.93454	0.00575
D_CNB_REPO_EOP does not Granger Cause PRESSURE_TOTAL		0.52157	0.72012

We also estimated an equation relating the change in CNB repo rate to the pressure (see Equation 2):

$$\Delta cnb\_repo\_eop_t = a_1 \Delta cnb\_repo\_eop_{t-1} + a_2 pressure\_total_t + \varepsilon_t \quad (2)$$

The main hypothesis behind including the lagged change in the repo rate is that it stands for the smoothing strategy of the CNB, so that if the central bank decides to change interest rates, it makes it in small steps over several months in order to prevent abrupt changes in the money market rates. Similarly to the Granger causality test, the regression results shown in Table 7 indicate that the CNB reacted on political pressure.<sup>14</sup>

**Table 7: Regression results**

Dependent Variable: D\_CNB\_REPO\_EOP

Sample(adjusted): 1997:08 2005:03; monthly data

Method: Least Squares

Included observations: 92 after adjusting endpoints

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D_CNB_REPO_EOP(-1)	0.32	0.06	5.19	0.00
PRESSURE_TOTAL	0.05	0.01	4.45	0.00
Adjusted R-squared	0.32	Durbin-Watson stat	1.53	

Nevertheless, to conclude that the CNB succumbed to the political pressure and accommodated the wishes of the pressure groups would disregard the possibility that the CNB conducted an independent monetary policy based on economic fundamentals that, by accident or deliberately, was in line with the pressure. In other words, the estimation results in Table 7 could be spurious due to the existence of third factors that have impact on both pressure and official interest rates. Thus, we estimate a full-fledged reaction function of the CNB, including both economic variables and the pressure variable.

Within the inflation-targeting framework, a central bank adjusts official interest rates according to the forecasts of inflation and output gap, respectively. In an open economy, exchange rate plays additional key role. We also add the lagged change in the interest rates in order to take into account the "smoothing" strategy. We assume that the current values of inflation and output gap are strongly correlated with the expected values, given the frictions in the economy, so that we use the current values.<sup>15</sup> As exchange rate is difficult to forecast, we use the current value. Thus, we estimate a reaction function in the following form:<sup>16</sup>

$$\Delta pribor\_3m\_eop_t = a_1 \Delta pribor\_3m\_eop_{t-1} + a_2 \Delta cpi_t + a_3 gdp\_gap_t + a_4 \Delta er\_czkeur\_eop_t + \varepsilon_t \quad (3)$$

<sup>14</sup> Monthly data were used. The analysis was also done using 3M money market rates, but the results hardly change.

<sup>15</sup> Alternatively, current values may be used as proxies for forecasted values, as the current values of GDP and also inflation are usually not known in the current month of the decision about interest rates.

<sup>16</sup> We use 3M money market rates, as these better reflect also the near-term development in the official interest rates, in order to compensate for the bias given the use of current variables.

Table 8 shows the regression results; all the coefficients are significant, the GDP gap on the 10% level of significance, the other variables on the 5% level.

**Table 8: Regression results**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D_PRIBOR_3M_EOP(-1)	0.20	0.07	2.69	0.01
D_CPI	0.18	0.07	2.49	0.01
GDP_GAP	0.04	0.02	1.84	0.07
D_ER_CZKEUR_EOP	0.19	0.07	2.56	0.01
Adjusted R-squared	0.17	Durbin-Watson stat		2.01

Adding the pressure variable makes the *gdp\_gap* variable and the *er\_czkeur\_eop* variable insignificant, and the pressure becomes significant (see Table 9). This may be caused by the co-linearity between these two economic variables and the pressure variable, as discussed in the preceding section. As a result, we cannot conclude that the pressure is a significant variable in explaining the change in interest rates.

**Table 9: Regression results**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D_PRIBOR_3M_EOP(-1)	0.17	0.07	2.34	0.02
D_CPI	0.14	0.07	1.87	0.06
GDP_GAP	0.01	0.03	0.33	0.74
D_ER_CZKEUR_EOP	0.12	0.08	1.52	0.13
PRESSURE_TOTAL	0.05	0.02	2.02	0.05
Adjusted R-squared	0.20	Durbin-Watson stat		2.03

Thus, at the final stage, we apply a slightly modified approach: in order to get rid of the co-linearity, we decompose the pressure variable into a part that is explained by economic fundamentals and a part that remains unexplained, and use only the unexplained part of the pressure (“adjusted pressure”). For such decomposition, we can make use of the regression results in Table 5 and use residuals from the estimation of equation (1). Table 10 shows the results.

**Table 10: Regression results**

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D_PRIBOR_3M_EOP(-1)	0.19	0.07	2.61	0.01
D_CPI	0.16	0.07	2.15	0.03
GDP_GAP	0.04	0.02	1.98	0.05
D_ER_CZKEUR_EOP	0.17	0.07	2.26	0.03
ADJUST_PRESSURE	0.05	0.03	1.55	0.13
Adjusted R-squared	0.18	Durbin-Watson stat		2.07

The adjusted pressure variable appears insignificant, while the fundamentals remain significant in explaining the changes in interest rates. Thus, as a result, the pressure is correlated with the changes in official interest rates, but after controlling for economic variables on basis of which the central bank usually decides about interest rates, the pressure becomes insignificant. This indicates that the Czech National Bank, as regards the impact of pressure groups on the direction of monetary policy, did not blindly accommodate preferences of the pressure groups, but preserved its factual independence and continued to conduct monetary policy based on economic fundamentals.

However, as to the second issue we are interested in, namely that of the impact of political pressure on uncertainty that is obviously inherent in policymaking, we have to check whether there was a significant link between pressure and a proxy that would stand for uncertainty. The logic of the channel is following: if political pressure is not strong enough to induce a change in monetary policy stance, it may be sufficient to make policymakers uncertain as to whether selected change in monetary policy based on economic fundamentals is appropriate. Clearly, decision making in monetary policy is always marked by inherent uncertainty, as most of the actions taken by the central bank rely on forecasts and estimates of relevant fundamental variables. Pressure groups may take advantage of it and attempt to make the policymakers more uncertain, thus preventing the change to occur (or lowering the probability that it will occur), if they cannot reverse the direction.

We measure the uncertainty with which Czech National Bank decided about changes in official interest rates via the degree of consensus among Bank Board members when taking decisions about changes in monetary policy. Since beginning of 1998, the Czech National Bank, when publishing the minutes from the Bank Board meeting where changes in official interest rates were decided upon, reveals also how many members voted for or against the proposal that was eventually accepted (the individual names are not mentioned). Thus, we define a proxy for uncertainty as a binary variable that takes zero if the decision was unanimous (i.e. certain decision) and one if the decision was taken only with majority (i.e. uncertain decision), and we call it “uncertainty-in-decision index”. The logic is that if there is uncertainty as to the appropriate monetary policy change, the probability that individual Bank Board members will have different opinions about appropriate reaction rises.

We construct a series of the index on a monthly basis. The decisions in the sample include all possible decisions, i.e. increasing rates, decreasing them, or not changing them. In those months in which there were more Bank Board meetings with monetary policy decisions we apply a pro-uncertainty approach: if at least in one of the meetings the decision was not taken unanimously, we assign the value of one (i.e. uncertain decision). Chart 14 shows the index in comparison with the total political pressure on the CNB.

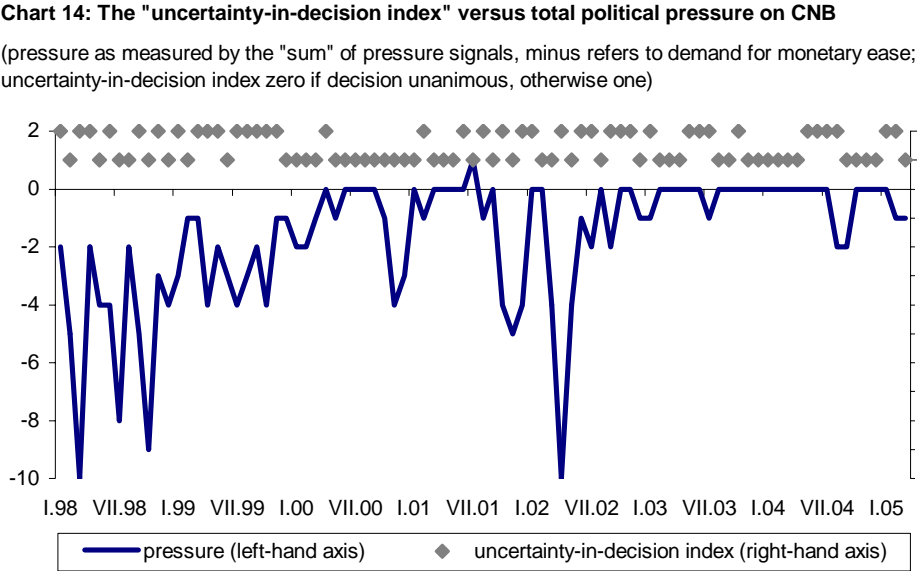


Chart 14 does not reveal any simple pattern in the relationship between uncertainty index and political pressure. From the visual inspection we could conclude that in several periods the pressure might have induced some uncertainty (the “critical” years 1998 and 2002), but in other periods the pressure does not seem to have been linked with uncertainty in decision making (the year 2003).

In order to test formally whether pressure had significant impact on uncertainty we apply a probit model, asking whether the existence of pressure (as measured by the absolute value of



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