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Interest Rate Policy Of Selected Central Banks In Central And Eastern Europe

Abstract

The aim of this article is to present and evaluate interest rate policies of three selected central banks in Central and Eastern Europe (Poland, the Czech Republic, and Hungary) from 2001 to 2013. The study consists of an introduction (Section 1) and three main parts. The introduction contains a theoretical description of the role of interest rate policy, the dilemmas connected with it, as well as an analysis of the strategies and goals of monetary policies of the National Bank of Poland (NBP), the Czech National Bank (CzNB), and the National Bank of Hungary (NBH) in the context of existing legal and institutional conditions. In turn, the first empirical part (Section 2) examines how the analysed central banks responded to changes in inflation, unemployment, and economic growth rates. The tools of the analysis are the nominal and real interest rates of those banks. The subsequent research part (Section 3) attempts to evaluate the degree of the contractionary nature of interest rate policies in specific countries in the context of the Taylor rule. The text ends with a summary (Section 4) encompassing concise conclusions drawn from the earlier analyses.

***Keywords**: monetary policy, interest rate, Taylor rule*

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1. Introduction

Monetary policy, the primary tool of which is interest rate policy, faces the difficult issue of having to constantly choose an optimum strategy. When setting the goals of monetary policy, several paths can be chosen. One of those can be characterized by lower inflation at the expense of slower economic growth, while the other – higher inflation but, at the same time, a more rapid rise in production. The choice between those two paths is often political and depends on preferences of the country's authorities and their appraisal of the country's socio-economic situation (Fedorowicz 2000, pp. 87-89).

In the European Union countries, the euro area establishment project contributed to an assumption that, in principal, the sole objective of central banks is to maintain the value of currency. Therefore, the EU member states were somehow forced to consider price stabilization to be the top priority of economic policy. That certainly may give rise to controversy as, in some countries, the socio-economic costs of that kind of disinflation policy are undoubtedly high. The countries that get caught in the "low inflation trap" are mainly those where inflation tolerance is higher and which could develop faster, were they not forced to meet the *a priori* imposed low inflation objective (Bednarczyk, Sobol 2011, pp. 36-41).

At this point, it is worth emphasizing that, according to the economic literature, various goals can be set for interest rate policy. Apart from combating inflation, they may include, among others: effective allocation of a country's economic resources (Borowiec 1994, pp. 274-275), increasing domestic savings, increasing effectiveness of investment, managing domestic demand, attracting additional foreign capital, increasing demand for financial assets (Walerysiak 1997, pp. 793-799), stabilization of the economy and stimulation of structural transformations (Nowak, Ryć, Żyżyński 1997, p. 443), and even stimulation of economic growth. Some of those goals are closely connected with the inflation objective (based on the principle of complementarity), whereas others (especially the last one) substitute, to some degree, price level stabilization.

It is worth noting, however, that even if the inflation goal is considered to be the sole aim, a high interest rate policy may, anyway, not always be the most appropriate inasmuch as high interest rates – due to the fact that their nominal level is usually set a little above the forecast inflation rate – have a stimulating impact on inflation expectations.

It should also be emphasized that the interest rate affects numerous other variables – both in the product and money market – and thus, when manipulating its level, effects may be brought about that are not always matched to expectations. Taking into account the pursuit of an interest rate policy as a tool to fight inflation, it is very important to precisely determine what kind of

factors contribute, to the largest degree, to its increase or at least maintenance at a relatively high level as, while high interest rates will actually curb inflation when it is pulled by demand, quite an opposite situation may occur when inflation is caused mainly by cost factors. This may be due to the fact that high interest rates often make enterprises taking out loans try to compensate for their considerable costs by raising the prices of their products (Żyżyński 1996, p. 101).

When analysing the effectiveness of interest rate policy, attention should also be paid to the differentiation between the short and long term, which is often omitted in the mass media but very important in economics. Expansionary monetary policy tends to bring about expected effects, but only in the short run. In turn, contractionary policy, associated with disinflation policy, often appears to be advantageous in the longer run. That is indicated, inter alia, by empirical research on the relationship between inflation, national income, and investment.[1] Therefore, while pursing an often unpopular inflation-combating policy, some short-term costs usually have to be borne in order to later be able to secure long-term advantages.

Such an assumption was taken, among others, by the European Central Bank (ECB) which, in contrast to, for example, the Federal Reserve System (the Fed) in the United States, does not practise defining several equally important goals. Pursuant to provisions of the Treaty Establishing the European Community (Article 105) the primary objective of the ECB is to maintain price stability. It is worth pointing out that similar principles apply to the entire European System of Central Banks. Due to the fact that Poland, the Czech Republic, and Hungary are all members of this System, the regulations in force in those countries and their sets of monetary policy instruments are also similar to those applicable within the whole system (Olszewska 2009, pp. 117-125).

The meeting of an *explicitly* established goal is to be facilitated by the considerable sovereignty of all national central banks of those countries which are members or candidate countries of the Economic and Monetary Union. Hence, central banks have been forbidden from taking any instructions from member state governments or community authorities who, in turn, have been prohibited from putting any pressure on those banks in their performance of their tasks (Szeląg 2003, p. 47). This separation between bodies carrying out monetary policies and those implementing fiscal policies is, in practice, designed to limit to a minimum the impact of the government (whose composition, and thus also economic policy, may be subject to frequent changes) on monetary policy making. That, in turn, is designed to give an appropriate importance to inflation-

[1] One of the most comprehensive analyses on this issue was conducted by R. J. Barro, who studied more than 100 countries over a period of about 30 years (from 1960 to 1990). The study indicates that a rise in the mean inflation rate by 10 percentage points reduces the rate of an increase in the real GDP by 0.24 percentage points annually (Barro 1996, pp. 157-159, 167-168).

combating policy, the adverse effects of which may lead, among others, to limiting the propensity to save and invest and decreasing the real income of the society.

Therefore, more and more countries adopt the so-called direct inflation targeting (DIT) strategy, while completely giving up indirect goals. Since 1998 this kind of strategy has been pursued by the National Bank of Poland and the Czech National Bank, and since 2001 – also by the National Bank of Hungary. Inflation targets set by central banks are currently: 2.5% in Poland (since 2004), 2% in the Czech Republic (since 2010), and 3% in Hungary (since 2007).[2]

Arguments for choosing an direct inflation targeting strategy in the conditions of increasing integration of the analysed economies with the global economy were, among others, the ability to publicly verify the direction and effectiveness of monetary policy as well as, associated with that aspect, enhancement of its reliability and flexibility. The target of having a monetary policy that is clearly set and understood by the public is among the pillars of the central bank's functional independence. Along with increasing the reliability of monetary policy, it may also contribute to overcoming inflation expectations (NBP 1998, pp. 8-9), being one of major factors affecting the rate of increase in general price levels.

At this point, however, the question arises whether the official announcement of pursuing a DIT strategy actually means that the sole goal of monetary policies of the analysed central banks is always to combat inflation. There is no doubt that it is a primary goal. Nevertheless, it seems that sometimes (especially when the inflation goal is not threatened and the economy falls into recession or crisis) central banks should also influence other macroeconomic variables, including economic growth and unemployment rates.

In the case of Poland such a conclusion can be drawn by, inter alia, analysing the discussions held by members of the Monetary Policy Council (the main decision-making body of the NBP) at its meetings.[3] For example, when a decision was made to lower interest rates by 25 base points in June 2009, the decision took into account, inter alia, "further slowdown in economic growth in Poland" and

[2] In previous years those targets were: in Poland – 6-8% in 2001, 5% in 2002, and 3% in 2003; in the Czech Republic – 3-5% in 2001-2004, 2-4% in 2005, and 3% in 2006-2009; in Hungary – 7% in 2001, 4.5% in 2002, 4% in 2005, and 3.5% in 2003-2004 and 2006 (www.cnb.cz; www.english.mnb.hu; www.nbp.pl).

[3] At that point it is worth mentioning that pursuant to the Act on the NBP the central bank may support the government's economic policy unless it restrains its primary, i.e. inflation-related, goal (*the Act of 29 August 1997 on the National Bank of Poland*, Article 3, Section 1, "Dziennik Ustaw" [Journal of Laws] of 2005, No. 1, Item 2).

"risk of global long-term low economic activity" (NBP 2009, pp. 44-45). On the other hand, in the months to follow rates were not cut any further due to, so the argument went, the improved prospects for economic activity (NBP 2009, p. 55).

It is worth emphasizing, however, that discussions on changes in interest rates made as a result of the economic situation were mainly focused on the fact that that situation impacts, first of all, on inflation, which can run above or below the target set by the central bank, rather than on the GDP and employment. Thus, it was considered that it was mainly through ensuring the relative stability of prices was it possible to contribute to maintaining high and lasting economic growth (NBP 2009, p. 55). The primary tool enabling central banks to do so within the DIT strategy are interest rates. Although central banks may use a variety of instruments, interest rates should be regarded as the most important among them and, at the same time, most understandable to the public.

2. Changes in Interest Rates by the Analysed Central Banks in the Context of Changes in GDP, Inflation, and Unemployment

Central banks tend to set the levels of several different interest rates – connected with both credit and deposit operations. Table 1 presents classification of basic interest rates of the European Central Bank and their counterparts applied by the national central banks in the Czech Republic, Poland, and Hungary.

Table 1. Basic central bank interest rates in the euro area, Czech Republic, Poland and Hungary

Area / Country	Marginal lending facility	Main refinancing operations	Deposit facility	Main refinancing operations minimum bid rate
Euro area	Certificates of deposits	Current account rate	Official discount rate	-
Czech Republic	Lombard rate	Repo – 2 weeks	Discount rate	-
Hungary	Overnight collateralised loan	Repo – 1 day	Deposit – 1 day	Reference rate – 2 weeks
Poland	Lombard rate	Open market operations ref. rate	Deposit rate	Rediscount rate

Source: Eurostat.

Levels of two of the most important interest rates (determining *marginal lending facility* and *main refinancing operations*) – both in nominal and real terms[4] – as compared with inflation, unemployment, and economic growth rates in the analysed countries from 2001 to 2013 are shown in Tables 2-4.

[4] Real rates were deflated with current inflation. This is justified by the relatively short maturity of sold assets.

Table 2 presents the respective data for Poland. Means of the analysed interest rates for the whole period[5] were (reference and lombard rates respectively): about 5.1% and 6.9%, and in real terms: about 2.5% and 4.2%. In turn, the mean inflation rate was about 2.8%, unemployment rate – about 13.4%, and economic growth rate – about 3.6%. Differentials within the discussed categories in specific years were usually quite considerable. In the case of inflation rate, the differential was 4.6 percentage points, real GDP growth rate – 5.6 percentage points, and unemployment rate – as much as 12.9 percentage points. In turn, the difference between the highest and lowest interest rate was: 9 percentage points in nominal terms and about 7.9 percentage points in real terms (reference rate), and 11.5 percentage points in nominal terms and about 10.3 percentage points in real terms (Lombard rate), respectively. Hence, those differentials were very large too.

Table 2. Selected macroeconomic indices in Poland from 2001 to 2013

Year	Interest rate[a]		Real interest rate[b]		Inflation rate[c]		Unemployment rate[d]	Real GDP growth rate
	A	B	A	B	A	B		
2001	11.50	15.50	7.63	11.50	5.3	3.6	18.3	1.2
2002	6.75	8.75	5.90	7.89	1.9	0.8	20.0	1.4
2003	5.25	6.75	3.59	5.07	0.7	1.6	19.8	3.9
2004	6.50	8.00	2.01	3.45	3.6	4.4	19.1	5.3
2005	4.50	6.00	3.67	5.16	2.2	0.8	17.9	3.6
2006	4.00	5.50	2.56	4.04	1.3	1.4	13.9	6.2
2007	5.00	6.50	0.77	2.21	2.6	4.2	9.6	6.8
2008	5.00	6.50	1.65	3.10	4.2	3.3	7.1	5.1
2009	3.50	5.00	- 0.29	1.16	4.0	3.8	8.1	1.6
2010	3.50	5.00	0.58	2.04	2.7	2.9	9.7	3.9
2011	4.50	6.00	0.00	1.44	3.9	4.5	9.7	4.3
2012	4.25	5.75	2.01	3.47	3.7	2.2	10.1	2.0
2013	2.50	4,00	1.89	3.38	0.8	0.6	10.3	1.6

[a] A – Open market operations reference rate; B – Lombard rate.

[b] Rounded off to two decimal places. Calculated according to the formula: real rate = (1 + nominal rate / 1 + HICP inflation rate December to December in a given year) – 1. A – Open market operations reference rate; B – Lombard rate.

[c] Measured with the Harmonized Index of Consumer Prices (HICP). A – annual average, B – December to December.

[d] Harmonized unemployment rate measured as the share of the unemployed in the civilian labour force – annual average.

Source: Own work based on: http://epp.eurostat.ec.europa.eu; sdw.ecb.europa.eu; www.nbp.pl.

[5] The provided mean values do not actually concern the whole period but only the final months in all the years.

In the Czech Republic (see Table 3), the mean nominal interest rates for the whole period were 1.9% (Repo rate) and 2.8% (Lombard rate). That meant their very low real levels – (-0.3)% for the former and 0.55% for the latter. Rate differentials were also much smaller than in Poland – 4.7 and 5.5 percentage points in nominal terms and about 4.95 and 5.75 percentage points (for the two different rates) in real terms. The mean economic growth rate, which was running at about 2.6% (with a considerable differential of 11.5 percentage points), was lower than in Poland. However, the rise in prices and lack of jobs were a slighter problem as the mean inflation rate was about 2.3% (with a 6.4 percentage point differential) and the unemployment rate – about 7% (with a slight differential of 3.9 percentage points).

Table 3. Selected macroeconomic indices in the Czech Republic from 2001 to 2013

Year	Interest rate[a]		Real interest rate[b]		Inflation rate[c]		Unemployment rate[d]	Real GDP growth rate
	A	B	A	B	A	B		
2001	4.75	5.75	0.82	1.78	4.5	3.9	8.1	3.1
2002	2.75	3.75	2.65	3.65	1.4	0.1	7.3	2.1
2003	2.00	3.00	1.09	2.08	-0.1	0.9	7.8	3.8
2004	2.50	3.50	0.00	0.98	2.6	2.5	8.3	4.7
2005	2.00	3.00	0.10	1.08	1.6	1.9	7.9	6.8
2006	2.50	3.50	0.99	1.97	2.1	1.5	7.1	7.0
2007	3.50	4.50	-1.90	-0.95	3.0	5.5	5.3	5.7
2008	2.25	3.25	-1.02	-0.05	6.3	3.3	4.4	3.1
2009	1.00	2.00	0.50	1.49	0.6	0.5	6.7	-4.5
2010	0.75	1.75	-1.52	-0.54	1.2	2.3	7.3	2.5
2011	0.75	1.75	-1.99	-1.02	2.1	2.8	6.7	1.9
2012	0,05	0,25	-2.29	-2.10	3.5	2.4	7.0	-1.0
2013	0,05	0,25	-1.43	-1.23	1.4	1.5	7.0	-0.9

[a] A – Repo rate – 2 weeks, B –Lombard rate.

[b] Rounded off to two decimal places. Calculated according to the formula: real rate = (1 + nominal rate / 1 + HICP inflation rate December to December in a given year) – 1. A – Repo rate – 2 weeks, B – Lombard rate.

[c] Measured with the Harmonized Index of Consumer Prices (HICP). A – annual average, B – December to December.

[d] Harmonized unemployment rate measured as the share of the unemployed in civilian labour force – annual average.

Source: Own work based on: http://epp.eurostat.ec.europa.eu; sdw.ecb.europa.eu; www.cnb.cz.

A considerably lower stability characterized the third analysed country – Hungary (see Table 4). It had the decidedly highest mean inflation rate (about 5.2% with a 7.4 percentage point differential). Its economic growth rate was also the lowest, at about 1.6% on average annually (with a differential of as much as 11.6 percentage points). On the other hand, it had a mean unemployment rate for

the whole period at about 8.2%; hence, the rate was lower than Poland's. Its trend, however, was definitely opposite as, apart from 2003, 2011 and 2013, the unemployment rate was constantly rising in Hungary, which made it higher than in Poland in the final six years (apart from 2013).

Table 4. Selected macroeconomic indices in Hungary from 2001 to 2013

Year	Interest rate[a]		Real interest rate[b]		Inflation rate[c]		Unemployment rate[d]	Real GDP growth rate
	A	B	A	B	A	B		
2001	9.75	11.25	2.76	4.17	9.1	6.8	5.6	3.7
2002	8.50	9.50	3.43	4.39	5.2	4.9	5.6	4.5
2003	12.50	13.50	6.53	7.48	4.7	5.6	5.8	3.9
2004	9.50	10.50	3.79	4.74	6.8	5.5	6.1	4.8
2005	6.00	7.00	2.61	3.58	3.5	3.3	7.2	4.0
2006	8.00	9.00	1.31	2.25	4.0	6.6	7.5	3.9
2007	7.50	8.50	0.09	1.02	7.9	7.4	7.4	0.1
2008	10.00	10.50	6.38	6.87	6.0	3.4	7.8	0.9
2009	6.25	7.25	0.81	1.76	4.0	5.4	10.0	-6.8
2010	5.75	6.75	1.10	2.06	4.7	4.6	11.2	1.3
2011	7.00	8.00	2.79	3.75	3.9	4.1	10.9	1.6
2012	5.75	6.75	0.62	1.57	5.7	5.1	10.9	-1.7
2013	3.00	4.00	2.39	3.38	1.7	0.6	10.2	1.1

[a] A – Repo rate – 1 day, B – Overnight collateralised loan rate.

[b] Rounded off to two decimal places. Calculated according to the formula: real rate = (1 + nominal rate / 1 + inflation rate December to December in a given year) – 1. A – Repo rate – 1 day, B – Overnight collateralised loan rate.

[c] Measured with the Harmonized Index of Consumer Prices (HICP). A – annual average, B – December to December.

[d] Harmonized unemployment rate measured as the share of the unemployed in civilian labour force – annual average.

Source: Own work based on: http://epp.eurostat.ec.europa.eu; sdw.ecb.europa.eu; english.mnb.hu.

Despite the (usually) relatively slight increase in GDP and climbing unemployment, the interest rate change analysis indicates, however, that the National Bank of Hungary did not intensely use that tool to improve the economic situation, as mean nominal interest rates from 2001 to 2013 were respectively: 7.65% (Repo rate) and 8.65% (collateralised loan rate), considerably exceeding similar rates set at the other analysed central banks. Significant reductions in relatively high interest rates occurred principally only in 2005 (probably as a response to the decline in inflation to the lowest level in the whole period) and from 2009 to 2010 (along with the global trend of lowering

rates as a reaction to the crisis). In real terms, due to the higher inflation, those rates were, however, at a level close to that observed in Poland (Repo rate – about 2.7%; "overnight" rate for collateralised loan – 3.6%).

3. Deviations in the Interest Rates of Analysed Central Banks from Hypothetical Rates According to the Taylor Rule

Interest rate policy may be discretionary or based on a rule. The most popular form of the latter is the Taylor rule, created in 1993. Its original algebraic form was as follows:

$$r = p + 0.5\,y + 0.5\,(p - 2) + 2 \qquad (1)$$

where:
r – central bank interest rate,[6] p – inflation rate in the last four quarters; y – percentage deviation of the real GDP from the potential GDP determined by the formula:

$$y = 100\,(Y - Y_p)\,/\,Y_p \qquad (2)$$

where:
Y – real GDP; Y_p – potential real GDP.

The author of the rule – Taylor – based it on certain assumptions. The most important of those was that the central bank ought to assume a target inflation level (inflation goal) and try to maintain it. Moreover, monetary policy should respond to changes in two basic values – real gross domestic product and inflation, which directly arises from the formula.

If the real GDP equals the potential GDP (understood as many years' mean) and inflation equals a goal set at 2% (thus, *y* and *p – 2* in the formula (1) equal zero), the central bank interest rate should remain close to 4%, which implies the mean real interest rate of 2% (which is reflected by the last component on the right side of the equation) (Taylor 1993, p. 202). That rate, on the other hand, should be increased or reduced when the GDP deviates from its potential level and/or inflation deviates from the goal. If, for example, the real GDP rises by one per cent above the potential GDP, the interest rate should be raised – taking into account the current inflation rate – by 0.5 percentage point. If, additionally, inflation exceeds the goal by 1 percentage point, the interest rate should, due to that fact, be lifted by another 0.5 percentage point. Therefore, the optimum level of interest rate according to the Taylor rule ought to be 5% in the above discussed example.

[6] In the original formula it was the rate of federal funds as the proposal originally concerned the US.

Of course, values of coefficients for deviations may be set a little differently than in the original formula. For instance, in analyses concerning Europe, where, principally, the sole legally sanctioned objective of monetary policy is to combat inflation, a deviation of the latter is, as a rule, given more importance than the GDP gap (Giammarioli, Valla 2003, p. 12; Fernandez, Gonzalez 2004, p. 23-25). In such a case, the monetary policy rule could take the following form:

$$r = p + 0.5\,y + 1.5\,(p - 2) + 2 \tag{3}$$

Thus, the only difference would be the value of the coefficient assumed for the deviation of the actual inflation rate from the goal.

Table 5. Real vs. potential interest rate (according to the Taylor rule) in Poland from 2001 to 2013

Year	Interest rate calculated based on the Taylor rule[a]		Deviation of the open market operations reference rate from the rate calculated based on the Taylor rule[ab]		Lombard rate deviation from the rate calculated based on the Taylor rule[ab]	
	A	B	A	B	A	B
2001	5.25	3.55	+6.25	+7.95	+10.25	+11.95
2002	1.25	-1.85	+5.50	+8.60	+7.50	+10.60
2003	1.70	-0.60	+3.55	+5.85	+5.05	+7.35
2004	7.00	8.10	-0.50	-1.60	+1.00	-0.10
2005	4.05	3.75	+0.45	+0.75	+1.95	+2.25
2006	4.00	2.80	0.00	+1.20	+1.50	+2.70
2007	6.25	6.35	-1.25	-1.35	+0.25	+0.15
2008	7.80	9.50	-2.80	-4.50	-1.30	-3.00
2009	5.75	7.25	-2.25	-3.75	-0.75	-2.25
2010	4.95	5.15	-1.45	-1.65	+0.05	-0.15
2011	6.95	8.35	-2.45	-3.85	-0.95	-2.35
2012	5.50	6.70	-1.25	-2.45	+0.25	-0.95
2013	0.95	-0.75	+1.55	+3.25	+3.05	+4.75

[a] In version A, calculated assuming the coefficient for inflation deviation from the target at 0.5; in version B – at 1.5.

[b] In percentage points. The "+" sign means an upward deviation; the "–" sign means a downward deviation.

Source: Own work based on formulas 1 and 3 and Table 2.

Tables 5-7 compare real interest rates at the analysed central banks with hypothetical rates computed according to the Taylor rule. The latter were calculated in two versions. In the first version, it was assumed that the coefficient for inflation deviation from the goal is 0.5 and in the other (which, as already mentioned, may be more appropriate for Europe) – 1.5. The mean annual HICP inflation rate was considered the inflation measure for the last four quarters.

Table 6. Real vs. potential interest rate (according to the Taylor rule) in the Czech Republic from 2001 to 2013

Year	Interest rate calculated based on the Taylor rule[a]		Deviation of the Repo rate – 2 weeks from the rate calculated based on the Taylor rule[ab]		Lombard rate deviation from the rate calculated based on the Taylor rule[ab]	
	A	B	A	B	A	B
2001	7.25	7.75	-2.50	-3.00	-1.50	-2.00
2002	1.60	-1.00	+1.15	+3.75	+2.15	+4.75
2003	1.05	-3.05	+0.95	+5.05	+1.95	+6.05
2004	6.00	4.60	-3.50	-2.10	-2.50	-1.10
2005	7.10	5.70	-5.10	-3.70	-4.10	-2.70
2006	8.05	7.15	-5.55	-4.65	-4.55	-3.65
2007	8.10	8.10	-4.60	-4.60	-3.60	-3.60
2008	10.45	13.75	-8.20	-11.5	-7.20	-10.50
2009	-5.70	-8.10	+6.70	+9.10	+7.70	+10.10
2010	2.70	1.90	-1.95	-1.15	-0.95	-0.15
2011	3.45	3.55	-2.70	-2.80	-1.70	-1.80
2012	2.65	4.15	-2.60	-4.10	-2.40	-3.90
2013	-0.40	-1.00	+0.45	+1.05	+0.65	+1.25

[a] In version A, calculated assuming the coefficient for inflation deviation from the target at 0.5; in version B – at 1.5.

[b] In percentage points. The "+" sign means an upward deviation; the "-" sign means a downward deviation.

Source: Own work based on formulas 1 and 3 and Table 3.

Furthermore, instead of a percentage deviation of the real GDP from the potential GDP, deviation of the actual growth rate of the real GDP from the mean rate for the whole 13 years' period was taken into account. As already mentioned, the mean rates for the analysed countries were (in round figures): in Poland – 3.6%, in the Czech Republic – 2.6%, and in Hungary – 1.6%. Also, actual inflation targets were assumed, slightly different from those in the formula presented in the previous point. Thus, instead of p – 2, for Poland, the third component of the discussed formula contained the following expressions:

p – 7 (for 2001), *p – 5* (for 2002), *p – 3* (for 2003), and *p – 2.5* (for 2004-2013).

For the Czech Republic, the following expressions were used in calculations:

p – 4 (for 2001-2004), *p – 3* (for 2005-2009), and *p – 2* (for 2010-2013).

In turn, for Hungary, those were:

p – 7 (for 2001), *p – 4.5* (for 2002), *p – 3.5* (for 2003-2004 and 2006), *p – 4* (for 2005), and *p – 3* (for 2007-2013).

Those differences arise from different inflation goals assumed by the analysed central banks in the specific years (see Section 1).

Table 7. Real vs. potential interest rate (according to the Taylor rule) in Hungary from 2001 to 2013

Year	Interest rate calculated based on the Taylor rule[a]		Deviation of the Repo rate – 1 day from the rate calculated based on the Taylor rule[ab]		Deviation of the "overnight" rate for collaterised loan from the rate calculated based on the Taylor rule[ab]	
	A	B	A	B	A	B
2001	13.20	15.30	-3.45	-5.55	-1.95	-4.05
2002	9.00	9.70	-0.50	-1.20	+0.50	-0.20
2003	8.45	9.65	+4.05	+2.85	+5.05	+3.85
2004	12.05	15.35	-2.55	-5.85	-1.55	-4.85
2005	6.45	5.95	-0.45	+0.05	+0.55	+1.05
2006	7.40	7.90	+0.60	+0.10	+1.60	+1.10
2007	11.60	16.50	-4.10	-9.00	-3.10	-8.00
2008	9.15	12.15	+0.85	-2.15	+1.35	-1.65
2009	2.30	3.30	+3.95	+2.95	+4.95	+3.95
2010	7.40	9.10	-1.65	-3.35	-0.65	-2.35
2011	6.35	7.25	+0.65	-0.25	+1.65	+0.75
2012	7.40	10.10	-1.65	-4.35	-0.65	-3.35
2013	2.80	1.50	+0.20	+1.50	+1.20	+2.50

a In version A, calculated assuming the coefficient for inflation deviation from the target at 0.5; in version B – at 1.5.

b In percentage points. The "+" sign means an upward deviation; the "-" sign means a downward deviation.

Source: Own work based on formulas 1 and 3 and Table 4.

The presented analysis of deviations of the studied countries' specific interest rates from rates determined based on the Taylor rule allows us to conclude that a relatively mild monetary policy, for most of the analysed period, can be observed only in the case of the CzNB as, apart from 2002, 2003, 2009 and 2013, actual interest rates in the Czech Republic were lower than the hypothetical ones according to the Taylor rule. A particularly large difference between them occurred in 2008.

It is also worth mentioning that both the real Repo rate for 2-week operations and the real Lombard rate became even negative from 2007 to 2013 (apart from 2009). Hence, that may indicate an actually excessively expansionary nature of the CzNB policy in those subperiods. It should be emphasized, however, that essentially the bank did not make abrupt changes in interest rates. The sole exception from the rule was its reaction to the crisis from 2009 to 2010, resulting in the nominal Repo rate at as little as 0.05% at the end of the studied period.

A different attitude and more contractionary monetary policies were observed in Poland and Hungary. In Poland, however, that applied mainly to the initial years of the studied period. Comparison between actual NBP interest rates and rates calculated according to the Taylor rule indicates that the former ran at a significantly higher level in the 2001-2003 period. It is also worth recalling that, at that time (2002-2003), the inflation rate deviated downward below the lower margin of the goal, economic growth rate was relatively the lowest, and unemployment rate was the highest throughout the studied period. Therefore, it can be said that at the beginning of the studied period interest rates in Poland, although regularly lowered, should have been cut faster and the monetary policy was too contractionary.

In the subsequent several-year subperiod of 2004-2006 NBP interest rates were decidedly closer to the hypothetical rates according to the Taylor rule. That may indicate a significantly more neutral nature of the monetary policy pursued at that time.

Yet another conclusion can be drawn about that policy in Poland in the final seven years of the studied period. It seems that at that time, thanks to its neutral attitude to interest rate policy, the National Bank of Poland managed to avoid mistakes made, for example, by the US Federal Reserve System as, in response to the economic crisis, interest rates in Poland were reasonably lowered, to run at a level higher than in the Czech Republic as well as in the euro area. In that context it should, however, be pointed out that Poland was affected by the economic crisis to the smallest degree, relatively speaking. Moreover, more drastic cuts in rates in Poland were significantly limited by a strong depreciation in the Polish zloty in 2009 (Pronobis 2009, p. 112).

That aspect aside, it ought to be emphasized that the actual NBP reference rate in the 2007-2012 period, and at the end of that period in particular, might have been even higher if compared with that computed based on the Taylor rule. Thus, it completely contradicts some opinions of politicians stating that the level of interest rates was too high in that subperiod, hampering economic growth. It should be more justified to say that the central bank succeeded in maintaining a “healthy” balance between short- and long-term objectives at that time. Admittedly, we often experienced “overshooting” the inflation target – both upwards and downwards. As a rule, however, it was not significant and inflation quickly returned to its set range.

Among the studied central banks, the highest nominal interest rates, apart from 2001, definitely occurred in Hungary. What's more, comparison of actual interest rates with those calculated based on the Taylor rule indicates that the former were frequently too high and thus, the NBH policy was excessively contractionary. In the case of the Repo rate for 1-day operations, that occurred in 2003, 2006, 2008 (according to the A version), 2009, 2011 (according to the A version) and 2013. If, however, the "overnight" rate is considered, that took place also in 2002 (according to the A version) and 2005.

Therefore, it may not be ruled out that the NBH interest rate policy contributed, to some extent, to a relatively low, as compared to the other countries, GDP growth. Some justification for that quite contractionary monetary policy was, however, firstly the decidedly highest inflation rate in Hungary among the studied countries, which fell below the assumed target only in 2005 and 2013. It is worth emphasizing that even during the crisis, which was accompanied by falling global demand, the inflation rate in Hungary fluctuated around 5%. Secondly, the contractionary monetary policy was often a response to an extremely expansionary budgetary policy[7]. Hence, to some extent, the high interest rates might have been justified as they prevented an even higher inflation. On the other hand, such a mix of macroeconomic policy causes a strong crowding out effect through a rise in all kinds of interest rates as, along with increased central bank rates, an excessive deficit makes it necessary to offer high interest on treasury bonds.

4. Conclusions

The monetary policy of every central bank is carried out in specific economic conditions. Those conditions are sometimes difficult to completely identify and understand. However, when evaluating monetary policies followed by the analysed central banks, attention should be drawn to the fact that the applicable legislation clearly specifies that their activity is to bring about beneficial economic effects in the long run. That is to be achieved by preventing an excessive rise in prices, which is currently the sole final goal of each of those banks.

The conducted analysis reveals that the studied central banks pursued that very objective to the largest extent. Thus, interest rates were changed, first and

[7] During the years 2001–2010 the public finance sector deficit in Hungary was never particularly close to meeting the Maastricht reference value of 3%. A very high level of that deficit was recorded especially from 2002 to 2006 when it ranged from 6.4% (2004) to 9.3% (2006) (http://epp.eurostat.ec.europa.eu).

foremost, in response to inflation rate changes. Taking into consideration the whole studied period, the analysed central banks seem to have avoided mistakes consisting in the excessively expansionary nature of their policies made, for instance, in the United States. One can, admittedly, wonder whether the monetary policy in the Czech Republic should not have sometimes been a little more contractionary (e.g. from 2007 to 2008). On the other hand, an opposite objection, of the excessively contractionary nature of policies, seems to be substantiated in the case of Hungary and, at the beginning of the studied period, Poland. Nevertheless, mistakes made in those countries were still smaller than in the US.

It is already possible to state with a high degree of probability that the extremely expansionary policy of the US Federal Reserve System (Fed) was co-responsible for the global 2008–2009 economic crisis. Such an opinion is actually also expressed by the author of the Taylor rule, who claims that one of the most important factors behind the crisis was the excessively expansionary interest rate policy in the US from 2002 to 2006 (especially in the 2003-2004 subperiod) as at that time the rates were set at a level considerably lower than that arising from the rule he proposed (Taylor 2007, p. 5).

The analysis conducted in this study indicates, admittedly, that the Taylor rule was not commonly applied by all of the three analysed central banks. In consequence, interest rates set by them sometimes significantly differed from the hypothetical levels determined based on the discussed rule (either exceeded or were lower than the hypothetical rates). Nevertheless, it is worth emphasizing yet again that the discretionary interest rate policies of the analysed central banks did not appear to be as erroneous as those in the US, maintaining an appropriate level of macroeconomic rationality.

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Streszczenie

POLITYKA STOPY PROCENTOWEJ WYBRANYCH BANKÓW CENTRALNYCH W EUROPIE ŚRODKOWO-WSCHODNIEJ

Celem artykułu jest przedstawienie i ocena polityki stopy procentowej trzech wybranych banków centralnych Europy Środkowo-Wschodniej (Polski, Czech i Węgier) w latach 2001–2011. Opracowanie składa się z wprowadzenia i dwóch części zasadniczych i podsumowania. We wprowadzeniu (p. 1) zawarto teoretyczny opis roli polityki stopy procentowej, dylematów z nią związanych, a także analizę strategii i celów polityki monetarnej Narodowego Banku Polskiego (NBP), Narodowego Banku Czeskiego (NBCz) oraz Narodowego Banku Węgier (NBW) w kontekście obowiązujących uwarunkowań prawno-instytucjonalnych. Z kolei w pierwszej części empirycznej (p. 2) sprawdzono, w jaki sposób analizowane banki centralne reagowały na zmiany stóp inflacji, bezrobocia i wzrostu gospodarczego. Jako instrumenty analizy przyjęto nominalne i realne stopy procentowe tych banków. W następnej części badawczej (p. 3) podjęto próbę oceny stopnia restrykcyjności polityki stopy procentowej w poszczególnych krajach w kontekście reguły Taylora. Całość zamknięto podsumowaniem (p. 4), zawierającym wnioski z przeprowadzonych wcześniej analiz.

***Słowa kluczowe**: polityka pieniężna, stopa procentowa, reguła Taylora*