

The problem of time-inconsistency in the implementation of the inflation targeting strategy - Algeria's Experience -

مشكل عدم الاتساق الزمني في تنفيذ إستراتيجية استهداف التضخم-تجربة الجزائر-

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Abstract:

The objective of this study is to highlight the problem of time inconsistency in the implementation of monetary policy in Algeria as part of the targeting strategy to narrow and reduce the problem of consistency.

We have come to the conclusion that the problem of time inconsistency is natural and may be caused by the expectations of the private sector. In the case of Algeria, the problem of inconsistency became apparent in the transition period of the Algerian economy.

Keywords: Time inconsistency; Monetary Policy; inflation targeting; Algeria

ملخص:

نهدف من خلال هذه الدراسة إلى إبراز مشكل عدم الاتساق الزمني في تنفيذ السياسة النقدية بالجزائر في إطار إستراتيجية الاستهداف لتضييق مشكل الاتساق والتقليل منه.

توصلنا لنتيجة مفادها أن مشكل عدم الاتساق الزمني مشكل طبيعي وقد يحدث بفعل توقعات القطاع الخاص، وفي حالة الجزائر مشكل عدم الاتساق بدا واضحا في الفترة الانتقالية لاقتصاد الجزائر أما في الفترة التي تلي اعتماد إستراتيجية استهداف التضخم بدا الاتساق الزمني غير بارز وإنما ضيق، وعليه لا يمكن القول بأن إستراتيجية استهداف التضخم تقلص من مشكل عدم الاتساق الزمني لأن السلطة النقدية لازالت بعيدة عن التطبيق الفعلي لإستراتيجية الاستهداف.

كلمات المفتاحية : عدم الاتساق الزمني ; السياسة النقدية; استهداف التضخم ; الجزائر
تصنيفات JEL: E52;

1. Introduction :

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Many central banks in different countries have adopted monetary policies that differ from traditional ones, known as the inflation-targeting strategy, the purpose of which is to control the overall rise in the price level, by the central bank estimating target inflation then attempting to direct actual inflation towards the target using tools such as: Changes in interest rates, and monetary policy. Generally which are beset by many problems and obstacles. The most important of which is perhaps the problem of consistency with the time discovered by Gordon and Barrow. Algeria like other States that have adopted an inflation-targeting strategy, have encountered and continue to face many problems, in terms of providing the necessary conditions for such a policy, as well as the problem of time consistence (Consistency with time), which is seen by some as weakening its impact; or at least minimizing its impact on the implementation of monetary policy in particular:

The main question of this study is determined by the following problem: **Could the inflation-targeting strategy be a way to solve the problem of time inconsistency in the implementation of monetary policy in Algeria?**

To answer this problem, we set out the following main premise: - The inflation targeting strategy makes the Monetary Authority more committed to its long-term and short-term objectives, thereby reducing the problem of time consistency.

The importance of this paper is represented in the importance of monetary policy in general, and of the inflation-targeting strategy in particular, as a modern framework for monetary policy, where many countries have succeeded in achieving many objectives based their background, which have helped developing countries follow its lead. In order to pursue gains such as stabilization of the general price level and reduction of inflation rates. However, the implementation of monetary policy is confronted with a problem of temporal inconsistency, which leads to the creation of a parallel between the implementation of the inflation targeting strategy and the problem of temporal inconsistency.

This research paper mainly aims to:

- Demonstrate the strategy of targeting inflation as a modern monetary policy framework that is flexible in contrast to traditional monetary policy,

which is a recent strategy adopted by many States, with results in reducing inflation rates.

- highlight the problem of time consistency and how it occurs during the implementation of monetary policy, and within the framework of targeting, which serves as a flexible monetary policy system, while demonstrating the importance of the targeting strategy for solving or at least reducing this problem.

- analyze the problem of time inconsistency, particularly in a State that lacks the strong institutional framework and the capacity to adhere to the course and objectives of monetary policy, taking Algeria as a case by tracking the reality of the application of the inflation-targeting strategy, and the effectiveness and effectiveness of this policy in reducing the problem of time consistency in case it occurs.

This research paper has been divided into the following axes sections:

1.Introduction.

2.Theoretical approach to the problem of time inconsistency in monetary policy.

3.Performance of monetary policy in Algeria during the period(1990-2018).

4.The reality of inflation targeting in Algeria under the problem of time inconsistency.

5.Conclusion.

2.Theoretical approach to the problem of time inconsistency in monetary policy

Monetary policy is considered crucial in implementing economic policy objectives in general, as it is linked to strategic indicators affecting the overall balance of the economy. However, the problem of time asymmetry has been recently discovered in the implementation of traditional and modern monetary policy.

2. 1 The concept of time inconsistency: The problem of time inconsistency is a widely discussed problem at the current time, this is why we are trying to highlight its concept and how to detect it:

Barroo Gordon explained the consistency of time in policy-making, especially in countries that lack a strong institutional framework and the

ability to adhere to the path and objectives of monetary policy, they explained the inconsistency of monetary policy with time and returning it to the discretionary system of monetary policymakers, thus that central bankers can print more money and make inflation more than people's expectations. The benefits of this spectacular inflation may lead to more economic activities or a reduction in government debts, but if people realize this, because of their logical expectations, which were met with it the policy maker then will never achieve his goal, simply because of the fact that inflationary benefits become better when it is unexpected, and given the increase in the money supply, the price level will grow, which will have negative consequences for the policy makers. (Ali Hussein Samadi, 2017, p. 4)

Kydland and Prescott discovered a seemingly harmless problem resumed in the strength of expectations in the framework of policy planning, which is the problem of time asymmetry, there upon that in the late 1960s the role of expectations was thoroughly investigated, and they found that they were important variables, which could determine economic outcomes. Academic such as Milton Friedman and Edmund Phelps previously contributed in this line of research in the framework of monetary policy, Robert Lucas later introduced the concept of "logical" expectations, according to which individuals shape their expectations rationally by using all the information available to them, including information on the functioning of the economy and government objectives. This concept implies that the government (or monetary authority) cannot systematically deceive market participants by pretending to follow a particular policy, and then acting differently lately, using this argument, Kidland and Prescott have incorporated government behavior into their model, assuming that individuals form logical expectations, they have also shown that even if the government and its citizens are pursuing to achieve the same objectives. That is the aggrandizement of the population's welfare, the discretionary policy is undergoing a major time symmetry related problem. The main problem is that optimal government policy at a given time may not be ideal at a later date, and since individuals pose rational expectations, they understand that the Government has this incentive to deviate from its previously stated policy and act accordingly. (Mersch, 2006, p. 1)

As **Kydland and Prescott** showed, in this model the central bank's desire to reduce unemployment to the natural rate leads to time-inconsistent behavior. Suppose that the inflation target is 2%; the optimal monetary policy recognizes that workers cannot be systematically fooled and consequently, the unemployment rate cannot depart from the market-clearing rate. It is here that .The central bank announces that it will set monetary policy that equals inflation 2%, and then follow through on that announcement and commit to the announced rate which is known as the strategy of inflation targeting. But this optimal policy is time-inconsistent and will not be implemented. If workers believe the central bank's financial policy announcement and negotiate a contract with firms providing for a 2% nominal wage increase, then the central bank's range of options changes and instead of following through and implementing the announced policy, the central bank can create a slightly bigger amount of inflation which lowers workers' real wages, stimulating firms' demand for labor. With the nominal wage rate fixed, the labor market now stabilizes at a lower unemployment rate. Thus, at the cost of slightly higher inflation, the economy reaps the benefit of unemployment reduction. Kydland and Prescott showed that, the central bank would find it advantageous to create inflation surprise and not implement the announced policy in an attempt of balancing these costs and benefits. Workers will soon figure out that Algeria's bank announcements lack credibility, and they will begin to expect higher inflation, it becomes gradually more expensive for the central bank to create an inflation surprise. The equilibrium result is that inflation increases to the point where the central bank realizes that the advantages of any additional inflation surprises are fully offset by their costs. The central bank has no motive to create an inflation surprise at this inflation rate. However, because there are no inflation surprises, workers completely predict the inflation rate, and the labor market clears at a higher market-clearing rate that dominates not on the natural rate of unemployment. Unfortunately, the fact that the central bank can change its policy after wages are set leaves the economy with efficiently high inflation. However, it

is known as the discretionary inflation bias when there is no reduction between the average inflation rate and the inflation target. (Dennis, 2003)

From the above, it can be argued that the problem of time inconsistency is shaped by the tendency of economic policymakers to announce a particular policy to influence expectations, and then to undertake a contrary policy later after expectations are built, affecting the central bank's credibility in managing policy in general.

2. 2 Time inconsistency problem and inflation targeting strategy: We will highlight the role of the inflation-targeting strategy in reducing the problem of time inconsistency, where there are views in favour of this strategy (the inflation-targeting strategy), which, in our view, limits the problem of time inconsistency by committing to the stated goals, providing credibility, transparency and accountability. The sacrifice rate in this policy, which is what we show, as follows:

The inflation-targeting strategy constitutes a monetary policy framework characterized by the public announcement of quantitative targets (or target ranges) for the rate of inflation over one or more time horizons, as well as the explicit recognition that a stable drop in the rate of inflation is the main long-term objective of monetary policy. (Charles Freedman, *Why Inflation Targeting?*, 2009, p. 12)

Svensson (2010) describes inflation targeting as a monetary framework adopted by the Monetary Authority, which explicitly informs the public that low and stable inflation is the main objective of monetary policy. In its decisions, the Monetary Authority is based on inflation expectations, enjoys a high degree of political autonomy, is usually associated with enhanced standards of communication of monetary authorities with the general public, and aims to increase accountability, possibly through implicit incentives or explicit contracts for central bankers. Advocates of this approach argue that these manifestations of monetary policy management make the central bank's stated inflation targets more credible, as well as addressing the problem of time consistency by cementing inflation expectations. (Rieth, 2017, p. 1)

The central bank adopts this measure or strategy to make the public believe that prices will continue to rise. It stimulates the economy by getting the public to buy things now before they cost more, while prices are

still low, and this "buy more now" philosophy stimulates the demand needed to increase economic growth. (Amadeo, 2020) Here, it is important to make clear that there are two fundamental dimensions towards greater transparency on the part of banks. The first is the relationship between transparency and the effectiveness of monetary policy, and the second is the link between transparency and accountability. The first dimension is linked to the general public's understanding, either directly or through the media, of the Monetary Authority's measures and plans, which makes it critical of these plans. (Charles Freedman, *Inflation Targeting Pillars : Transparency and accountability*, 2009, p. 3) Openness and transparency in monetary policy management are generally important ways to improve credibility, as holding the central bank publicly accountable for its decisions would raise the incentive to achieve the stated inflation target, thereby enhancing public confidence in the ability of monetary authorities to do so. (Silva, 2019, p. 21)

The second dimension of accountability, which is a corollary of central bank independence, further strengthens central bank independence and gives greater impetus to the central bank in achieving the level of targeting, reporting decisions and procedures in a transparent manner with the public, in the sense that transparency is inherent in accountability and whatever other arrangements for democratic accountability, their scope is limited without transparency because information about behaviour is necessary to assess their performance and where the reasons for a decision are. (M.Hoeberichts, 2000, p. 2) .As conflicts of interest arise, policymakers find an incentive to deviate from declared policy; various solutions have been proposed to the problem of time consistency in monetary policy in which accountability plays an important and essential role, either directly or indirectly. (Bernard J.Laurens, 2009, p. 97)

Bernank Wolbajo Mishkin (2001) also showed that the sole mandate to target inflation could help to overcome the problem of time asymmetry. The inflation target could help to stabilize inflation expectations, even since the adoption in 1989 of a single mandate to target inflation by the Reserve Bank of New Zealand, and several empirical studies showed that the

adoption of a single mandate to target inflation led to a significant reduction in inflation expectations in both developed and developing countries. (J .Scott Davis, 2015, p. 2)

From the foregoing, it can be argued that the problem of time consistency is essentially when monetary policy is managed on a discretionary basis, away from monetary policy rules, as it occurs when monetary policy makers tend to achieve a low inflation target, and quickly resort to a short-term swap on the Philips curve between inflation and output or between inflation and unemployment, by allowing the inflation rate to increase for output gains, and by virtue of the good expectations of the central sector, they realize that the bank is not credible. That is why there is a suggestion that inflation-targeting policy is the solution in reducing the problem of time consistency, by adhering to stated goals with credibility and transparency in the central bank, which makes the sacrifice between inflation and output less.

3. Performance of monetary policy in Algeria: In executing monetary policy, countries rely on two approaches: economic expansion and inflation reduction, that in by raising the interest rate on loans, raising the interest rate on the monetary reserve, in addition to putting up securities for sale and purchase, and the second is the one approach we are interested in here by presenting the development of monetary policy instruments in Algeria.

3. 1 Development of interest rates in Algeria: Interest rates are considered one of the main determinants of monetary. Expansion in Algeria. Developments in loans interest rate can be explained further more by the following table:

Table 1. Real interest rates in Algeria in the period (2007-2020) Unit: %

Year	Real interest rate	Year	Real interest rate
2007	1.51	2014	8.33
2008	-6.34	2015	15.45
2009	21.57	2016	6.35
2010	-6.99	2017	3.15
2011	-8.65	2018	0.41
2012	0.51	2019	8.51
2013	8.10	2020	14.30

Source: <https://ar.knoema.com/atlas> ,date of viewing 06/05/2022

Algeria's real interest rates have experienced many changes and disruptions from 2007 to 2020, as shown in table 1. In 2015, the increase in it was notable that the rate had risen to 15.45, only to decrease in the years that followed, and it is important to note that the real interest rate was the difference between the nominal interest rate and the inflation rate. In economies with flexible exchange policies, the higher the real interest rate, the greater the central banks' ability to cut the interest rate to support the economic recovery, assuming no significant increases in the inflation rate. (ELMONIM, 2020, p. 6)

3.2 The evolution of open market operations size in Algeria: Monetary policy is primarily aimed at increasing the well-being of society, which is measured in terms of the quantity and quality of goods and services consumed by people. (R.Szulczuk, 2014, p. 174) That is why we attempt to show the role of monetary policy instruments and their evolution extent over the previous period. In the context of monetary policy management, the Bank of Algeria intervenes through open market operations, through temporary waiver and the recovery of liquidity through bidding. (Algeria B. o., Annual Report 2008 Economic and Monetary Development of Algeria(AR), 2009, p. 178) Open market operations have experienced very concerted or near-zero growth over the past years, which was reflected in the clear performance of monetary policy, as shown in the next table.

Table 2. Open market operations in Algeria during the period (2017-2018)

Year	For 7 days	For 3 months	For 6 months	For 12 months
2017	3.50	3.50	3.50	3.50
2018	3.50	-	-	-

Source: Bank of Algeria, Triple Statistical Bulletin No. 45, March 2019, p. 17

We can see from the above table that the open market operations of the newly used instruments for implementing monetary policy in Algeria can be explained in monetary terms by the decline in bank liquidity in parallel with the deficit in the overall balance of payments balance, despite the liquidity generated by the financing of the budget deficit, and the return of the Bank of Algeria to refinancing beginning from the month of OTT 2016, which was the year of radical change in the management of monetary policy.(Through open market operations), in order to ensure the refinancing of the banking system, bank liquidity moved from 821 billion dinars at the end of 2016 to 512 billion dinars at the end of September 2017. This improvement in bank liquidity is accompanied by the return of bank refinancing operations by the Bank of Algeria, especially open market operations with different maturity periods starting from March 2017. (Algeria B. o., Annual Report 2017 Economic and Monetary Development of Algeria (AR), 2018, p. 13)

We also sense that the Bank of Algeria was reintroducing open market operations to inject liquidity with different maturity dates, while making the rate of interest for operations.(7) Days, a main channel to manage Monetary Policy, where liquidity infusions, which reached DG 555.6 billion in October 2017, by containing the strong decline in bank liquidity and maintained it at a level commensurate with the 12.3% growth in economy-oriented loans in 2017, corresponding to 8.7% in 2016. These monetary policy processes were reflected in the stabilization of reserves, which went from 121.9 billion dinars by the end of 2016 to 233.6 billion dinars by the end of October 2017. (Algeria B. o., Annual Report 2017 Economic and Monetary Development of Algeria (AR), 2018, p. 133)

3.3. Size of the cash reserve in Algeria: The evolution of cash reserves in Algeria can be illustrated by:

Table 3. Evolution of total reserves in Algeria during the period (1991-2020)

Unit: % of the total external debt

Year	1991	1992	1993	1994	1995
Total reserves	12.14	12.12	13.91	15.91	12.59
year	1996	1997	1998	1999	2000
Total reserves	18.70	31.28	27.53	21.78	53.22
year	2001	2002	2003	2004	2005
Total reserves	86.25	109.13	149.10	203.73	346.16
year	2006	2007	2008	2009	2010
Total reserves	1378.19	1874.18	2370.94	2090.20	2347.84
year	2011	2012	2013	2014	2015
Total reserves	3155.47	3636.69	3840.12	3375.22	3223.79
year	2016	2017	2018	2019	2020
Total reserves	2210.95	1837.35	1530.23	1307.21	1147.48

Source: https://data.albankaldawli.org/indicator/FI.RES.TOTL.DT.ZS?fbclid=IwAR35pi_xwIVrk09FsPkvJ7P6Bfzli79ByEsFuHQDxeiRCBI94I80MBK69qxo&locations=DZ-MA-TN-EG&view=chart , 04/02/2022.

Through table 3 we show the size of reserves as a percentage of external debt, knowing that minimum mandatory reserves are a special institutional means of monetary policy, which is not translated into Bank of Algeria interventions, but rather by the fact that Bank of Algeria deposits must be formed in order to cover the level of compulsory reserves at a

monthly level (from 15 to 14 months). The percentage of legal reserves in Algeria during the period 1998-2018 is as follows:

Table 4. Development of the percentage of compulsory reserves in Algeria during the period (2001-2020) Unit: %

Year	2001	2002	2003	2004	2005
percentage of compulsory reserves	3	4.25	6.25	6.5	6.5
year	2006	2007	2008	2009	2010
percentage of compulsory reserves	6.5	6.5	8	8	9
year	2011	2012	2013	2014	2015
percentage of compulsory reserves	9	11	12	12	12
year	2016	2017	2018	2019	2020
percentage of compulsory reserves	8	4	10	10	3SEP

Source: Prepared by researchers based on the data of the Central Bank, the three statistical bulletins are from 1990 to 2020.

We can see from the table that the compulsory reserve mechanism was adopted in 2001 at a rate of 3%, to be raised after which, according to the Bank of Algeria, this change in the compulsory reserve ratio changes the size of the money supply multiplier, the deposits multiplier as, the lower compulsory reserve rate increases the value of the multiplier, and the higher compulsory reserve rate reduces the value of the multiplier it is for this case that the change of the compulsory reserve an enforcement or undermining to the power of open market operations, or borrowing banks in changing the offer of cash. Banks raised their assets in the Bank of Algeria accounts by late 2012, with the compulsory reserve rate at 12% in 2013, and bank loans and cross-borrowing resumed in May and June 2013 in the monetary market, at interest rates of 2%. There is thus the beginning of a decline in excess liquidity coupled with a reduction in the deposits of the fuel sector.

3.4. Development of the rediscount rate in Algeria: The development of the discounting tool in Algeria can be illustrated in the following table:

Table 5. Development of the rediscount rate in Algeria during the period (1993-2020)

Unit: %					
Year	1993	1994	1995	1996	1997
The rediscount rate	11	15	14	13	11
year	1998	1999	2000	2001	2002
The rediscount rate	8.5	8.5	6.5	6	5.5
year	2003	2004	2005	2006	2007
The rediscount rate	4.5	4	4	4	4
year	2008	2009	2010	2011	2012
The rediscount rate	4	4	4	4	4
Year	2013	2014	2015	2016	2017
The rediscount rate	4	4	4	3.5	3.75
Year	2018	2019	2020		
The rediscount rate	3.75	3.75	3.75		

Source: Prepared by researchers based on the data of the Central Bank, the three statistical bulletins are from 1990 to 2020.

Note from Table 5 that the rate of refunds since 1990, which coincides with the passage of the Monetary and Loan Act, has averaged from 10.5% to 15%. By the beginning of 2000, the reduction in the rate of refunds began gradually to be waived until 2018 at a rate of 3.75%, where, in the context of refunds and loans to banks and financial institutions, the Central Bank. The Bank of Algeria could return the rebate or, under the regime of the Secretariat, take from banks or financial institutions bonds secured by

Algeria or by abroad that represent business operations, which require at least three natural or moral persons with a certain sol, but not more than six months of insurance.

4. The reality of inflation targeting in Algeria under the problem of time inconsistency: The strategy of targeting inflation is a new approach taken by many developed and emerging countries, which, through a serious and effective commitment to the stated objectives, have been able to adhere to the target inflation rates, which has reduced actual inflation rates and led mainly to a stabilization of the overall price level.

4.1 The evolution of inflation and the monetary mass in Algeria: The first period was defined after the issuance of the money and Loan Act (after 1990).with major developments of the monetary mass with its different components. Which is inspires the path the monetary policy took at its beginning. We have focused here on addressing the monetary mass and the monetary expansion that Algeria has experienced, mainly because of its association with inflation, as reflected in the quantitative theory of money, where Friedman considered inflation to be a monetary phenomenon, caused by the expansion of monetary issuance in a way leading to a rise in aggregate demand from aggregate supply, resulting in a rise in the overall level of prices, as well as in the increase in prices. As shown in the following table.

Table 6. Development of the monetary mass during the period (2011-2018)

Unit: billion DA

Year	2011	2012	2013	2014	2015	2016	2017	2018
M2	9929.2	11015.1	11941.5	13686.8	13704.5	13816.3	14974.6	16159.2
M1	7141.7	7681.5	8249.8	9603	9261.1	9407	10266.1	11404.1
Cash trading outside the C.B	2571.5	2952.3	3204	3658.9	4108.1	4497.2	4716.9	4926.8

Source: 2011-2012, Bank of Algeria, Triple Statistical Bulletin, March 2016, p 11
2013-2018, Bank of Algeria, Triple Statistical Bulletin, June 2019, p 11

From table 6, we note that the monetary mass has increased clearly through 2015, where the increase was very slight or unclear, and why 2015 was different from the years 2011 to 2014, where the average growth of the

M2 monetary mass was estimated at (13.4%) annually, and the combined monetary position (counting deposits with the public treasury and the Postal Instruments Centre) was characterized by near-zero growth of the M2 cash block at 0.13%. (Algeria B. o., Annual Report 2015 Economic and Monetary Development of Algeria (AR), 2016, p. 131)

From table 6, we note that the M2 monetary mass rose by 6% during the first nine months of 2017. This rise has been attributed to the main components of the monetary mass: (Algeria B. o., Annual Report 2017 Economic and Monetary Development of Algeria (AR), 2018, p. 13)

- On-call deposits at the bank level are 7%.

- postcard centres 6.9%.

- term deposits 5.5% and cash trading 7.2%.

As a result, on-call deposits at the bank level accounted for 46.1% of total deposits, term deposits accounted for 53.9%, and the share of cash trading in the M2 cash bloc increased slightly, from 32.2% in September 2016 to 32.9% in September 2017.

Table 7. Evolution of actual and target inflation rates during the period (2000-2018) in Algeria

Year	2000	2001	2002	2003	2004	2005	2006
Inflation rate							
%	0.33	4.23	1.42	2.58	3.56	1.64	2.53
Total consumer price index	/	557.59	565.49	580.10	600.78	610.62	626.09
Inflation outside food	/	2.96	2.57	1.46	3.40	3.82	0.98
Year	2007	2008	2009	2010	2011	2012	2013
Inflation rate							
%	3.51	4.88	5.74	3.91	4.52	8.89	3.26
Total consumer price index	672.56	123.99	131.10	138.47	145.32	155.05	160.10
Inflation target%	/	/	/	/	4	4	4
Inflation outside food	0.77	2.81	3.73	3.64	4.78	6.09	3.32
Year	2014	2015	2016	2017	2018		
Inflation rate							
%	2.92	4.78	6.40	5.59	4.27		
Total consumer price index	164.77	172.65	183.70	193.97	202.25		
Inflation target							
%	4	4	4	4	/		
Inflation outside food	-0.10	4.86	9.11	6.09	5.03		

Source: 2000-2006,Bank of Algeria, Triple Statistical Bulletin, September 2007, p24
2007, Bank of Algeria, Triple Statistical Bulletin, Mars 2007, p24
2008-2011,Bank of Algeria, Triple Statistical Bulletin, December 2012, p29
2012-2014,Bank of Algeria, Triple Statistical Bulletin, December 2015, p29
2015-2019,Bank of Algeria, Triple Statistical Bulletin, December 2019, p29

We can see from table 7 that the estimated quantitative inflation target ranges from 4% during the period when the Inflation Targeting Strategy was announced. In 2015, precisely the actual inflation rate was very close to the target. This year's target inflation rate was determined on the basis of an average oil price of \$59.7 per barrel. (Algeria B. o., Annual Report 2015 Economic and Monetary Development of Algeria (AR), 2016, p. 131)

Although inflation rates peaked in 2012, measured by the annual average consumption index, at 8.89%, monetary policy was effective in achieving financial stability, especially as indicators of the financial rigidity of the banking sector improved, the latter being a solid banking system, with a high sol of 20.8% and large private money yield of 23.3%. (Algeria B. o., Economic and monetary developments for 2012 and the elements of the first six-party orientation of 2013- The Governor of the Bank of Algeria intervened before the National People's Assembly(AR), 2013, p. 16)

We also note that inflation rates have begun to rise clearly, with the price index at consumption reaching 6.4% in 2016. This rise in inflation does not appear to be due to the classical determinants of inflation, but mainly to the deficiencies in market control and dominant positions in most consumption markets. (Algeria B. o., Annual Report 2017 Economic and Monetary Development of Algeria (AR), 2018, p. 13)

The inflation targeting rate for 2017 was set at 4% by the Monetary and Loan Board, while the actual inflation rate for this year was 5.59%, a decrease from the previous year, the growth rate of the M2 cash block at 4.7%, and the rate of loan growth for the economy at 13.5%, where inflation, monetary aggregates and loan targets were forecast at an average oil rate of \$57 per barrel, and at the end of 2017, the average of oil price reached 54\$ per barrel; with regard to monetary expansion, 8.3% was higher than expected 4.7%. (Algeria B. o., Annual Report 2017 Economic and Monetary Development of Algeria (AR), 2018, p. 133)

4.2 The reality of inflation targeting in Algeria: The inflation targeting strategy is initially adopted flexibly, by reducing the inflation rate in the medium term (about three years), and this flexibility is linked to the central bank's ability to maintain a good link to inflation expectations in the medium term.

In accordance with Order No. 10-04, amending and supplementing to Order No. 03-11 on cash and loans, price stability was established as an explicit objective of monetary policy. The importance of targeting inflation was also commended. (Algeria B. o., Annual Report 2012 Economic and Monetary Development of Algeria (AR), 2013, p. 177) where as it was

stated that, the application of this strategy in Algeria on the medium term requires developing suitable tools that allow reinforcing the analytical framework supporting the formulation of the monetary policy and flexibly applying it by the Bank of Algeria. The role of the Bank of Algeria is to stabilize this sector by ensuring the safety and security of this sector. The Bank of Algeria was given wider powers in 2010 and to carry out any investigation at the level of banks and financial institutions, there by strengthening the capacity for early detection of weaknesses by better monitoring banks and financial institutions. As in with the regulation for total precautionary tools, it is from the power of the monetary authority (the Monetary and Loan Board), whose functions also include micro-precautionary regulation, and the management of macro-precautionary policy belongs to the Bank of Algeria. (Algeria B. o., Annual Report 2013 Economic and Monetary Development of Algeria (AR), 2014, p. 184)

Once the policy of targeting inflation has been adopted, the Central Bank is obliged to give priority to inflation in the same way as other targets. But what characterizes the growing countries including Algeria is their markets weakness and the correlation of their currency to the other foreign powerful currencies like: Dollar and Euro. (Bonoï Choaib, 2019, p. 208)

The Bank of Algeria should submit to the Monetary and Loan Board at the beginning of each year forecasts of monetary and loan totals resulting from financial programming during the year. These quantitative targets are revised in accordance with the evolution of the national and international economic and financial situation and the impact on the foundations of the national economy. The Bank also proposes the means of monetary policy that must be put to achieve the policy objective of price stability. (Algeria B. o., Annual Report 2017 Economic and Monetary Development of Algeria (AR), 2018, p. 132)

Many industrialized countries have successfully implemented the inflation targeting strategy to provide a strong banking apparatus, a serious commitment to the stated objectives of these countries, as well as the conditions for the targeting strategy. Increasing transparency, holding the central bank accountable, and taking a future look at an inflation rate are conditions for targeting. The central bank must therefore enhance this transparency by intensifying communication with the public and markets to

explain the objectives, enabling economic agents to make decisions in a environment of transparency and certainty about future forecasts. Along with transparency, it is essential for accountability to be provided through the existence of an accountability body for the Central Bank, which does not exist in Algeria. Its role is to hold the Central Bank accountable for its objectives and the extent to which they have been achieved. A particular body must be appointed, whether in Parliament, the Government or an independent body appointed by the President of the Republic. Although the inflation rates achieved in Algeria range from 0 to 5%, these limits are suitable for the implementation of this strategy if combined with strong management by the monetary authority. Taking into account the open budget index, Algeria received a poor rating, which means that the government gives limited information to the public about the central government budget and financial activities during the fiscal year, which creates difficulties for the public in holding the government accountable about public finance management. This indicator assesses the type and amount of data provided by the government to the public in the eight main documents. The proposed executive budget document is one of the most important documents, which should be available to the public and the legislature at least three months before the financial year begins to allow for an adequate audit, which is not available in Algeria. The evolution of the open budget index in Algeria during the period 2010-2019 can be illustrated by the following table:

Table 8. Algeria's Open Balance Index during the period (2010-2019) Unit: %

Year	2010	2012	2015	2017	2019
Indicator	1/100	13/100	19/100	3/100	2/100

Source: <http://survey.internationalbudget.org/#profile/DZ> , Date of observation 04/02/2022

The reality of inflation targeting in Algeria can be further analyzed on the basis of the availability of inflation targeting policy requirements and conditions by:

A/ Independence of the Central Bank:

The independence of the Central Bank means that it is not subject to government directives, as opposed to the state of dependence in which monetary policy is formulated by the Ministry of Finance, the Central Bank is independent when it is a separate regulatory entity from the Government. On the other hand, monetary policy can be implemented in accordance with the decisions of the members of the Central Bank without direct influence from the Government. (Ali Snonsi, 2019, p. 17)

The Bank of Algeria has a range of powers and tasks set out in article 35 of Ordinance No. 03-11 of 26 October 2003 on cash and loans. Whereas this article states that the mission of the bank of Algeria in domains of cash, loan and exchange is represented in providing and maintaining the best conditions for the rapid growth of the economy while ensuring the internal and external stability of cash. The intervention of Algeria's Bank is to manage the monetary policy through a monetary usage that includes its operations with banks outside the monetary market (rediscounts, takeovers and grants of trusts, liquidations) and within the monetary market (open market operations by temporary waiver and recovery of liquidity through bidding) as well as following regulation in the area of compulsory reserves. (Algeria B. o., Annual Report 2008 Economic and Monetary Development of Algeria (AR), 2009, p. 178)

B/transparency and accountability: A prerequisite for the successful implementation of the inflation targeting policy is the availability of a transparency and accountability requirement for the central bank as it allows an estimate of the inflation rate and enhancing transparency usually by intensifying communication with the public and markets to explain its objectives, enabling economic agents to make their decisions in an atmosphere of transparency and certainty, The element of transparency required a body that is accountable the central bank, which did not exist in Algeria to ask the Central Bank how far it had achieved the goals. A body charged with this task must therefore be determined primarily by Parliament or by an independent body appointed by the President of the Republic. (Bosyala, 2015/2016, p. 132)

C/Advanced infrastructure and technology: One of the prerequisites for targeting inflation is to focus on accurately determining a rate of future

inflation, where the central bank makes reliable expectations and explicitly announces them to the public. Therefore, it must have an evolved infrastructure which ensures that it delivers expectations efficiently. (Hamza Al Awadi, 2014, p. 78)

D/The official announcement of digital targets for the medium-term inflation rate that the central bank seeks to achieve and the fixed-term period: In 2016, after the Monetary and Loan Board was briefed on the objectives for the development of cash and loan totals in line with the inflation target of 4%, knowing that the forecast of inflation targets and cash and loan totals based on an average petroleum price hypothesis is estimated at 45.6\$ per barrel in the same year, where the average of oil price reached 45\$ per barrel (Algeria B. o., Annual Report 2016 Economic and Monetary Development of Algeria (AR), 2017, p. 138)

E/Adoption of price stability as a clear and explicit objective of monetary policy action: The monetary authority is committed to stabilizing the overall price level as the main long-term objective of monetary policy with its commitment and pledge to achieving the planned goal. (Abohat Ala 'a Sadoun, 2018, p. 185) as amended and supplemented by Ordinance No. 03-11 on Cash and Loan, price stability is an explicit objective of monetary policy, justifying the importance of inflation targeting and the policy became important compared to the quantitative objective of cash and loan, which can be considered an intermediate target. (Algeria B. o., Annual Report 2012 Economic and Monetary Development of Algeria (AR), 2013, p. 176)

F/The overall information strategy: Advanced technical mechanisms for forecasting domestic inflation, since inflation forecasting is of great importance. Since 2009, the Bank of Algeria has developed an appropriate tool that responds to the concern of forward-looking (This single variable model of time chains) takes into account the memory provided by the historical monthly series of price indicators at consumption, which initially aimed to predict inflation rate in the short term, meaning the monthly forecast of its developments over a single year's horizon. The Bank of Algeria has deepened the analysis of inflation determinants, which allowed

for the development of an inflation forecast model over 24 months beginning in 2012. (Algeria B. o., Annual Report 2012 Economic and Monetary Development of Algeria (AR), 2013, p. 177)

Based on the foregoing, it can be argued that Algeria's transparency and accountability requirement is not available that no regular periodic bulletins are issued every year on the progress of targeting policy path and are not shared with the public except for annual reports, which are in the form of a summary the development of annual economic indicators. which gives the impression of a weak infrastructure for pursuing inflation targeting, Institutional commitment that stabilization of the overall level of prices is the ultimate and fundamental long-term objective of monetary policy is not clear throughout the period of adoption of targeting, where responded with reports sometimes stating that stabilization of the overall level of prices is the primary objective and sometimes higher rates of economic growth. Therefore, there is no clarity in the order of priorities and objectives. However, the requirement to declare a digital inflation target is available and in the Bank of Algeria's annual reports mention the ratio but implicitly as a form of reminder of the importance of targeting.

4.3 The problem of time inconsistency in the implementation of the inflation-targeting strategy in Algeria:

The problem of time-inconsistent implementation of monetary policy in Algeria can be illustrated by the conflicting declaration of objectives by the monetary authority since independence through the transition of period to the issuance of the Monetary and Loan Act to the issuance of recent instructions and orders showing that the stability of the overall price level, i.e. the control of inflation, is the ultimate objective. According to Order No. 10-04, amended and supplemented by Order No 03-11.

This represents a legal establishment of price stability as an explicit objective of monetary policy, as well as a reform of the monetary policy framework, highlighting the importance of targeting inflation. According to this, the stability of the overall price level is the paramount objective. The problem of time inconsistency is further clarified in the table below:

The problem of time-inconsistency in the implementation of the inflation targeting strategy - Algeria's Experience -

Table 9. The evolution of unemployment and gross product in Algeria during the period (1999-2014) Unit: %

Year	1999	2000	2001	2002	2003	2004	2005	2006
Unemployment rate	29.3	28.89	27.3	25.7	23.7	17.7	15.3	12.3
Gross product growth rate	3.02	3.8	3	5.6	7.2	4.3	5.9	1.7
Year	2007	2008	2009	2010	2011	2012	2013	2014
Unemployment rate	13.8	11.3	10.2	10	10	11	9.8	10.6
Gross product growth rate	3.39	2.39	1.60	3.6	2.89	3.39	2.8	4.09

Source: International Bank - Indicators of Economic Development 05/08/2020 at: <https://data.albankaldawli.org/country/algeria?view=chart>

We note from table number(9) at the begging of the nineties specifically in the interim period of the market economy, with the introduction of the Monetary and Loan Act, inflation was extremely high and thus in order to achieve a low inflation rate, monetary policy makers then resorted to the short-term exchange between inflation and unemployment, with inflation falling until the year 2000 and unemployment rates rising during the same period, but using good expectations, the private sector was aware of the central bank's lack of credibility in managing monetary policy, shifting to other objectives (mainly raising GDP). The private sector builds its expectations on expansionary monetary policy, leading to higher inflation again.(From 2001 inflation rose to 4.23% from 0.33% in the previous year, and unemployment in the same year declined from 28.89% to 27.3%) This makes the central bank inconsistent with the first announced policy of reducing inflation rates.(By raising unemployment rates), in the sense that this transition of period in Algeria's economy has highlighted the time-inconsistent problem in the implementation of monetary policy.

Sometimes the operational management of monetary policy and return to target is adjusted, within a reasonable period, which sometimes requires recourse to other procedures of a structural nature, such as those that contribute to the fight against internal inflation, the latter being distinguished in 2011 and 2012 as in 2009, while the M2 pool (outside of fuel deposits and hard currency deposits) and for a long period (2011-2012) was the main determinant in this area. (Algeria B. o., Annual Report 2012 Economic and Monetary Development of Algeria (AR), 2013, p. 177)

We mentioned earlier that the adoption of the inflation-targeting strategy in Algeria was in 2010 at a target inflation rate of 4% in 2011, meaning that the target announced by the Monetary Authority was a low inflation target, therefore they came to the short-term swap by allowing inflation rates to increase to achieve gains in product, but using good expectations, the private sector realizes the central bank's non-credibility in managing monetary policy and its transformation to achieve other objectives. The sector builds on its expectations, raising inflation rates even higher, with inflation rates rising in 2012 to 8.89%, and product rate rising slightly to 3.39% from 2.89%. This means that the problem of time consistency coincided with the implementation of the inflation-targeting strategy, but improved GDP growth rate in 2012 is due to the recovery of the petroleum market in this period.

5. CONCLUSION :

In the case of Algeria, the hypothesis cannot be emphatically confirmed, although the application of the inflation-targeting strategy has coincided with the improvement in GDP growth rates in 2012, thus achieving the second policy that the Monetary Authority has pursued through the increase in GDP, since Algeria we do not meet the basic conditions for the effective implementation of the targeting strategy, and therefore does not expect to achieve gains from the announcement of this policy only with two years.(2010-2012), but we attribute. The improvement in gross output growth rates during this period primarily to the recovery of the oil market. We can add other results:

- The modest performance of monetary policy, particularly in controlling the volume of the money supply, which is mainly attributable to government pressure through new monetary editions.

- The Government's use of deficit financing policy for public expenditure, which has led to accelerated inflation rates and an imbalance emergence, since the success of monetary policy depends on other complementary policies, in particular, government spending policy.

- The performance of the open market policy in Algeria is quite low and insignificant despite the importance of this market in improving monetary policy performance. This can be explained in monetary terms by the decline in bank liquidity in parallel with the deficit in the overall balance of payments balance, despite the liquidity generated by the financing of the budget deficit, and the return of the Bank of Algeria in late 2016 and the beginning of 2017 for the refinancing policy.

- The problem of time inconsistency in the implementation of monetary policy was clearly apparent in the transition period of Algeria's economy, through a short-term exchange on the Philips curve between inflation and unemployment. The Monetary Authority initially declared the reduction of the inflation rate by raising the rate of unemployment. However, it turned to other endeavors during the same period. But the private sector realized using reasonable expectations the non-credibility of the central Bank in managing the monetary policy. therefore, the central Bank has become inconsistent with the first announced policy.

- The strategy of targeting inflation works on narrowing the problem of time inconsistency in States that meet the requirements of targeting and that have effectively adhered to the scope of the declared inflation. In the case of Algeria however, the technical and administrative requirements for proceeding with serious compliance with the stated objectives have not been reached, but remain only estimates issued by the Monetary Authority. Time inconsistency is a natural problem in the case of discretionary monetary policy management without compliance with monetary policy rules. For example, this happens when monetary policy makers declare that they are meeting the low inflation target, they use the short-term trade-off in the Phillips curve between inflation and output or between inflation and unemployment by allowing the inflation rate to increase in order to achieve the gains of increased output or reduce unemployment. However, using

good expectations, the private sector is aware of the central bank's credibility in managing monetary policy and shifting other objectives and endeavors. Its expectations are essentially based on expansionary monetary policy, leading to higher inflation rates without reducing unemployment or increasing output.

The following recommendations could therefore be proposed:

- The necessity to diagnose economic shocks that hit the economy by monitoring daily data and analyzing them in order to determine the type of shock and the depth of its impact, where monetary policy is prepared to cope with supply and demand shocks, whether temporary or sustainable.

- The central bank must have the ability to accurately make the right prediction of inflation rates, which requires an information bank on the data that will enable it to estimate inflation in the short and long term.

- Raising the standard of transparency and accountability, which is considered to be the most important requirement in tracking the inflation-targeting strategy and in complying with stated inflation targets, as it also allows the strengthening of public confidence in the monetary authority.

- In order to reach the stated inflation target, it is important that the monetary authority parallels the targeting of the exchange rate with the targeting of inflation and that they do not trade off between them to achieve better results.

- Abandoning the current exchange system(Floating orbit) and turning to what are known as currency boards because they prevent the problem of time consistency, that currency boards have an important advantage, which is that they probably make a good way to deal with the so-called "currency boards" "Conflict of time" because no discretionary changes can be made in the supply of money and therefore the authorities cannot engineer monetary surprises that can be consistent with previous declarations and thus the Monetary Board avoids erosion of credibility too much.

6. Bibliography list:

Abohat Ala 'a Sadoun, A. K. (2018). Assessment of Iraq's inflation targeting experience. *Journal of the Faculty of Administration and Economics for Economic, Administrative and Financial Studies* , 10 (02), 185-212.

Algeria, B. o. (2009). *Annual Report 2008 Economic and Monetary Development of Algeria (AR)*. Algeria: Bank of Algeria.

- Algeria, B. o. (2013). Annual Report 2012 Economic and Monetary Development of Algeria (AR). Algeria: Bank of Algeria.
- Algeria, B. o. (2014). Annual Report 2013 Economic and Monetary Development of Algeria (AR). Algeria: Bank of Algeria.
- Algeria, B. o. (2016). Annual Report 2015 Economic and Monetary Development of Algeria (AR). Algeria: Bank of Algeria.
- Algeria, B. o. (2017). Annual Report 2016 Economic and Monetary Development of Algeria (AR). Algeria: Bank of Algeria.
- Algeria, B. o. (2018). Annual Report 2017 Economic and Monetary Development of Algeria (AR). Algeria: Bank of Algeria.
- Algeria, B. o. (2013, December). Economic and monetary developments for 2012 and the elements of the first six-party orientation of 2013- The Governor of the Bank of Algeria intervened before the National People's Assembly(AR). 16-28. Algeria.
- Ali Hussein Samadi, A. M. (2017, August 21). Quantum Barro-Gordon game in Monetary Economics. Preprint Submitted to Elsevier , 4.
- Ali Snonsi, S. H. (2019, Mai). Measurement of the Bank of Algeria's degree of autonomy according to the CWN model during the period (1990-2017). Al-Bashir Economic magazine , 5 (1), pp. 17-34.
- Amadeo, K. (2020, Join 18). Inflation Targeting And How It Works. Retrieved from <https://www.thebalance.com/inflation-targeting-definition-how-it-works-3305854>
- Bernard J.Laurens, M. A. (2009). Central Bank Independence, Accountability ,and Transparency. Palgrave Macmillan.
- Bonoi Choaib, b. A. (2019). Economic Inflation Targeting Strategy (1990-2016). Financial and Markets , 6 (2), pp. 208-216.
- Bosyala, M. N. (2015/2016). Targeting Inflation as a Framework for Monetary Policy Management Case Study of Algeria 1990-2013 (Master's Degree in Economics). 132. Faculty of Economics, Business and Management Sciences, University of Algeria 03, Algeria.
- Charles Freedman, D. L. (2009). Inflation Targeting Pillars :Transparency and accountability. International Monetary Fund.
- Charles Freedman, D. L. (2009, April). Why Inflation Targeting? . (09/86) , 12. International Monetary Fund: IMF Working Paper.
- Dennis, R. (2003). Time- Inconsistent Monetary Policies . Retrieved 06 11, 2021, from <https://www.frbsf.org/economic-research/publications/economic-letter/2003/april/time-inconsistent-monetary-policies-recent-research/>
- ELMONIM, H. A. (2020). October 2020 Policy Brief, Available Policy Space to Support Economic Recovery from the Coronavirus Pandemic in Arab Countries. Abu Dhabi: Arab Monetary Fund.

- Hamza Al Awadi, C. J. (2014, October). Inflation targeting policy as a framework for monetary policy management with reference to Brazil, Chile and Turkey's experiences. Strategic vision , 78-105.
- J .Scott Davis, I. (2015). Dealing With Time-inconsistency : Inflation Targeting Vs. Exchange Rate Targeting. Federal Reserve Bank of Dallas Globalization and Monetary Policy Institute.
- M.Hoeberichts, S. C. (2000). Central bank accountability and transparency: Theory and some evidence. Germany: Economic Research Centre of the Deutsche Bundesbank.
- Mersch, Y. (2006, September 11). Monetary Policy And Time Inconsistency In An Uncertain Environment. 1. Speech In Governor Of The Central Bank Of Luxembourg, At The NOBELUX Seminar, luxembourg.
- R.Szulczuk, K. (2014). Money, Banking, and International Finance (2nd Edition ed.). Create space indepent publishing platform.
- Rieth, M. (2017, January 9). The inflation targeting debate. Deutsches Institute fur Wirtschaftsforschung(DIW) , 1.
- Silva, P. R. (2019). Integrated Inflation Targeting. International Settlements(BIS).