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# Dynamic inconsistency and monetary policy management

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## Abstract

This paper studies the importance of the dynamic inconsistency of monetary policy. The paper is organized as follows: in the first part the concept of dynamic inconsistency is explained; the next sections analyse the the rules versus discretion dilemma and some solutions to counteract the dynamic inconsistency of monetary policy - delegate monetary policy to an independent and conservative central banker; offering to the central banker a performance contract, in which his salary is directly linked to the performance of some important macroeconomic variables such as GDP and inflation rate; inflation targeting strategy. The last section briefly presents the management of monetary policy in Romania after adoption of inflation targeting strategy.

**Keywords:** dynamic inconsistency, rules, discretion, monetary policy management, inflation targeting

## Introduction

Dynamic inconsistency arises because monetary policy makers choose to pursue short term goals leading to missing the long-term goals. Expansionary monetary policy will lead, in the short term, at a faster economic growth and reduce unemployment and those who choose the monetary policy coordinates will be tempted to adopt this path, although on the long-term positive results are offset by prices and salaries increases in the private sector, caused by a relaxed monetary policy. Thus, in the long-term inflation will increase, its negative effects altering the economic situation. McCallum (1995) shows that central banks are able to discern long-term negative effects of those temporary positive in short-term and avoid them, as long as they are independent. In most cases, dynamic inconsistency is caused by political pressures on monetary policy makers.

Dynamic inconsistency of monetary policy is ex-post deviation from the ex ante formulated plans, when these plans would have been implemented. Reasons stemming from the existence of dynamic inconsistency in monetary policy refers to: monetary authority wishes (or pressures from the government in this regard) to increase employment levels or, in a more general perspective, the level of economic activity (generally substantiated by the existence of distortions in the input market - for example, distortionary taxation of labor or the existence of transfer programs -

leading to suboptimal levels in terms of employment or economic activity itself), eroding the real value of public debt, if you generate inflationary surprises, inflationary consequences of devaluations undertaken to improve the current account situation (Cukierman, 1986).

An effective way to reduce the time-inconsistency problem is to give central banks the primary goal of maintaining price stability and ensuring the independence of the central bank to achieve the target without government interference. Such an institutional commitment to price stability can enhance the credibility of monetary policy and improve its performance.

### **Rules versus discretion in monetary policy**

Most economists, including Mishkin, characterize inflation targeting as a monetary policy framework that can be called "limited discretionism" which combines the advantages attributed to the traditional rules with discretionary policy. Thus, they reject the idea of a dichotomy rules - discretionary policy.

Another way to address the issue is to highlight differences between economic behaviors determined by applying rules or discretionary policies, assuming that no central bank does apply a simple formula or does describe an optimal control for monetary policy instruments. In 1993, Taylor showed that a rule-based behavior is systematically (in the methodically sense, following a plan and not by chance or by circumstance). McCallum does not consider the statement sufficient, because a central bank can act systematically (always answering the same type of problems with the same type of measures), remaining discretionary in the analytical sense.

The constrained discretionism notion - which leaves to central bank the freedom to dispose of instruments, but not that linked to goals that must be achieved - combines discretionary policy of central bank with monetary policy rules. Practically, central bank must choose that configuration of policy instruments which leads to maximize the likelihood of achieving the target, which gives monetary policy a strong proactive character.

The conclusion of most debates - whether monetary policy should be discretionary or should follow a rule - is that economic policies should be consistent in time to be credible to private agents.

Monetary policy credibility problem occurs when those who set the monetary policy wants to achieve an optimal monetary policy rule or a plan for future policy at a time  $t$ , chosen arbitrarily. Monetary authority will have to maximize a function under certain constraints derived from the need to ensure the balance of private sector. When they select the best policy for a time  $t+s$  in the future the policy maker must take account of how the policy for the period  $t+s$  will affect the behavior of private economic agents from time  $t$  to time  $t+s$ . When it comes to  $t+s$  arises the following problem: the trajectory of monetary policy determined at time  $t$  will be longer optimal? A policy is time consistent if the action planned at time  $t$  for time  $t+s$

remains optimal when it comes to be implemented effectively at time  $t+s$ . Usually, according to expert studies of monetary policy, it will no longer be optimal. Since consumer decisions taken between times  $t$  and  $t+s$  have been already adopted, monetary policy can no longer influence them. Monetary policy maker faces problems, others than those which were valid at time  $t$  and this will make him prefer a different policy. In this case original choice that he did will be dynamically inconsistent.

An optimal monetary policy strategy at time  $t$  is dynamically inconsistent if at time  $t+s$ , when should be adopted it is no longer optimal. In general, there must be some externalities and should not be a sufficient number of tools to control them (condition which usually occurs in most economies) for that dynamic inconsistency phenomenon to appear.

If monetary policy decision-maker is obliged to respect for the period  $t+s$  the conduct determined at time  $t$ , because cost of monetary policy change is too large, dynamic inconsistency problem becomes irrelevant.

In reality, monetary policy is conducted in a discretionary environment in which decisions are taken sequentially and review of the decisions taken by policy makers is a common practice. In this case, private agents will anticipate future incentive of monetary policy makers to abandon the plan proved to be optimal *ex ante* and would expect instead to be implemented an *ex post* optimal policy.

Kydland and Prescott (1977) show that, in a discretionary environment, in which policy makers will choose to follow the strategy taking into account only the present situation, this will not normally result in maximizing the social function.

Starting from the benefits it might produce unexpected inflation by increasing output and hence, reduce unemployment below the natural rate and also increase government revenue by nominal depreciation of government debt, which would have the same effect as levying a new tax income, Barro and Gordon (1983) show that a rule-based monetary policy leads to lower costs than a discretionary policy. In case of using monetary policy rules, the bank will choose the level of inflation which coincides with expected inflation.

As a result, leading to lower costs associated with inflation, the use of monetary policy rules lead to better results than discretionary policy, which coincides with conclusions reached by Kydland and Prescott.

The existence of inflation bias in case of discretionary policy occurs for two reasons: first is the fact that the central bank is stimulated to produce inflation more than the expected inflation when agents' expectations are set and the second reason is that the central bank can not commit to obtain a zero rate of inflation .

Explanation is that monetary policy maker can not be credible regarding the policy of zero rate of inflation. Thus, even if he announces that inflation rate will be zero and the decisions of private agents will be based on the assumption that inflation will actually be zero, is in his interest to induce a rise in price level. Gain from

increased output by fooling economic agents sufficiently offset the costs of higher inflation, which implies lack of credibility of the policy promoted without a firm commitment from the monetary policy maker. Therefore, the implemented policy is dynamically inconsistent.

The problem becomes seriously if the governors have short-term objectives and can influence central bank policy. Reality has shown that high degree of central banks independence make a commitment to low inflation to be more credible. However, independence is not sufficient because the policy maker may wish to obtain an output level above the potential level (sustainable, non-inflationary). Therefore, another prerequisite is the commitment of monetary policy to promote an increase in output similar to the potential.

### **Solutions to counteract the dynamic inconsistency of monetary policy**

A first category of proposed solutions to counter by motivational way the dynamic inconsistency of monetary policy and reducing the inflation bias, refers to the delegation of monetary policy formulation and implementation to a "conservative" central banker, defined as an inflation-averse individual, aversion higher than the social ones (Rogoff, 1985). This delegation does not eliminate the dynamic inconsistency problem, but reduces the inflation bias. An interesting question is how central bankers react to supply shocks. Rogoff argues that the existence of an excessive aversion to inflation is considered to be suboptimal in terms of maintaining the flexibility needed to stabilize real output. In addition, targets mainly play the role of mechanisms for monetary policy discipline, being rarely optimal achieving them accurately.

There appears a compromise: having a conservative central banker there are benefits due to a low inflation, but at a cost - distorted reaction to shocks. To large shocks on the supply side, the public would prefer a higher inflation than that obtained by the conservative central banker. Rogoff shows that, given this compromise, there is an optimal degree of central bank conservatism.

Some economists (Walsh, 1995, Persson and Tabellini, 1993) have proposed another solution to the problem of dynamic inconsistency: this consist in offering the central banker a performance contract, in which his salary is directly linked to the performance of some important macroeconomic variables such as GDP and inflation rate. Thus, Walsh (1995) suggests that, rather than worry about the search for a conservative central banker, the society should stimulate monetary authority through a performance contract, so when it pursues its own interests, simultaneously maximizes the welfare of the society.

The advantage of such a contract is that its implementation is independent of informational asymmetry (private information available to the central bank becomes irrelevant) and also of the effort made by policy makers to implement monetary policy, monitoring performance in relation to contractual obligations (ie the inflation

target) being made only in relation to monetary variables publicly observable (Popa, 2000).

Another important advantage of the penalty formulation dependent of changes in inflation rate is the central bank's motivation in setting realistic targets, taking into account both the correlation of the cost attached to failure to achieve the target with the size of ex-post deviation from it and that benefit of generating unanticipated inflation drops to higher rates of targeted inflation. Thus, the monetary authority behavior in relation to economic agents should be seen rather as a principal – agent problem. The agent (monetary authority) has, however, a set of preferences that do not yield the outcome preferred by the society (principal). In this case, there is at least one disadvantage: the contract is signed by the central bank and private agents, but in reality such a contract can only be conceivable between a political body and the central bank. The question that remains is what political body should bear responsibility for signing the contract. If government should be the principal, we have principal-agent problem of second order, because the government is, from this point of view an agent of the public (the contracts with our governments don't perform well).

McCallum (1995) argues that if government is the principal, then the performance contract approach does not solve the dynamic inconsistency. If the contract is put into effect, then the government must sanction the central bank in periods of high inflation, but has an incentive not to do it - because imposing a sanction on the central bank, when inflation is already high, will not reduce the dynamic inconsistency, will not increase the social welfare, having only a preventive role.

One solution to avoid the problem of dynamic inconsistency and the most common is the inflation targeting strategy, because monetary authorities are forced to maintain unchanged behavior, individuals being able to observe at any time if the central bank can not achieve the inflation target, or if there is a tendency of failing measures initially adopted.

Another advantage of this strategy is that inflation targeting allows monetary policy respond to domestic shocks in the economy, because the monetary authority does not depend on one variable that can not control, but can use all available information to develop and use appropriate measures to combat shocks occurring in the national economy, unlike other solutions and strategies (conservative central banker, exchange rate or monetary aggregate targeting).

Although inflation targeting is not a rigid rule, because the central bank can use all available information to determine the optimal policy and must not focus on one variable, however, changing inflation targets can create order reputational damage, which decreases the credibility of monetary authorities, in the future resulting in failure to combat inflation. Thus, inflation targeting combines the advantages conferred by the rules with those of discretionary policy, this monetary policy regime combining the constraint imposed by the target with a margin of flexibility in the instruments used by the monetary authority.

### The management of monetary policy in Romania

Pursuant to its statute, the primary objective of the National Bank of Romania is to ensure and maintain price stability. Since August 2005, monetary policy is implemented in the context of inflation targeting strategy, which coexist with the exchange rate regime of the leu (a managed float). This exchange rate regime is consistent with the use of inflation targets as a nominal anchor of monetary policy and allows a flexible response of this policy to unexpected shocks that may affect the economy.

During 2005-September 2008 the main instrument of monetary policy was attracting deposits, the fixed interest rate attached to these investments being the monetary policy rate. NBR has made successive changes in the characteristics of this instrument, thus aiming to increase the management effectiveness by the central bank of money market liquidity conditions and hence the influence of monetary policy instruments on short-term interest rates in this market. A major change produced in the operational framework of monetary policy occurred in the last quarter of 2008, given the further reducing of the structural excess liquidity, net liquidity of banks has become negative. In these circumstances, for the first time in the past decade, NBR returned to the position of the banking system creditor.

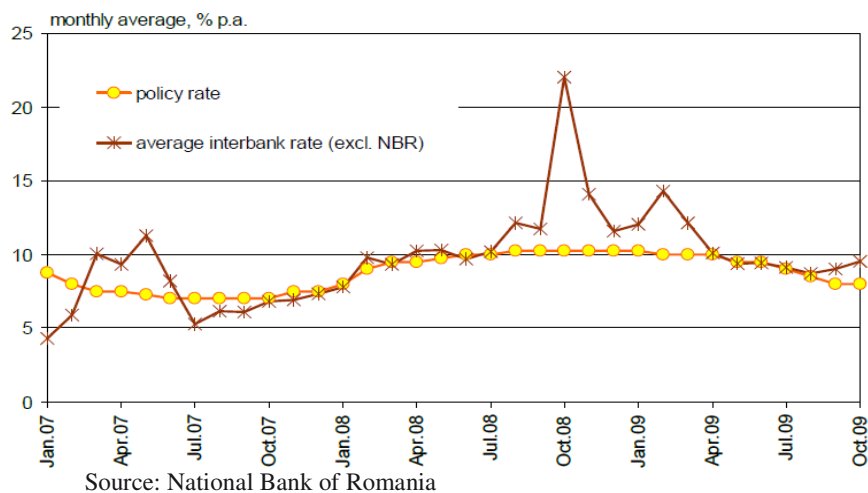


Fig 1. Widening Spread between Interbank Rates and Policy Rate

During 2005-2007 there were periods when inflation expectations coexisted with a markedly stronger domestic currency. Under the circumstances, the central bank was faced with a serious dilemma in terms of the newly-adopted monetary policy regime. Policy rate hikes, required for bringing expectations in line with the inflation target, attracted further foreign capital, which entailed the appreciation of the leu.

The constraint deriving from the large capital inflows was severe enough for the NBR to opt for maintaining a managed float regime of the domestic currency. This led to criticism by some analysts who claimed that the inflation targeting strategy

adopted in 2005 involved the free float of the domestic currency in order to avoid potentially conflicting targets.

The central bank's policy on forex market intervention was further steered in this new environment by the philosophy that a high volatility of the exchange rate is detrimental to the inflation target as well as to the financial soundness of the real and financial sectors. A small emerging economy with a significant openness is exposed on an ongoing basis to the threat of capital movements likely to adversely affect the stability of the financial market, the foreign exchange market in particular.

The NBR's interventions in the foreign exchange market were meant to avoid an excessive weakening of the domestic currency, while also linking the level and the pace of the depreciation to the progress in the current account adjustment. With this goal in mind, the central bank monitored the developments in the real effective exchange rate of the domestic currency, along with the pressures on external competitiveness stemming from wage bargaining.

The magnitude and the timing of forex market interventions were also related to money market liquidity management, given that public deficit was financed, over certain periods, by resorting chiefly to the funds released under the arrangement signed with the EU, the IMF and other international financial institutions. The NBR provided banks with liquidity by way of open-market operations, while in the prior years, amid excess liquidity due to massive capital inflows, the central bank held the position of a net debtor position vis-à-vis the banking system. The rationale behind the forex market intervention in the above-mentioned context was the attempt to fend off temporary reversals in the NBR's creditor position vis-à-vis the banking system, which could have jeopardised the monetary policy transmission mechanism.

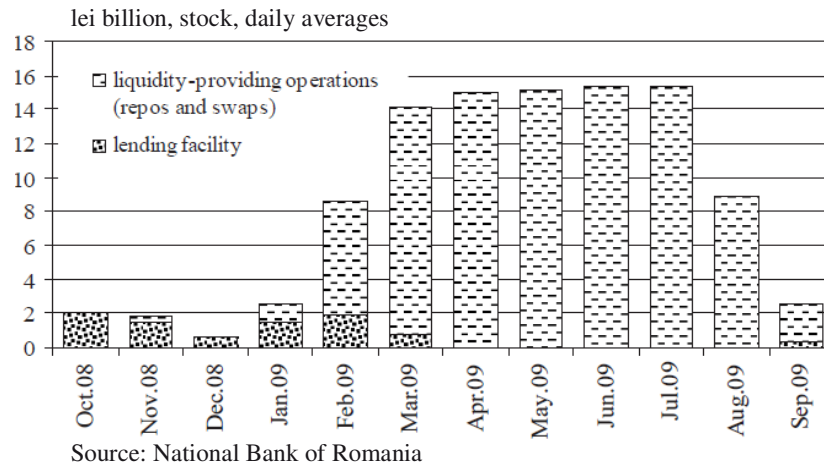
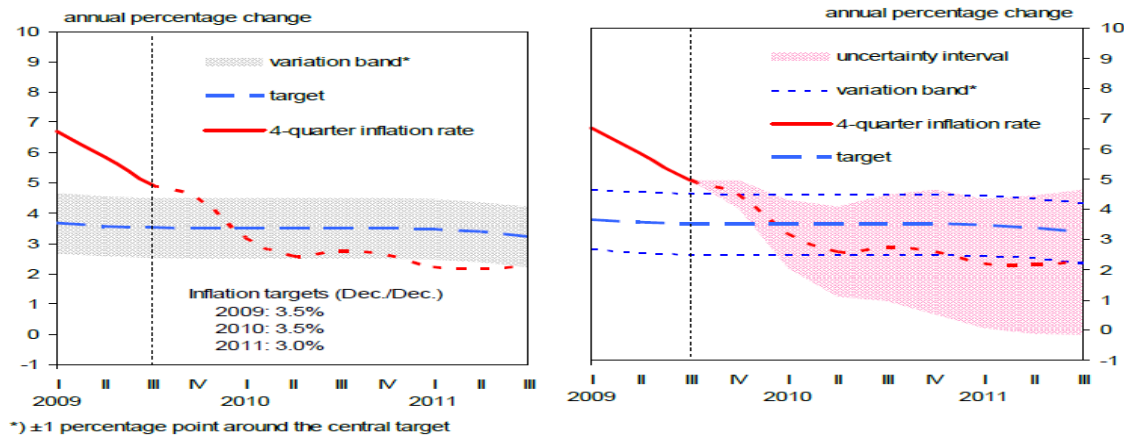


Fig 2. Liquidity-providing operations

Therefore, it may be asserted that foreign exchange market interventions proved useful not only in keeping the exchange rate within a range consistent with macroeconomic fundamentals, but also in ensuring optimal money market liquidity management.



Annual inflation targets (are determined by the central bank with the government on a time horizon of two years) were placed in recent years on a downward path, their levels falling from 7.5 percent  $\pm$  1 percentage point in 2005 to 3.5 percent  $\pm$  1 percentage point in 2009 and 2010. Inflation target for the end of 2011 was lowered to the level of 3 percent  $\pm$  1 percentage point.



Source: National Bank of Romania

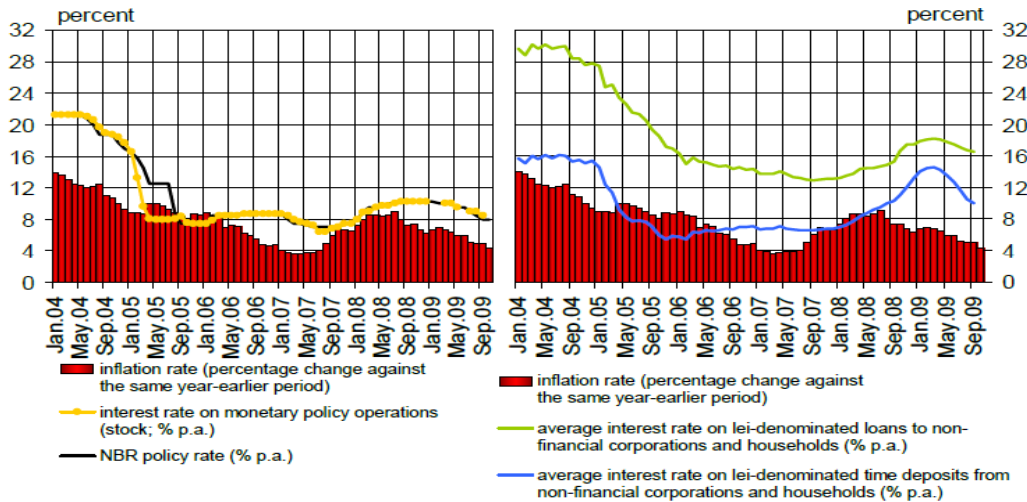
Fig 3. Inflation Forecast

The option to increase for 2011 the downward trend of annual inflation targets was justified mainly by the perspective of a sustained deceleration of inflation in coming years, considering the severe contraction suffered by the Romanian economy in 2009 under the impact of the global financial and economic crisis and the slow recovery, anticipated in the post-crisis period, of global and national economy. At the same time, the option regarding the inflation target for 2011 reflected the central bank's concern to establish realistic goals, achieving them being essential for strengthening the central bank credibility and anchoring inflation expectations over the medium term.

Strengthening disinflation in the rhythm imposed by achieving annual inflation targets remains a challenge for monetary policy. In 2009, one of the challenges resulted from the need to ensure an orderly adjustment of severe macroeconomic imbalances previously accumulated and also the imperative of maintaining financial stability, in the context of global financial and economic crisis.

Central bank opted for a gradual adjustment of real monetary conditions broadly, intended to maintain the cautious nature of monetary policy. Thus, the reduction from 10.25 percent to 8 percent of interest rate monetary policy operated by the central bank during 2009 (within February-September) was done in five steps. By its

decisions, the monetary authority has sought to ensure convergence of inflation to the medium-term objectives and creating the conditions for sustainable revitalization of the loan process of the Romanian economy; reducing the required reserve ratios also joined the gradual alignment process of their level to the ECB standards.



Source: National Bank of Romania

Fig 4. Inflation Rate and Interest Rates

The stabilization of the domestic political environment and reactivation of multilateral external financing arrangement signed with the EU, IMF and other international financial institutions, likely to reduce the risks related to the economic policy mix implemented by the authorities and thus to improve the perception of external environment on the Romanian economy, allowed central bank to reduce monetary policy rate. Thus, within January-March 2010, the central bank made three successive reductions of the monetary policy rate - by 0.50 percentage points each - being lowered at the level of 6.5 percent.

Inflation targeting in Romania was less orthodox, soft type, for several reasons: monetary duality of the economy - with large euroisation, high interest differential, premature liberalization of capital account and under conditions of imperfect markets (of a monetary transmission mechanism immature), NBR was unable to disregard the exchange rate dynamics. Interest rates were sometimes very low in the money market with the desire to discourage speculative capital, while the central goal was to get disinflation, so to not leave excess liquidity in the market. We have a relatively small economy at the scale of Europe and excessive currency fluctuations may not only cause financial instability. In terms of the dilemmas that may have a central bank, we had to reconcile disinflation with the need to discourage speculative high capital inputs, markets imperfections allowing a central bank practice "less clean". We practice inflation targeting in a hybrid formula which

allows some flexibility in the conduct of monetary policy (Dăianu, 2008). This is strengthened by a previous study (Balaban and Vîntu, 2010) in which we estimated the Phillips curve for Romania. The results of econometric tests indicate a significant estimated coefficient of the output gap for Romania, which support the assumption of a nonlinear Phillips curve. This suggests that the National Bank of Romania's monetary policy strategy should aim a flexible inflation targeting.

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