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Measuring the efficiency of Algerian central bank against inflation

MAHDAOUI Meryem[1] , BOUCHRA Abdelghani[2]

[1] University of AHMED DRAIA Adrar (Algeria),
[2] University of AHMED DRAIA Adrar (Algeria),

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Abstract:

This article attempts to assess the effectiveness of targeting inflation policy to reduce inflation in Algeria during the period 1990-2020, using annual data.

In our research, inflation is represented by the change in the money supply (M) and the gross domestic product (GDP).

The obtained results showed the weak effect of monetary policy in influencing inflation rates is due to the lack of complete independence of the Central Bank of Algeria in taking the correct decisions and measures to reduce inflation Rates.

Keywords: *the effectiveness, inflation, targeting inflation policy, the money supply, the gross domestic product*

Jel Classification Codes : *E58; P24*

Corresponding Author: *MAHDAOUI Meryem, Mer.mahdaoui@univ-adrar.edu.dz*

1. Introduction :

After choosing to turn to the market economy, Algeria was forced to launch a process of modernization of its banking sector and try to catch up with the delay in economic adaptation taken on its neighbors.

Moving to the market system requires a banking system with fundamentals and monetary policy contributing to the lifting of economic efficiency and stability.

Monetary policy is composed of total economic policy components; in general, the final goals of monetary policy revolve on the goal of the head to achieve the price stability, which is the most important pillars of stability economic, and the way to achieve this is the pursuit of monetary authorities (represented in banks Central) to investigate a range of intermediates to be achieved Its final goals are through the use of different monetary policy tools.

Because inflation conditions are characterized by the high level of prices and the direction of agricultural To lack its real value and thus increase expenditures in general to the increase as they are added For domestic product, and imposing a full recruitment in the local economy, the use of Activate both monetary policy tools and financial policy not only to go out At the full level of operational and eliminate the crisis, but also achieve an economic balance Gap between GDP and national spending

It should be noted that inflation is a problem and an economic dilemma affecting economics Developed and developing countries, and inflation on national economies are increasing The greater the appropriate environment for inflationary pressures in the economy Feeding pressures contribute to which variables of factors from a group on their impact Pulse and pay local price levels towards the rise and the economies of States are considered Developing among economies with appropriate environment for inflationary pressures, and what helped The fragility of its economic, political, social and cultural systems

Algeria as a sample of developing countries has adopted an inflation targeting policy as a new monetary policy framework to become of great importance to quantity and banking targets, which can be interpreted as intermediate indicators or operational objectives. The average target inflation requires the tools to deepen the analytical framework to support and implement the monetary policy formulation and implementation of a flexible manner by the Central Bank.

- **Pose the problem:**

Based on the above, our search can be formulated in the following main question:

How effective monetary policy is to target inflation in Algeria?

To answer this main question, the following sub-questions are placed

- What is the most important reforms that are brought to the Algerian banking system?
- What is inflation?
- What is the policy of targeting inflation?
- How can this policy be measured in Algeria?

To answer the previous questions and based on previous studies conducted at the international level for the policy of inflation targeting, among which we mention:

The experience of the Central Bank of Egypt in changing the monetary policy followed and moving to the implementation of the inflation targeting strategy since 2003 by providing the basic requirements for this by adopting the interest rate framework system that includes two rates, one for deposit and the other for borrowing, in addition to using open market operations to manage liquidity.(البنك المركزي المصري، 2019)

The Central Bank of Tunisia has adopted the target inflation policy as a framework for managing monetary policy, focusing on price stability as a main objective for the Central Bank of Tunisia, so that the policy timeframe continues (May 2011-May 2013) within the framework of cooperation between the Central Bank of Tunisia and the French Central Bank. (Arab Monetary Fund, 2017)

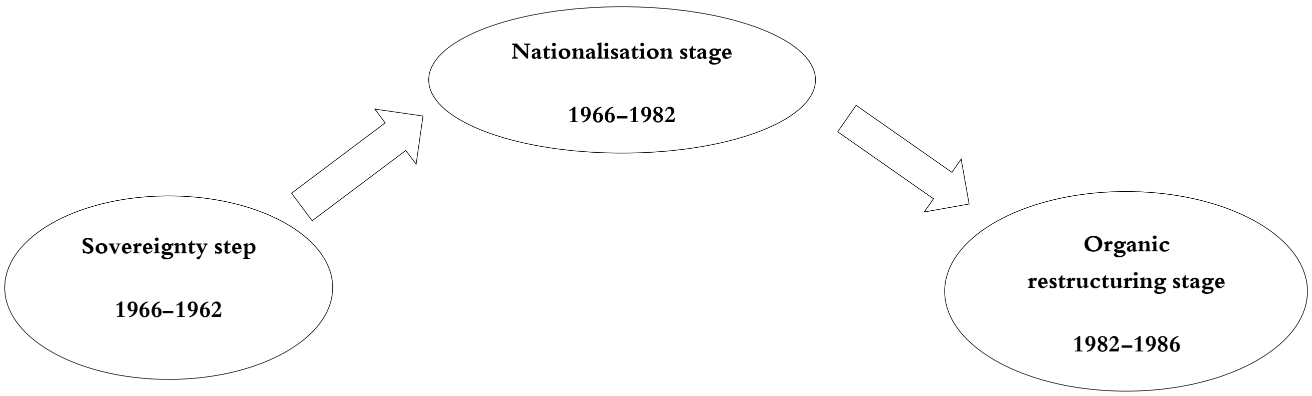
The Indonesian economy witnessed low and relatively stable rates of inflation after the Central Bank adopted a policy of inflation targeting in July 2005 with its eagerness to gain the confidence of market dealers from the private sector and individuals. However, the challenges faced by the Central Bank in this regard after the global financial crisis were subject to extensive discussions On the part of monetary policy makers in order to achieve economic stability. (Indonesia central Bank, 2006)

The Central Bank of Brazil adopted the policy of inflation targeting in 1999, aiming to achieve an inflation rate of one percent within three years. Of the macroeconomic models related to monetary policy, taking into account a number of variables such as the output gap, the real interest rate, demand shocks, privatization of public companies, and trade liberalization. The Central Bank aimed to achieve an inflation rate of 4.5 percent, with an allowable margin of two percent, up and down. (Banco Central Do Brazil,)

2. Evolution and reforms of the Algerian banking system:

After independence, Algeria experienced developments and changes in the economic field, especially the banking sector that is the main engine of national economic activity, and it pushes the wheel of growth towards progress. This sector witnessed several reforms aimed at improving it and in line with the country’s economic, social and political goals until the last reform in 1990 with the issuance of the Monetary and Loan Law, which the Central Bank of Algeria was the first to benefit from, as it granted it This law is independent, so it aims mainly after restoring its true position to maintain the stability of the value of the national currency and to maintain price stability; The monetary bloc also witnessed a remarkable development from its components and interviews. According to the position and role of each of them.

Diagram01: the stages of the Algerian banking system revolution



Source: by the researchers

- **Sovereignty step (1962-1966):**

Considering that the Central Bank is a symbol of sovereignty, Algeria took the initiative to establish the Central Bank of Algeria in 13/12/1962; for the national development process that requires large capital to finance investments, the Algerian Fund for Development was established in 1963 Which later turned into the Algerian Bank for Development; Establishment of the National Fund for Savings and Reserves.

Within the framework of the socialist approach adopted by Algeria at the time, the process of nationalization was initiated, as the banking institutions that existed were nationalized during 1966 and 1967.

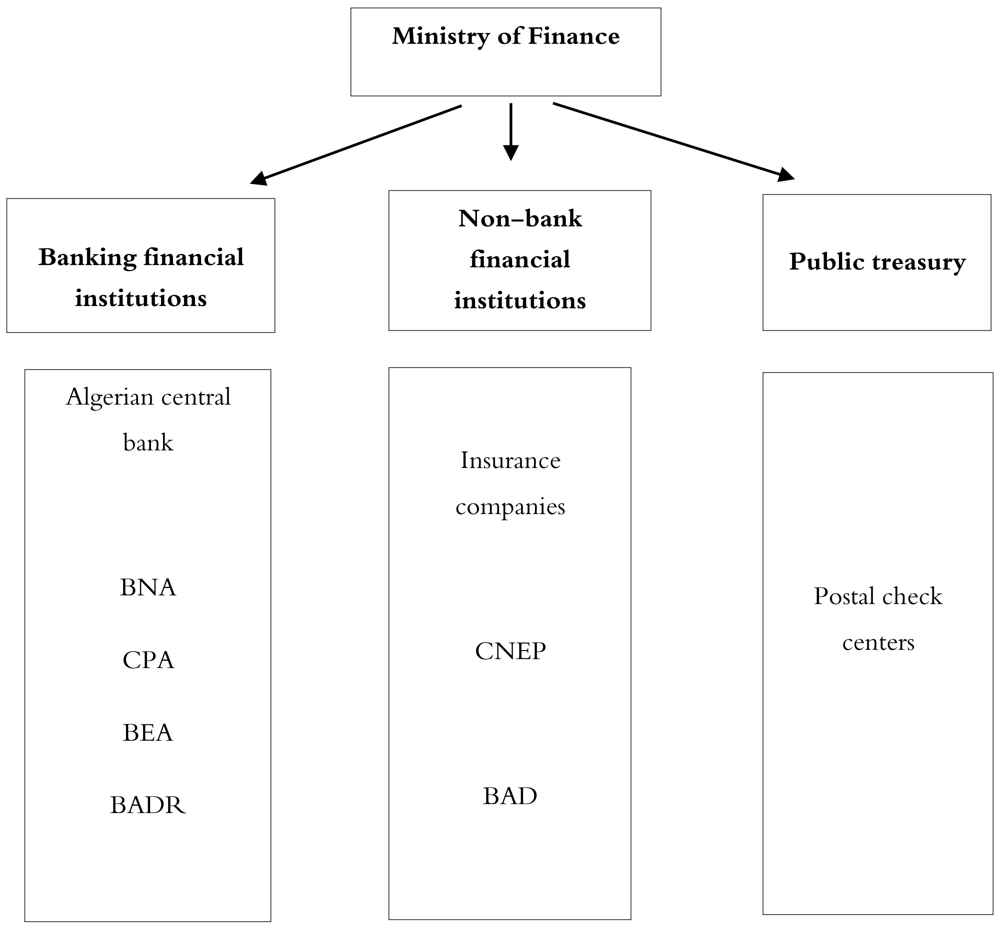
- **Nationalisation stage (1966-1982):**

The reform during this period focused on:

✓ Deprivation of banking;
✓ Centralization;
✓ The dominance of the public treasury.

- **Organic restructuring stage (1982-1986):**

Diagram01: Regulating the banking and financial system prior to the Banking Act of 1986



Source: by the researchers

The change in monetary policy has important effects on aggregate demand and therefore on production and prices. There are a number of ways in which political actions are transmitted to the real economy.

3. The concept of inflation:

3.1. Definition of inflation:

Inflation is one of the largest common economic terms, but despite the common use of this term, there is no agreement among economists on its definition, due to the division of opinion on the identification of inflation. Where this convention is used to describe a number of different situations, we can choose the following cases:

- Excessive height at the general level of prices
- High cash access or component of cash income such as wages or profits
- High costs.
- Over-creation of cash stocks.

The terms of inflation to the phenomenon, which is called a group of terms and include:

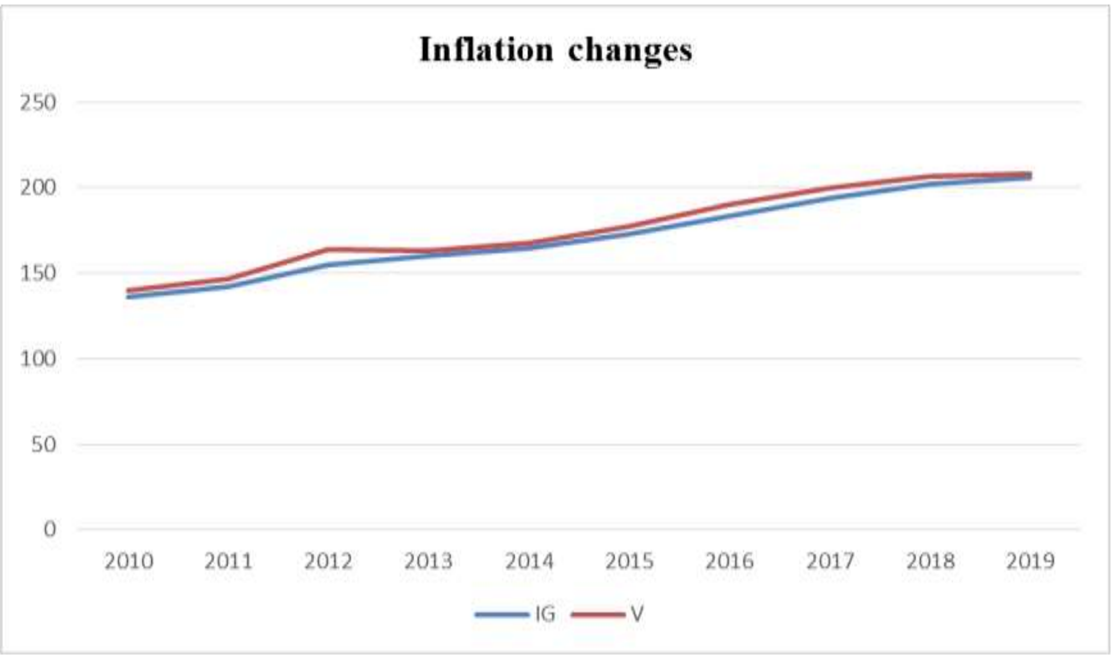
- Inflammation of prices: no excessive rise in prices
- Inflammation of income: Any cash login such as wage enlargement and swaps
- Cost inflation: any high costs.
- Cash inflation: Any over-creation of cash stocks. (حدادي ، 2017، صفحة 90)

In the following table, we will represent statistics on the general consumer index and its variations during the years 2010-2019 which can be considered as a tool to measure the inflation rate in Algeria:

Table1: situation data the General consumer index and its Variation

Years	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
General index	136.23	142.39	155.05	160.10	164.77	172.65	183.70	193.97	202.25	206.20
Variation (%)	3.91	4.52	8.89	3.25	2.92	4.78	6.40	5.59	4.27	1.95

Source: site of Algerian bank central



Source: by the researchers

The deceleration represented in the table and the diagram below affects several goods and services, in particular food and non-alcoholic beverages, the personal hygiene health group and that of transport and communication.

3.2. Inflation effects:

Inflation has economic and social effects affecting the process of economic development, and the most prominent of these effects are:

3.2.1. The economic effects of inflation:

- High prices and the amount of money in circulation ;
- Inflation causes the redistribution of income among the classes of society;
- Random redistribution of national wealth.

3.2.2. The social effects of inflation:

The first manifestation of inflation is the rise in prices of goods and services in an ever-increasing manner.

The rise in prices (inflation) will negatively affect the purchasing power of people with fixed incomes, including government employees and retirees

Increased unemployment

3.3. Inflation manifestations:

- Continuous general rise in the price level (decreased purchasing power);
- Gold price hike in local currency;
- Increase in foreign exchange rates against the local currency;
- Real asset price increases (such as land, buildings).

3.4. Anti-inflation methods:

The most important means of combating inflation are:

✓ *Monetary policy and its role in reducing inflation:*

Through its various direct and indirect tools

✓ *Financial policy tools:*

The most important tools of fiscal policy to combat inflation are:

- Tax control
- Overhead policy

3.5. Measuring inflation:

Measuring inflation is a highly technical issue that only rarely captures the public's, or even economists', attention. At the same time, it involves many choices that could have significant consequences for policies and outcomes.

4. Targeting inflation:

Inflation targeting policy is defined by **TUTER Easer** as "a monetary policy system characterized by a public declaration of the official goal of a quantitative (numerical) target for the inflation rate for one or more time periods, with the apparent recognition that the reduction and stability of inflation in the long run is the primary objective of monetary policy". (جليط و لحام، 2020، صفحة 38)

According to **Zied Ftiti**, based on the experiences of several countries, he considers that the inflation targeting system is characterized by the presence of two characteristics: an explicit numerical inflation target for which the indicator is determined, the target level and the permissible range, and the absence of an explicit middle target similar to targeting a monetary aggregate or targeting the exchange rate. (جليط& لحام, 2020, p. 39)

A general definition of inflation targeting policy can be given as follows: Targeting policy Inflation is a monetary policy framework within which the central bank can ensure a reduction in inflation inflation rates. Targeting is to determine the rate or range of inflation that operates monetary authorities to achieve within the predetermined period and this procedure allows declaration early inflation forecasts as well as charting measures to control prices.

Whereas, when designing an inflation targeting strategy, policy makers face a set of challenges, the most important of which are:

- Determining the appropriate time period to achieve the objectives.
- The mechanism for moving from higher paths to lower paths of inflation.
- Setting inflationary goals in the medium term.
- How to control exchange rate fluctuations while implementing an inflation targeting strategy. (عبد المنعم, هبه; طلحه, الوليد; صندوق النقد العربي، 2020، صفحة 06)

The Algerian central Bank has three main intervention policies:

- The bank refinancing policy:

It is based on the level of interest rates that the authorities vary according to the desired target;

- The reserve requirement policy:

It consists in forcing banks (by the central bank) to deposit part of their currency assets at the central bank without counterpart, which reduces the banks' liquidity position and hence the credits granted;

- Credit supervision policy:

It aims to cap the volume of credits granted by commercial banks to the economy, which will lead to a decline in the money supply.

It is for this reason that central banks resort to this policy in a situation of inflation requiring rapid and effective action. (BENZIANE & CHEKEBKEB, 2016,p 4)

5. The data:

The data comes mainly from the Bank of Algeria and the global development indicators, we used annual data covering the period from 1990 to 2020.

Inflation is represented by the change in the money supply (M) and the gross domestic product (GDP).

The following table includes the statistics of the gross national product and the money supply presented by the Central Bank of Algeria:

Table1: situation data the money supply (M) and the gross domestic product (GDP)

Année	M (money supply)	Y (GDP)
1990	343005	0.80000058
1991	415270	-1.20000059
1992	515902	1.8000023
1993	627427	-2.10000076
1994	723514	-0.89999655
1995	799562	3.79999479
1996	915058	4.09999847

1997	1081518	1.09999994
1998	1592461	5.10000361
1999	1789350	3.20000155
2000	2022534	3.8
2001	2473516	3
2002	2901532	5.6
2003	3354422	7.2
2004	3738037	4.3
2005	4157585	5.9
2006	4933744	1.7
2007	5994608	3.4
2008	6955968	2.4
2009	7173052	1.6
2010	8280740	3.6
2011	9929188	2.9
2012	11015.1	3.4
2013	11941.5	2.8
2014	13686.8	3.8
2015	13704.5	3.7
2016	13816.3	3.2
2017	14974.6	1.3
2018	16636.7	1.1
2019	151303.7	1
2020	154436.2	-5.1

Source: site of Algerian bank central

6. Econometric study:

Through what has been quoted above, we will try to build a model retracing the evolution or deflation of the inflationary gap depending on the variation of the money supply (M) and the gross domestic product (GDP).

The model on which our study is based, represented by the following equation:

$$F = \Delta M - (M/Y) * Y \Delta$$

Knowing that:

F: represent the inflationary gap;
M: represent the money supply;
Y: represent the gross domestic product (GDP).

By estimating the model above on the previous data during the period 1990 to 2020, on

année	M	V M	Y	V Y	M/Y	multiple	F
1990	343005	34859	0.80000058	-3.60000158	428755.939	-1543522.06	1578381.06
1991	415270	72265	-1.20000059	-2.00000117	-346058.164	692116.732	-619851.732
1992	515902	100632	1.8000023	3.00000289	286611.855	859836.394	-759204.394
1993	627427	111525	-2.10000076	-3.90000306	-298774.654	1165222.07	-1053697.07
1994	723514	96087	-0.89999655	1.20000421	-803907.524	-964692.409	1060779.41
1995	799562	76048	3.79999479	4.69999134	210411.341	988931.482	-912883.482
1996	915058	115496	4.09999847	0.30000368	223184.961	66956.3097	48539.6903
1997	1081518	166460	1.09999994	-2.99999853	983198.236	-2949593.26	3116053.26
1998	1592461	510943	5.10000361	4.00000367	312247.034	1248989.28	-738046.282
1999	1789350	196889	3.20000155	-1.90000206	559171.604	-1062427.2	1259316.2
2000	2022534	233184	3.8	0.59999845	532245.789	319346.648	-86162.6477
2001	2473516	450982	3	-0.8	824505.333	-659604.267	1110586.27
2002	2901532	428016	5.6	2.6	518130.714	1347139.86	-919123.857
2003	3354422	452890	7.2	1.6	465891.944	745427.111	-292537.111
2004	3738037	383615	4.3	-2.9	869310.93	-2521001.7	2904616.7
2005	4157585	419548	5.9	1.6	704675.424	1127480.68	-707932.678
2006	4933744	776159	1.7	-4.2	2902202.35	-12189249.9	12965408.9
2007	5994608	1060864	3.4	1.7	1763120	2997304	-1936440
2008	6955968	961360	2.4	-1	2898320	-2898320	3859680
2009	7173052	217084	1.6	-0.8	4483157.5	-3586526	3803610
2010	8280740	1107688	3.6	2	2300205.56	4600411.11	-3492723.11
2011	9929188	1648448	2.9	-0.7	3423857.93	-2396700.55	4045148.55
2012	11015.1	-9918172.9	3.4	0.5	3239.73529	1619.86765	-9919792.77
2013	11941.5	926.4	2.8	-0.6	4264.82143	-2558.89286	3485.29286
2014	13686.8	1745.3	3.8	1	3601.78947	3601.78947	-1856.48947
2015	13704.5	17.7	3.7	-0.1	3703.91892	-370.391892	388.091892
2016	13816.3	111.8	3.2	-0.5	4317.59375	-2158.79688	2270.59688
2017	14974.6	1158.3	1.3	-1.9	11518.9231	-21885.9538	23044.2538
2018	16636.7	1662.1	1.1	-0.2	15124.2727	-3024.85455	4686.95455
2019	151303.7	134667	1	-0.1	151303.7	-15130.37	149797.37
2020	154436.2	3132.5	-5.1	-6.1	-30281.6078	184717.808	-181585.308

STATA program we obtained the following results:

Output from the STATA program

7. Results discussion:

Through the results presented in the previous table, we find:

- Variation in the size of the inflationary gap as a result of the fluctuation in the size of the money supply offered by the Central Bank of Algeria;
- Instability of the level of variables used in the study;
- Weakness of co-integration between the size of the monetary supply **M** and the gross domestic product **Y**;
- The emergence of attempts to succeed in the inflation targeting policy adopted by the Central Bank of Algeria, through the discrepancy in the values of the inflationary gap between the negative, which represents the adoption of a deflationary policy and the positive, which expresses the excessive increase in the size of the money supply and thus the increase in the inflation rate during the study period.

8. Conclusion:

The main objective of monetary policy since the early 1990s has been price stability, by achieving a low level of inflation. To this end, the monetary authorities have used various instruments, such as liquidity recovery, credit control, reserve requirements, interest rates and the exchange rate. However, we can only speak of the conduct of monetary policy from 1994. It was in this year that the instruments and mechanisms began to take place.

During the previous study, we discussed general concepts about the policy of inflation targeting, which is considered as a modern framework for monetary policy. We also evaluated the effectiveness of this policy in targeting inflation rates in Algeria based on a measurement model for the inflationary gap based on the two variables of money supply in the broad concept as an indicator of monetary policy and GDP. During the period 1990-2020.

The study yielded a set of results, the most important of which are:

- Inflation targeting is a monetary policy framework through which the central bank can achieve low inflation rates in the short term، and maintain price stability in the long term.
- It is difficult to implement the policy of inflation targeting in Algeria، because monetary policy faces many challenges and difficulties، the most important of which is the inability of the Central Bank to achieve complete independence، Algeria’s economic dependence to a large extent abroad and the high government support for goods;

Based on the results obtained, the following can be suggested:

- The central bank must be given complete independence in drawing up and implementing its monetary policy without being subject to political considerations;
- Central banks should work on developing technical capabilities for accurate prediction and prediction of inflation rates and work on building standard models that link and determine the nature of the relationship between the inflation rate and the various monetary policy tools.

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