0% INTEREST RATES – UPPER OR LOWER LIMIT?

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Abstract. *Choosing monetary policy strategy is an important step towards having a low and stable inflation in the context of certain economic performance. In recent years, the focus on economic policies (monetary, fiscal, competition etc.) oscillated between the approaches of right and left. These policy adjustments required to be effective in regulating the activity of economic agents.*

The current questions of today are related to measuring the effectiveness of monetary policy and the appropriateness of adopting specific measures and institutions to ensure balanced functioning of the monetary system. Several central banks conduct a monetary policy that promotes heated discussions, so that many analysts are asking on the effectiveness of the strategy to maintain interest rates at a low value and when they will reverse the trend.

This article aims to demonstrate the lack of reaction of inflation at the change of monetary policy interest rate using the example of the Bank of England (BoE). This example is representative within the European Union since the BoE monetary policy strategy is direct inflation targeting and has implemented earlier than other EU countries the quantitative easing program to control inflation.

Keywords: *monetary policy, monetary policy strategy, interest rate, inflation.*

JEL code: E52, E58, E31, E32, C87*.*

1. Introduction

Post-crisis period shows a marked reduction process of the monetary policy interest rates to unprecedented levels. The impact of such a decision of central banks (especially the influent ones) is significant in terms of consumption, savings and investment, variables whose development depends on overcoming the current period characterized by modest rates of economic growth. Clearly, the sources, especially the effects of such a

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decision provoke intense debate, both at the level of the main policy makers and academic environment.

Nominal anchor is used by monetary policy makers to set expectations on prices and private agents to convince them that the central bank aims precisely stated goal.

Kydland and Prescott (1977) were the ones who brought in the attention of the scientific community the time inconsistency problem of monetary policy. This occurs when the policy makers conduct the monetary policy in a discretionary way, and expectations of private agents are taken as given.

The main cause of inconsistency as identified by Mishkin (2004) consists of discretionary management of monetary policy by the central bank which may take attractive decisions in the short term, but inadequate on the long-term. The centre of time inconsistency problem center (Zandweghe and Wolman, 2011), is that monetary policy makers take as given the expectations of private agents, but at balance these expectations accurately incorporate the optimal behavior of decision makers.

2. Transmission mechanism of monetary policy

The transmission mechanism of monetary policy is defined as the chain channels through which the money supply affects economic activity (Fig. 1).

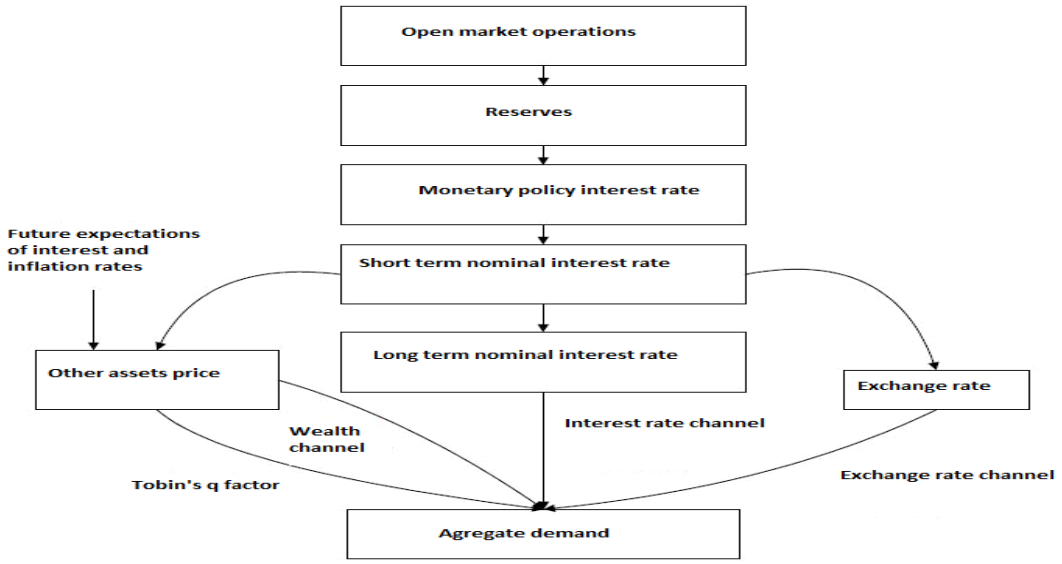

Figure 1. Transmission mechanism of monetary policy.

Source: after NBR.

The interest rate monetary policy affects interest rates on the market in varying proportions. A change in official interest rates may lead to a change in interest rates in the short term, but not necessarily in the same proportion, banks adjusting their interest rates with a short delay. Regarding the long term interest rate, not only that the adjustment is not necessarily in the same proportion, but it is possible for it not to be in the same direction: thus, according to the expectations of economic agents, an increase in the official interest rate can future lead to a decrease in long-term interest rates because they can expect in the future, the next decision on official interest rate to be one of decline.

From the monetary policy interest rate change there is a delay in adjusting interest rates on loans and deposits. This may be due to several factors (Ailenei, Balaban, 2012): moral hazard and adverse selection caused by the asymmetric information from the banking costs; switching costs for clients, and the adjustment of banks and risk distribution.

Besides the influence of the interest rate the aggregate demand is also influenced by external factors, the greatest influence being the fiscal policy.

2.1. Interest rate channel

Interest rate channel is the most significant channel of monetary policy transmission mechanism.

Interest rate channel operates through the impact of monetary shocks on the liquidity and real interest rates, which influence in turn, the aggregate demand components sensitive to interest rate changes, such as consumption and investment. According to Mishkin (1996) and Taylor (1995), although the interest rate channel is a proven transmission mechanism it cannot fully explain fluctuations in output.

When the money supply (M) increases, interest rates (r) are lower, leading to a decrease in the cost of capital and increase investment (I), thereby increasing and output (Y). Keynes described the process starts from the decisions of firms to invest and household's decisions to purchase durables are similar investment decisions of firms.

2.2. Credit channel

The credit channel works by the credit's response to changes in exchange rates and other monetary policy tools. Thus, the credit channel is an extension of the interest rate channel and amplifies the real effects of

monetary policy through changes in the credit supply of banks. The necessary condition for the operation of the credit channel is the significant role that banks have as a source of capital for the private sector, especially in emerging economies based banking system (Cevik, Teksoz, 2012). The credit channel can be divided into two different channels: channel bank credit (bank lending channel) and channel / effect balance (balance sheet channel).

A restrictive monetary policy affects the credit channel, for example by increasing the reserve ratio, resulting in a reduction of liquidity available to a commercial bank. A tight monetary policy also leads to a decrease in deposits from commercial banks because of its impact on economic activity. These factors reduce the supply of loans to commercial banks, especially small firms, thus affecting investment activity. Monetary policy affects also their balance sheets and therefore the value of their assets that can serve as collateral. Higher interest rates may reduce cash flow and can have a negative impact on financial asset prices, thus reducing the net firm and leading to lower investment expenditures. Weak balance sheets can also lead to moral hazard and adverse selection problems and restrict the access of small businesses to funds (Mukherjee and Bhattacharya, 2011).

3. Negative interest rates

A negative interest rate decreases the cost associated with a loan, thereby increasing demand, but such interest rate decreases and the amount of deposits, their owners are forced to "pay" to have a deposit in a bank.

In practice, the cost of ownership of cash seems to be much higher than the current cost of a deposit. A negative interest rate could redirect part of the savings to other financial operators, which also have a low yield in this economic climate. Just looking for a higher yield can be a source of inefficient allocation of resources.

In this context, commercial banks 'absorb' the negative or near 0% interest rates imposed by central banks, which diminishes their profit margin and this makes them more reluctant to lend.

The European Central Bank (ECB) has dropped the interest rate has steadily since the beginning of the global economic crisis, and since June 2014 it turned negative (– 0.1%). Some central banks have followed suit include the ECB in Denmark, Switzerland and Sweden. Just Fed seemed to give an impetus to increase the interest rate in December 2015, but no big central bank has followed the example.

Given the negative inflation rates, the real interest rate is still in positive territory, but is very low (between 0 and 1%). A negative interest rate can lead to a currency war and investors will shift toward other currencies, which will cause depreciation of domestic. This can lead to higher inflation, exports will increase and will boost the economy, but also prices of imports will increase and this strategy should be followed with caution when importing economies significantly more than it exports.

4. Central bank reaction function

Fisher's equation links the interest rate (it) inflation $(\pi t+1)$ and the real interest rate $(rt+1)$

$$i_t = \pi_{t+1} + r_{t+1}.$$

Depending on the doctrine addressed multiple scenarios are possible, some of which are described below.

- If the monetary policy interest rate increases, then the inflation rate increases.

From the chart below one can see the dependence between the two variables. Thus, a change in the interest rate monetary policy, the inflation would follow the same trajectory, with a slight delay. If the monetary policy interest rate would not vary, inflation would stabilize around the target (Fig. 2).

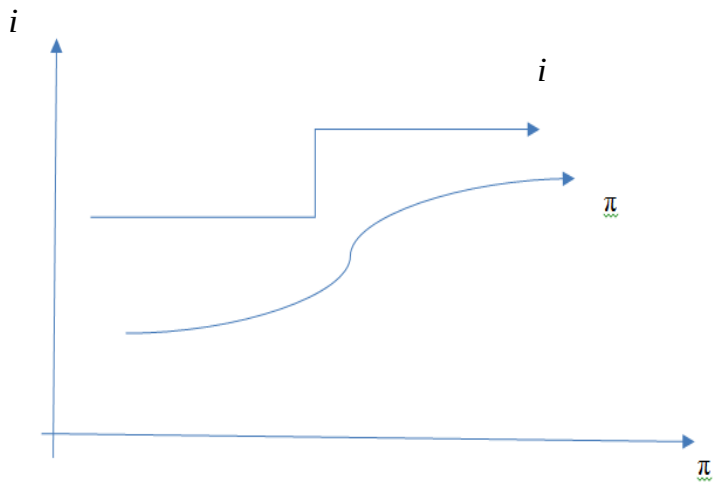

Figure 2. Variant of the relationship between *i* and π.

In the short term, inflation could fall, and if the central bank does not intervene, changes in the two variables could be described by the chart below.

The inflation rate shock evolution would be in response to interest rate change decision. If monetary policy makers would take the decision not to intervene on the interest rate (in the context of a relatively stable economic climate), the inflation rate would adjust and would return to the target. According Fisher's vision scenario described below, inflation would return to target value if a shock even if the monetary policy interest rate would not be changed (Fig. 3).

There could be an element of persistence in inflation rate to bring it to its value "natural". This scenario could be feasible if inflation expectations rational economic agents.

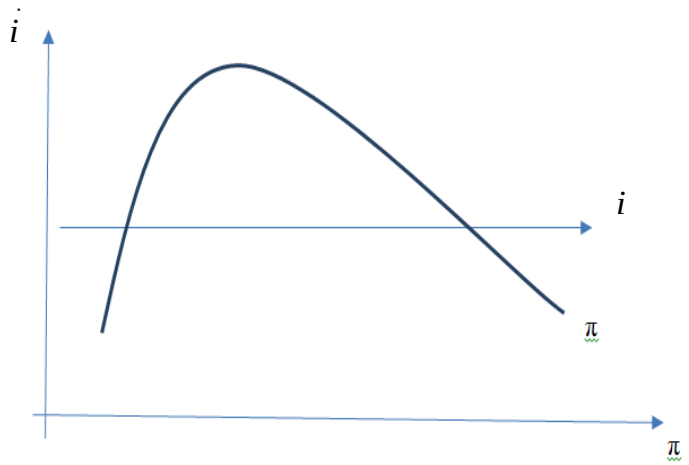

Figure 3. Variant of the relationship between *i* and π.

Previous assumptions contradict the Keynesian approach, which argues that if the central bank does not intervene and does not change the interest rate, then there is a risk of falling into a deflationary spiral: Thus, at an amendment to the monetary policy rate, the inflation rate will not react by adjusting in the desired direction and to maintain the same interest rate, inflation rate will not recover, continuing its evolution in negative territory (Fig. 4).

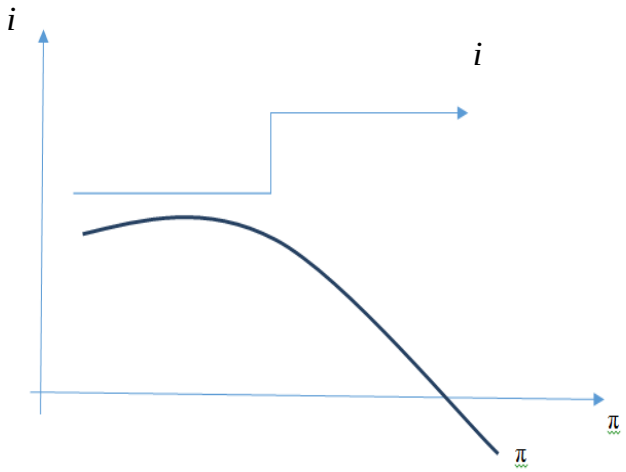

Figure 4. Variant of the relationship between *i* and π.

Inflation rate evolution into negative territory can be stopped by successive adjustments of the monetary policy rate. The cost associated with major changes and successive interest rate (the difference between the two variables) is quite high (Fig. 5).

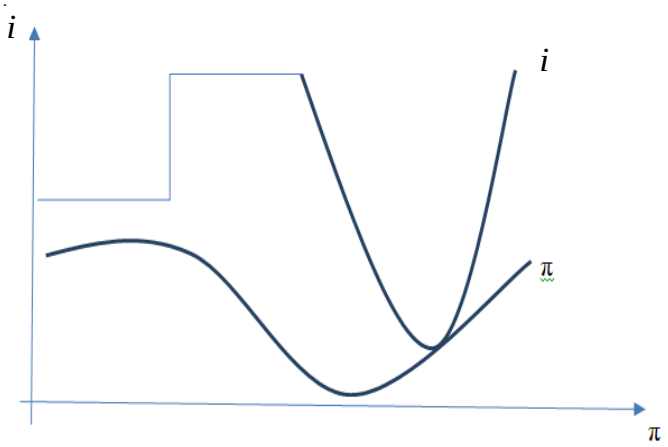

Figure 5. Variant of the relationship between *i* and π.

If policy-makers don't intervene and maintain the interest rate at a constant value, the inflation rate could have an upward trend. The duration and results of such a strategy are uncertain and depend in particular macro-economic conditions. However, according to Taylor's rule $i - i^* = \alpha(\pi - \pi^*)$, the central bank will intervene (Fig. 6):

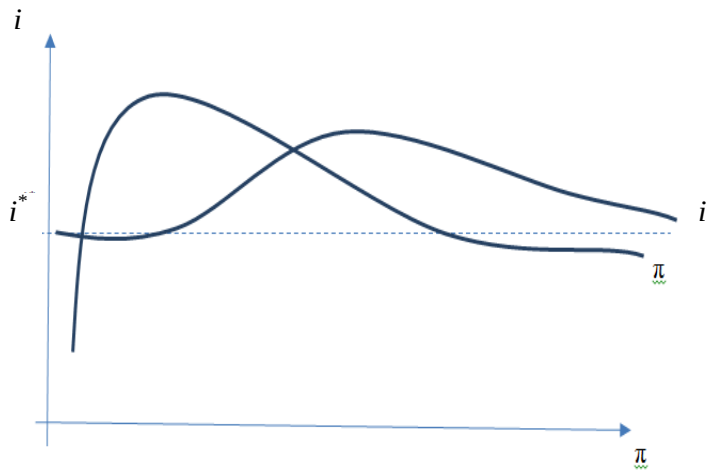

Figure 6. Variant of the relationship between *i* and π.

The scenarios presented above work within the limits described every doctrine, but the results are distorted when kept in sight adaptive inflationary expectations, especially in the context start quantitative easing programs; earlier this program by US monetarists were concerned about the emergence of hyperinflation.

The response of central banks differs depending on the strictness chosen monetary policy measures. In implementing the strategy of inflation targeting Svensson (1997a) presents two variants thereof:

- Strict inflation targeting: if there is a shock that causes an increase in inflation above target, the only objective that the central bank is concerned is to keep inflation close to target, then it should do so, which requires a strong policy with dramatic changes in the interest rate and exchange rate. Since the exchange rate channel has the lowest lag, this implies a strong exchange rate change to direct impact of exchange rate on import prices and, consequently, the consumer price index;
- Flexible inflation targeting: monetary policy aimed response is not so strong, the return of inflation to the target is gradual and inflation target in order to present a broader horizon. But too much flexibility could lead the public to doubt the bank 'commitment to target inflation, reducing the target's credibility, and hence the bank will not succeed in stabilizing inflationary expectations.

In the United Kingdom, in the pre-crisis period monetary policy rate decreased by small quotas, while inflation has remained below the required majority of the time with little variation (+/– 1pp below) until 2007 when interest rates began to decline and the inflation to rise amid the crisis.

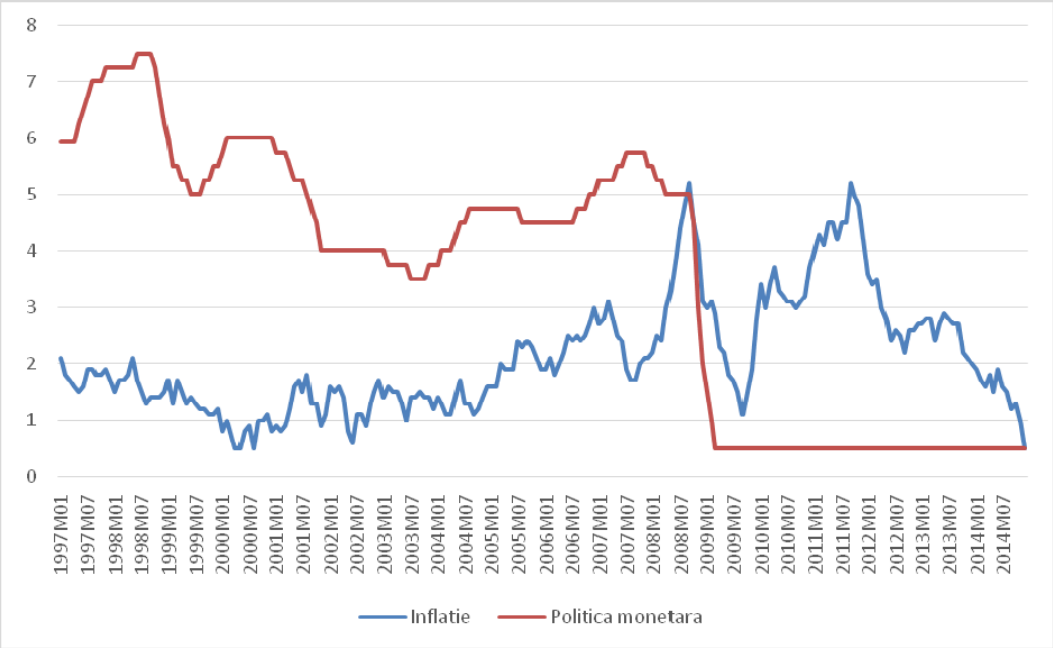

Figure 7. The evolution of monetary policy interest rates and inflation.

Source: Eurostat.

5. Estimate of the central's bank reaction function

With E-views Taylor's function was estimated using least squares. Within pursued, 1997-2014, the central bank reaction function look like this:

$$i = -1{,}022 * (\pi - \pi^*) + 0{,}126 * (y - y^*) + 3{,}708.$$

Coefficients are statistically significant (95%), and the model explains 29% of variation in the dependent variable.

The reasons for which the coefficients do not comply with the restrictions described above are the beginning of the program of quantitative easing in late 2008 and maintaining a low rate policy rate of 0.5% since March 2009.

The value of the interest rate was not reduced until the entry into the territory of negative values, regardless of the inflation rate. This is highlighted by the high value of the coefficient c (3) 3.7. Until the onset of

the crisis, in the period 1997-2008, the central bank's reaction function (Taylor) looks like this:

$$i - i^* = 0{,}15 * (\pi - \pi^*) + 0{,}18$$ [1]

Sample: 1997M01 2008M12						
Included observations: 144						
Autocorrelation	Partial Correlation		AC	PAC	Q-Stat	Prob
.|*** |	.|*** |	1	0.449	0.449	29.610	0.000
.|** |	.|. |	2	0.230	0.036	37.426	0.000
.|** |	.|* |	3	0.235	0.151	45.694	0.000
.|* |	.|. |	4	0.204	0.055	51.971	0.000
.|* |	*|. |	5	0.079	– 0.069	52.917	0.000
.|* |	.|* |	6	0.186	0.179	58.176	0.000
.|* |	.|. |	7	0.153	– 0.019	61.763	0.000
.|* |	.|. |	8	0.080	– 0.010	62.745	0.000
.|. |	*|. |	9	– 0.018	– 0.107	62.793	0.000
.|* |	.|* |	10	0.153	0.195	66.452	0.000
.|. |	*|. |	11	0.007	– 0.167	66.460	0.000
.|. |	.|. |	12	0.004	0.062	66.463	0.000
.|* |	.|* |	13	0.100	0.079	68.061	0.000
.|* |	.|. |	14	0.151	0.059	71.733	0.000
.|. |	.|. |	15	0.044	– 0.003	72.055	0.000
.|. |	*|. |	16	– 0.005	– 0.130	72.059	0.000
.|. |	.|. |	17	– 0.041	– 0.032	72.341	0.000
.|. |	.|. |	18	– 0.030	– 0.018	72.489	0.000
.|. |	.|. |	19	– 0.035	0.047	72.691	0.000
.|. |	*|. |	20	– 0.041	– 0.137	72.970	0.000
*|. |	.|. |	21	– 0.068	0.019	73.766	0.000
*|. |	.|. |	22	– 0.095	– 0.053	75.334	0.000
*|. |	.|. |	23	– 0.100	– 0.012	77.063	0.000
*|. |	.|. |	24	– 0.066	0.006	77.837	0.000
*|. |	.|. |	25	– 0.087	– 0.054	79.161	0.000
*|. |	.|. |	26	– 0.103	– 0.006	81.068	0.000
*|. |	.|. |	27	– 0.081	– 0.022	82.237	0.000
*|. |	.|. |	28	– 0.084	– 0.029	83.515	0.000
*|. |	.|. |	29	– 0.103	– 0.059	85.464	0.000
*|. |	.|. |	30	– 0.100	0.037	87.323	0.000
*|. |	.|. |	31	– 0.111	– 0.060	89.598	0.000

[1] The coefficients have a value of 95%, and the model explains 40% of the variation in the dependent variable ($i - i^*$). No autocorrelation of errors, with only the first autocorrelation lag.

*|. |	.|. |	32	– 0.124	– 0.027	92.477	0.000
*|. |	.|. |	33	– 0.101	– 0.001	94.426	0.000
.|. |	.|. |	34	– 0.051	0.034	94.916	0.000
.|. |	.|. |	35	– 0.032	0.054	95.109	0.000
.|. |	.|. |	36	– 0.032	0.009	95.314	0.000

Figure 8. Autocorrelation errors.

Source: Eurostat, own calculations.

During this period, the Monetary Policy Committee of the Bank of England did not intervene drastically on the amount of interest rate monetary policy to control inflation.

In 2009-2014, when the output gap was negative, being – 13.9% minimum with the opening program of quantitative easing and setting monetary policy rate at 0.5%, had the following reaction function form:

$$i = -0{,}00083 * (\pi - \pi^*) - 0{,}0090 * (y - y^*) - 0{,}5.$$

The coefficients are not significant in statistical terms, and the model does not explain the variation in the dependent variable *i*. This is explained by the constant value of 0.5% and a negative output gap of the country, being made by control inflation using asset purchase program.

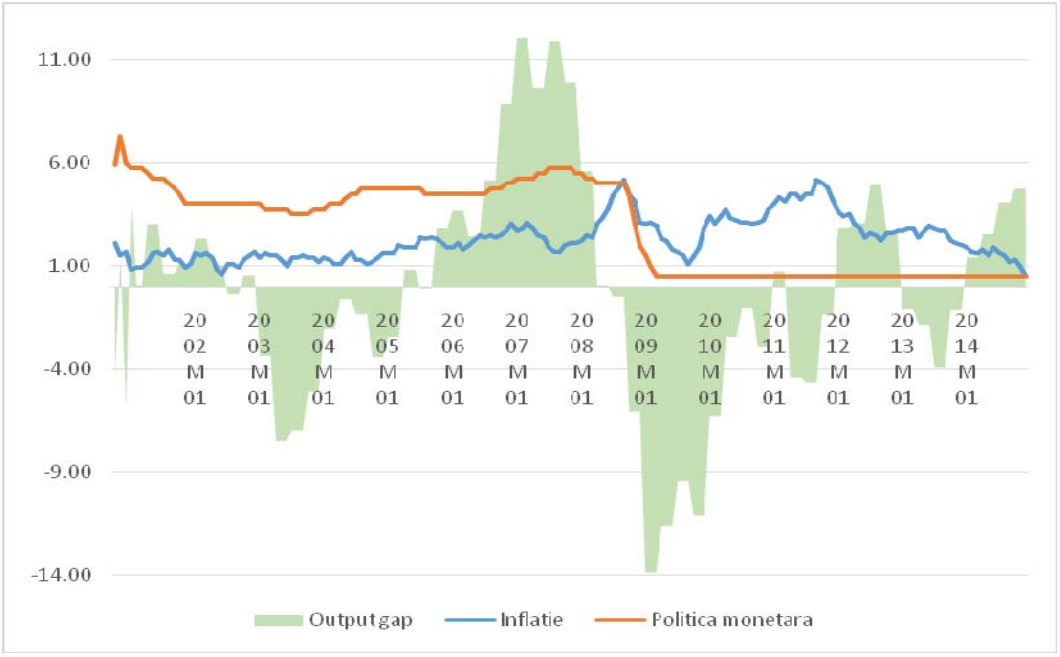

Figure 9. The evolution of the monetary policy interest rates, inflation and the output gap.

Source: Eurostat, own calculations.

The data represented in the chart above (Fig. 9) is observed inflation rate fluctuation independent monetary policy rate, which has remained constant. Output gap's fluctuations and inflation being caused by other factors, including and start quantitative easing program.

6. Conclusons

So far, the strategy of inflation targeting has proven its efficiency in operating the discretion allowing flexibility, which is necessary in the current economic environment dominated by instability and shocks.

The strategy of inflation targeting the Bank of England was effective in the period after independence in 1997 until the onset of the crisis in 2007. In the crisis and post-crisis downward rate no longer effective monetary policy, quantitative easing program started was economic context an appropriate choice to control price levels.

Maintaining QE program is an appropriate strategy in a context of very low inflation rate, reaching even turned negative in May 2015.

The real challenge will be to control inflation when stopping the program, coupled with the need for a monetary policy interest rate much higher than today (0.5%) for the control of inflation in the future.

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