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Research Article

Possibility of Adopting the Inflation Targeting Strategy in Tunisia

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Abstract— The failure of the theory of monetary aggregates in the eighties marked the birth of a new policy. This new strategy, also known by inflation targeting, was adopted for the first time by New Zealand in 1990 and later by many other countries. Several emerging countries followed this new policy due to its triumph experience. However, the application of this strategy requires checking some conditions. Therefore, we will study its applicability in Tunisia to examine if the Central Bank of Tunisia can follow inflation targeting rule. The analysis of the properties of this strategy show that Tunisia is not yet ready to follow it in short term.

Keywords- inflation targeting; monetary policy; price stability

I. INTRODUCTION

In order to ensure the credibility and the transparency of their monetary policy, several countries have moved towards inflation targeting. The inflation targeting has appeared in the nineties after the failure of monetarism. However, central banks following this policy do work neither at the same way nor in the same context.

Since the eighties, the Central Bank of Tunisia (CBT) has adopted the strategy of monetary anchor. It targets the monetary aggregate to reach its final goal and ensures the price stability. Since the end of 2002, a debate was moderated between supporters of inflation targeting and partisans of the monetary targeting strategy. Nevertheless, the adoption of inflation targeting in Tunisia requires checking several conditions to its success.

II. THEORETICAL ASPECTS OF INFLATION TARGETING

Economists and monetary policy makers have long believed that the success of monetary policy should refer to a nominal anchor, a variable that the central bank could use to found its decisions. However, the last years, several central banks have turned to a new strategy and adopted a monetary policy framework known at university and political circles by the inflation targeting. As its name indicates, the central bank is supposed to pursue a policy which aims to achieve an inflation goal already fixed.

A. Definition of inflation targeting strategy

Inflation targeting policy is a decision rule which tends to increase the transparency of the monetary policy pursued by the central bank. It's a control of economic agents' anticipations by announcing the level of the targeted inflation with clarity.

Inflation targeting appeared in 1990 in New Zealand. Its practice preceded its theory. The first articles working on this theory were written by [1], [2], and [3]. According to [1], the inflation targeting regime has emerged in recent years in some countries using explicit quantitative targets for inflation where explicit intermediate target, such as aggregate monetary and exchange rate, is absent. According to [2], the inflation targeting regime, such as that adopted by New Zealand, Canada, the UK and Sweden, is interpreted as a regime with explicit inflation target and an implicit target of employment. Without the persistence of employment, an inflation targeting allows to eliminate inflationary bias and to mime an optimum contract of inflation.

The inflation targeting is defined by [3] as a monetary policy framework which consists in announcing a target interval and generally ranges between 1 and 3% and a time horizon generally ranging between one and four years. Besides, this new framework must be followed by a continuous communication with the public concerning the objectives and the plans. This policy will be pursued, consequently, with an increased transparency and a coherence of the adopted policy.

B. The characteristics of the conduct of monetary policy based on a direct inflation target

The determination of a direct inflation target is based on a few guiding conditions. According to [4], the price stability represents a long-term goal of the central bank since the direct

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targeting of inflation has been registered on the assumption that the monetary policy can only affect the nominal variables. Therefore, the authorities following an inflation targeting policy announce explicitly a quantitative inflation target taking the form of a band of price evolution.

Unlike the intermediate targeting strategy, the inflation targeting is characterized by the absence of an intermediate objective. This characteristic results from the instability of the money demand function which led the economists to consider that a direct relation between inflation and monetary policy instruments have a stability relatively higher than the relation money aggregate-instrument and money aggregate-inflation.

A monetary policy oriented to the targeting of the inflation is characterized by its suppleness and its simplicity. It offers to monetary authorities the possibility of more flexibility in their decision in case of deviation of objective targeted compared to that forecasted.

III. PRE-CONDITIONS FOR INFLATION TARGETING

Several recent studies have analyzed the conditions for application of inflation targeting policy and presented the most important one which must be checked to obtain good results by central bank. We will be interested in the most important to study the possibility of pursuing this policy by the CBT.

A. Central bank independence

The most important condition for the implementation of inflation targeting is the independence of the central bank to achieve its goal. The concept attempts to promote the independence of the central bank from the government. Various work showed that the central bank independence generally coincides with a low inflation rate [5].

The central bank needs a total freedom to set its monetary policy instruments in order to achieve its aim already fixed. The independence of its instruments results especially from the absence of its financial needs by the state budget. Besides, there should be no political pressure on the central bank to raise economic growth. The central bank and its monetary policy should not be used for electoral purposes.

Ref. [6] insists that the most successful central banks are those with a simple and clear mission. According to the author, the focusing of the central bank on a main aim allows giving a sense of its responsibility and makes the evaluation of its performance more simplified. Price stability is generally considered as a priority objective assigned to an independent central bank.

According to [7], the legal characteristics of the central bank independence can be united in four points. Firstly, the appointment, the dismissal and the term of office of the central bank governor can describe its independence. Secondly, the process of resolving the conflict between the mission of the central bank to conduct monetary policy and its participation in the budget process gives an idea about this independence. Thirdly, the objectives of the central bank reflect its legal independence. Finally, this independence can be studied by restrictions on the ability of the central bank to lend to the public sector, which limits the interest rate. Ref. [8] considered that a central bank, which profits from an instrumental independence, is that which has freedom to choose the methods and the means to achieve the final objective.

B. Transparency and communication with the public

Transparency is considered as the best way to preserve price stability and ensure the central bank credibility. The continuous communication with the public represents one of the main instruments of the monetary policy transparency. The central bank must provide the public with all the information concerning its strategy, its analysis and its decisions. It must thus publish, continuously, the data and the models used to increase the transparency of its policy. A continuous communication helps the public to understand better the monetary policy of the central bank. A better understanding leads to the credibility and to the effectiveness of the pursued policy.

C. Ability to analyse and to forecast inflation

The third condition for the inflation targeting implementation is the existence of efficient means for the monetary policy analysis. The monetary authorities must be able to model the dynamics of inflation and to forecast the price rise.

In order to have a reliable inflation forecasts, it is necessary that the central bank develop techniques for the realization of such forecasts. These techniques include the capacity to collect relevant data, the skill to analyze and the ability to define an effective model for forecasting inflation.

Statistical needs for inflation targeting are more rigorous than for other strategies. Moreover, the inflation forecast is the basis of any inflation targeting policy. It requires a well-developed analysis including data quality, a construction of a suitable price index, a good modeling and forecasting inflation.

D. Financial system development

In order to be able to adopt inflation targeting, it is necessary that the financial markets of this country be developed enough and the financial institutions be healthy. The effectiveness of the monetary policy is related to the existence of developed financial markets. Besides, the inflation rate can change when financial markets cannot react quickly. Also, the development of financial markets facilitates the construction of monetary policy since the price movements of financial instruments transmit information about market expectations.

Ref. [9] stipulates that, to reduce conflict risk with the objectives of financial stability and to guarantee the effective transmission of monetary policy, capital markets must be developed and banking system must be solid. So, the

development of financial market and indirect instruments of monetary policy is of paramount importance for the proper functioning of the transmission mechanism.

The lack of effectiveness of these indirect instruments make the repercussions on inflation be late [10]. According to [11], a central bank that wishes to follow inflation targeting should try, before adopting this strategy explicitly, to put a developed financial management.

E. Relation between inflation and monetary policy indicators

One of the main preconditions, to have a successful inflation targeting, as described in many empirical studies, is the relationship between inflation and monetary policy leading indicators. This relationship gives a solid understanding of its nature.

Unlike a monetary targeting strategy, the existence of a stable relationship between money and inflation is not crucial for the success of inflation targeting. This new strategy uses all available information to determine better frameworks for the monetary policy instruments [12]. Therefore, the existence of a relationship between prices and various monetary policy indicators is very crucial for the adoption of inflation targeting. An important relationship in terms of stability between these two elements is one of the success key factors of the inflation targeting policy.

IV. CAN CENTRAL BANK OF TUNISIA (CBT) FOLLOW THE INFLATION TARGETING?

A. Independence of the CBT

To evaluate the independent status of the CBT, we study the clarity of its mission, the independence of the central bank of the state and the absence of the dominant financial position and of the obligation for the CBT to finance the budget deficits.

In Tunisia, the central bank governor is appointed by decree of the President of the Republic for a term of six years, renewable once or several times. The latter can also be dismissed from office by a decree. The council of the central bank is composed of the governor, the vice governor proposed by this governor and named by decree and of eight advisors named by decree on a proposal from the Prime Minister.

Ref. [13] and [7] has developed a measure of central bank autonomy, based on the average duration of the mandate of the governor. The turnover rate of central bank governors is an indicator that reflects the independence of central bank. The weakest rate reflects the highest independence central bank. According to [14], the measure of the TOR (turnover rate of central bank governors) of the CBT takes a value of 0.40 which is a little raised by comparing it with main partner and rival countries.

TABLE I. MEASURES OF TOR IN SOME DEVELOPING COUNTRIES

Countries	*TOR measured by [14]*
Egypt	0.10
Lebanon	0.10
Morocco	0.20
Kuwait	0.20
Saudi Arabia	0.20
Turkey	0.30
Iran	0.30
Jordan	0.30
Algeria	0.30
Libya	0.30
Tunisia	0.40

Source: [14]

The amendment of the organic law establishing the CBT has reinforced its independence. According to the second Article of the Law n° 2006-26 of 15 May 2006, the CBT is defined as a national public institution with financial autonomy. Already [15] examined the real independence of the CBT and showed that the rate became equal to 0.2.

Although CBT does not currently have considerable independence, it seems that this first property of inflation targeting is being improved.

B. Transparency of the CBT and its communication with the public

The CBT establishes statistics relating to the currency and to the balance of payments. Besides, it publishes all documents, periodicals, reports, studies and statistics with economic, monetary or banking character. Moreover, all the annual reports and the monetary indices used within the central bank are at the disposal of the public.

Although almost all of the large volume of information has been published with a delay that could reach six months, we notice that the transparency of the CBT is more evolved from 2006 (news of the central bank are displayed to the public, information are increasingly available ...).

The main mission of the CBT monetary policy consists in preserving the stability of prices which is the priority objective recommended to the central banks to be able to adopt inflation targeting strategy. In order to achieve this goal, Tunisian monetary policy rests, in addition to monetary aggregates and credit, on a on a diversified range of indicators closely linked to inflation. Indeed, the goal of CBT presents a simplicity and clarity to the public.

C. Predictive power of CBT

The Tunisian monetary authorities should be competent enough to well predict inflation because the precision in these expectations is an essential component of the inflation

targeting framework. However, according to [9], Tunisia does not yet have a consistent methodology for forecasting inflation. Even when the authors have tried to find an appropriate model for good expecting inflation in Tunisia, they were confronted with problems of a lack of relevant data (monthly import prices and retail sales) and the importance of administered prices in the basket. The presence of this big part of administered prices lose the flexibility and efficiency of monetary policy, especially in the case of inflation targeting strategy when forecasting inflation and quick reaction capacity of the bank Central to shocks are paramount.

D. Tunisian financial system development

Ref. [16] has reported that financial market in Tunisia, although it is well organized, it is shallow. This could hinder the success of inflation targeting in Tunisia.

The creation of Tunis Stock Exchange (TSE) is relatively recent (February 28, 1969). Thus, the TSE is not highly developed. It has only 50 companies. Besides, transactions in the Tunisian financial market are not very important.

According to [17], the liberalization of Tunisian banking system took the form of a new regulation of its behavior since the nineties. However, its competitiveness continues to be uncertain. In addition, although the Tunisian banking system is stable, its operations remain highly segmented in economic, temporal and particularly social terms.

E. Relation between inflation and monetary policy leading indicators in Tunisia

To analyze this relationship and in accordance with the methodology used by [18], [19] and more recently by [20] and [21], this study adopts the Vector Auto Regressive (VAR) methodology, the Granger causality tests and the variance decomposition.

In the base model, the vector of endogenous variables is constituted by gross domestic product (GDP), consumer price index (CPI), M2 money supply (M), fiscal spending (FS), interest rate (R) and exchange rate (E).

$$Yt = (GDP, CPI, M, FS, R, E)$$

The analysis of the relationship between inflation and monetary policy leading indicators in Tunisia is based on annual data between 1970 and 2009. This database is obtained from the international financial statistics, the national institute of statistics and the institute of quantitative studies. All variables used are a first difference stationary.

In this study, the dynamic relationships between inflation, output, currency, interest rate and exchange rate were evaluated using the VECM (Vector Error Correction Model) because the co integration tests showed the presence of a co integration relation. Using variables in logarithms except interest rates, our model presents two delays by resorting to Akaike Information Criteria and to Sequential modified LR test statistic. We will explore the existence of a stable relationship between inflation and monetary policy leading indicators, which is a prerequisite for the success of the inflation targeting adoption exposed in several empirical studies.

The analysis of causal relationships between macroeconomic variables provides a better approximation of monetary phenomena. Furthermore, it presents additional elements on the anteriority of the events between them and simplifies the control of an optimal monetary policy.

a. Granger causality tests

The causality analyses make us know the statistically significant influences between the six endogenous variables. The analysis of this causality is a necessary condition to study the model dynamics. Table II presents the results of Granger causality tests. If the probability is greater than 5%, we accept the null hypothesis of no causality.

According to the results, the fiscal spending causes significantly the CPI variations. The fiscal spending is important for forecasting prices rise. Moreover, the Granger causality results show that the interest rate has a strongly significant effect on the price level. The knowledge of the last and present values of interest market rate makes predict the future values of the CPI. GDP, exchange rate (TND / USD) and the money supply can't be good leading indicators for predicting inflation. They have indirect effects on the CPI since they have significant effects on interest rates and fiscal spending. This means that the relationship between inflation and the instruments of monetary policy is not very strong and predictable.

TABLE II. GRANGER CAUSALITY TESTS

Null hypothesis	***Probability***
DGDP does not Granger cause DCPI	0.2522
D GDP does not Granger cause DM	0.2230
D GDP does not Granger cause DFS	0.2085
D GDP does not Granger cause DR	0.0051*
D GDP does not Granger cause DE	0.7707
DM does not Granger cause DCPI	0.2772
DFS does not Granger cause DCPI	0.0034*
DR does not Granger cause DCPI	0.0088*
DE does not Granger cause DCPI	0.3381
DM does not Granger cause DFS	0.0376*
DM does not Granger cause DR	0.0361*
DR does not Granger cause DFS	0.0270*

*reject of null hypothesis with 5% threshold

Despite the presence of a causal relationship between inflation and monetary policy leading indicators which is

direct or indirect, links between monetary policy instruments and inflation do not seem to be strong, stable and predictable. Tunisia does not seem to be ready for the adoption of the inflation targeting policy.

b. Variance decomposition

The decomposition of forecast error variances helps us to find the contributions of innovations in one variable to the prediction error covariance in forecasting of CPI. The results of the decomposition variance are presented in Table III.

TABLE III. VARIANCE DECOMPOSITION OF CPI

Period	GDP	CPI	M	FS	R	E
1	5.105	94.894	0.000	0.000	0.000	0.000
2	2.030	91.405	0.175	4.656	1.651	0.079
3	1.918	93.974	0.064	2.086	1.796	0.159
4	1.046	95.300	0.033	1.338	1.813	0.468
5	0.947	94.547	0.101	1.589	2.099	0.713
6	1.043	93.176	0.093	1.950	2.407	1.328
7	0.988	92.130	0.092	2.334	2.640	1.814
8	1.015	91.007	0.085	2.791	2.827	2.270
9	1.064	89.851	0.076	3.256	2.995	2.755
10	1.081	88.861	0.070	3.635	3.166	3.184

In a one-year horizon, the forecast error variance of the CPI is for 94.89% mainly due to its own innovations and for 5.1% of GDP. A shock on money supply, fiscal spending, interest rate and exchange rate does not explain the variance of inflation measured by the CPI. Nevertheless, in the next two years, a shock on fiscal spending explains for 4.65% of the CPI and another on the interest rate explains it for 1.65%.

However, at one-year horizon to 10 years, a shock on GDP explains less than 5.2% of the CPI. In the long run, a 10-year horizon, the forecast error variance of the CPI is explained by a significant percentage of its own innovations (88.86%) as against less than 3.63% of the fiscal spending, 1.08% of GDP, 3.18% of exchange rate, 3.16% of interest rate and only 0.07% of the M2 money supply.

We note that the CPI is explained on a horizon of 1 to 10 years mainly by its own innovations. Therefore, the relation between inflation and monetary policy leading indicators is not very strong and predictable.

V. CONCLUSION

The characteristics of inflation targeting require that the monetary authorities of the country have technical and institutional capacity for modeling and forecasting inflation and that the determinants of prices rise have a predictable effect on the inflation rate.

Within the monetary policy framework, the CBT is not yet ready to adopt the inflation targeting strategy in the short-term. The move to an inflation targeting policy still requires some preparation on the part of the CBT. The strengthening of its monetary policy may facilitate the adoption of inflation targeting. Therefore, transparency of monetary policy should be developed. Data should be more detailed and relevant.

In order to formulate an appropriate monetary policy in the inflation targeting context, it is essential for Tunisia to evaluate the inflation direction. So, leading indicators can provide a useful statistical synthesis. The lack of advanced studies with econometric models allowing a reliable analysis of the relationship between inflation and other macroeconomic variables, cause the lack of good inflation forecasts.

The CBT should strengthen and extend its ability to accurately analyze and forecast inflation and other relevant macroeconomic variables. The importance of administered prices is a major obstacle for the implementation of an effective inflation targeting policy. Transparency must be present in the implementation of monetary policy, and that, by explaining policies pursued and decisions of the central bank to the public.

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