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Asymmetric central bank preferences and inflation rate in Tunisia

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ABSTRACT: This article fits into the new strand of literature related to the asymmetric central bank preferences and its effect on the inflation dynamic. In reality, the central banker preferences are more likely to be asymmetric. Central banker can be, for various reasons, more averse toward deviations from target with one sign more than deviations from target with the other sign. The interaction of asymmetric central bank preferences with uncertainty arising from the volatility of inflation and output may affect the inflation movements. This paper aims to check the hypothesis that asymmetric central bank preferences are able to explain inflation rate for the case of Tunisia and to understand Central Bank of Tunisia preferences toward inflation rate and output during the period ranging from 1993 to 2010. We refer to a standard monetary model that includes asymmetric loss function and a linear supply curve which acts as a constraint on the central bank behavior. The results show that the inflation rate depends on the output gap and on the conditional variance of inflation and provide evidence for asymmetric central bank preferences. The Central Bank of Tunisia seems to be more averse to high inflation which is consistent with its ultimate goal explicitly announced to preserve price stability.

KEYWORDS: Monetary policy, asymmetric loss function, conditional variance, inflation, Tunisia.

1 INTRODUCTION

Literature pays particular attention to the way in which monetary policy is conducted. Central bank reactions are designed to control inflation and ensure price stability but they can also affect real activity in the short term. Consequently, central banks play a crucial role to hedge the economy from a high economic growth and/or a more inflation rate thereafter they are likely to embody output stability among their goals in addition to price stabilization. Nonetheless, central banks do not always explicitly reveal their goals. This complicates the task of economists focused on explaining macroeconomic fluctuations. The inflation bias of the 1970s is explained by the time inconsistent monetary policy adopted by the authorities who seek to conduct the actual production to a higher level than natural [1]. Moreover, the so-called reaction function proposed by [2] provided an easier understanding of the changes in economic variables in relation to the central bank responses. Recently, the monetary economists have focused on the analysis of the central bank preferences to understand the movements of output and inflation rate. All the previous research has used quadratic loss functions to index central bank preferences assumed to be symmetric.

Since the late nineties, a new paradigm of research has emerged related to the asymmetry of the central bank preferences. Practitioners often do not promote the use of a quadratic loss function for the central bank and suggest that symmetry of the quadratic form around the origin is not realistic as it implies that central bankers put equal weights on from positive and negative deviations of the inflation or the output from their target. In reality, it is more likely that policymakers approve a greater aversion toward expansion than recession [3] or to be more averse toward inflation than deflation. For that reason, a recent promising trend of research has emphasized asymmetric loss function to formulate the monetary authorities' objectives. The main feature of the asymmetric loss function is that it has a place for uncertainties affect the real and the nominal terms in the economy. When uncertainty about the future state of the economy is with the asymmetry of preferences, the inflation rate would depend on the variance of inflation and output. Thus, the additional volatility of inflation, for example, increases the probability of occurrence of a high inflationary period. Being

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averse to high inflation, the central bank adopts a restrictive monetary policy to guard the high inflationary pressure. preferences push the economy to lower inflation rate generating a deflationary bias [4].

This kind of preferences allows to understand the priority of the central bank and to determine whether the preferences are consistent with the announced policies of the central bank. Most of the empirical studies of this topic were conducted to developed countries. Tunisian seems to be an appropriate case to checking this new paradigm. In fact, Tunisia is a small open economy where the central bank is subject to internal and external pressures that are likely to induce asymmetric preferences. Since the adoption of the structural adjustment plan advocated by the IMF, the CBT aimed to maintain the value of the dinar through respect of a constant real effective exchange rate rule and controlling inflation rate near that of the partner countries. In 2006, it is explicitly assigned the objective of maintaining price stability and begins to study the perspective of adopting the inflation targeting policy, which requires a certain degree of central bank credibility. We believe that such conditions may affect central bank preferences and the conduct of the monetary policy.

The present paper aims at checking the assumption of asymmetric preferences for the CBT and to verify if this hypothesis is able to explain inflation movements in Tunisia. We present a model in which central bank minimizes an asymmetric central banker's loss function of inflation and output subject to a linear economic structure which acts as constraints on the central bank behavior. The optimal derived inflation function depends on the output gap and the conditional variance of inflation and output.

The paper proceeds as follows: Section 2 presents a literature review. Section 3 introduces a brief description of the monetary policy in Tunisia. Section 4 derives the model which describes the optimal inflation function. Section 5 illustrates the empirical results and section 6 concludes.

2 LITERATURE REVIEW

2.1 CENTRAL BANK PREFERENCES MODELING

The use of the quadratic loss function to characterize the preferences of the policymakers has inaugurated an objective and uniform treatment of the question of optimality. Due to the feasibility introduced by this function in dynamic it has been commonly used to derive the optimal reaction function of the central bank under the main assumption of symmetric preferences. This function displays the quadratic losses generated in the deviations of inflation and output their respective targets. Losses will be higher when the deviation is greater. This means that shocks considered too are penalized more severely than small shocks. Therefore, what is important in a quadratic loss function is essentially the of the deviation and not its sign. In fact, a major criticism of this function is related to its symmetric aspect which means the same weights are given to positive and negative deviations from the target variables. For instance, the loss the authority would have with inflation one percentage point above the target would be the same as the one resulting from inflation one percentage point below the target. However, there are several reasons for which the central bank may adopt asymmetric preferences. The first is psychological. It argues that the individual would often exhibit greater aversion to than to gain (prospect theory [5]). The second reason is political. Thus, a little independent central bank may be under pressure of political authorities during elections, which push it to be more averse towards recessions [6]. In addition, to credibility with private agents, the central bank might be more averse toward inflation levels that exceed the target [7]. second weakness of the quadratic loss function is related to the fact that it adopts the principal of certainty equivalence neglecting uncertainty related to the objective variable fluctuations and to the future state of the economy. This principal implies that the central bank is able to control perfectly the shock to the economy and there is no need for the gradual and prudent behavior. Ref. [8] identifies two sources of uncertainty that the central bank faces. The first is related to the state the economy when the monetary policy decision should be adopted, as well as the state of the economy when this will affect economic activity. The second source of uncertainty is that the central banker does not know with precision the magnitude of the variable response on which it wishes to have an effect, nor the delays in transmission. It argues that such uncertainties the central bank should be more cautious and gradual in the conduct of monetary policy. Ref. [9] argues that uncertainty is the defining aspect of the monetary policy landscape. As a result, choosing policy options is a process requires an understanding of the sources of risk and uncertainty that policymakers face and quantifying those risks when possible. For all these reasons, an asymmetric loss function seems more appropriate to describe the asymmetric of the central bank and to overcome these deficiencies. Ref. [10] says that economists tend to use quadratic loss function reason of mathematical convenience and they would benefit from more serious thinking about the functional form of the loss function. Ref. [11] introduced the additive and multiplicative uncertainty in a non-quadratic loss function and find that the optimal rule depends on the additive variability and the degree of asymmetry in Policymakers preferences. Recent theoretical studies highlight that asymmetric preferences give no way to the principal of certainty equivalence and permit the volatility of objective variables (inflation and production) to influence the equilibrium inflation rate. This new

starts from the central bank's asymmetric preferences and use the structure of the economy as a constraint. As a result, it opens a room for the effect of uncertainties on the economy. Ref. [3] shows that the presence of a great aversion towards negative output gaps coupled with uncertainty about the future state of the economy led the central bank to create a monetary expansion when the probability of a future recession is greater generating consequently an inflation bias. Ref. and [12] used a Linex (linear-exponential) loss function and argued that as central banks are more averse to the positive deviation of inflation from target, the uncertainty associated with high inflation volatility is likely to raise the expected marginal cost and induce a prudent behavior on the part of central bankers. This caution is more than enough to deliver an average inflation rate lower than the target. Ref. [13] contributed to this literature and derive an optimal inflation function which includes the conditional variance of inflation and output gap to explain the inflation dynamic.

2.2 EMPIRICAL EVIDENCE

Due to the realism of the asymmetric central bank preferences hypothesis, several empirical studies have tried to verify it. There exists formal empirical work on monetary policy reaction functions supporting this key feature of recent literature. Ref. [14] estimated the asymmetric preferences of the Federal Reserve of United States (Fed) and reported her aversion toward the positive deviation of inflation during the Volcker-Greenspan period. Ref. [15] adds that the asymmetry of the reaction of the Fed is mainly due to the fact that the Fed places a larger emphasis on losses from output expansion than on those from output contraction in the pre-Volcker era. Ref. [16] shows that the European central bank reveals a greater aversion toward the high level of inflation.

The other trend of research which explicitly examined the relationship between asymmetric central bank preferences and inflation outcomes appears also to provide a solid support to this hypothesis interacting with changes in the volatility of shocks to inflation and/or unemployment. Ref. [4] estimated an optimal inflation function for three inflation targeting countries, namely Canada, Sweden and the UK. He found that the central bank preferences are capable to justify inflation rate which has been below the target since preferences are asymmetric in favor of the lower inflation rate. Ref. [17] examines the US inflation dynamic and concludes that it is best explained by the model assuming that the Fed evaluates positive unemployment deviations more severely than negative ones. Ref. [18] uses data from G7 countries, and finds a positive relationship between inflation rate and the conditional variance of unemployment rate (asymmetric relation) for the USA and France. However, the hypothesis of symmetric relationship in the UK, Canada and Italy cannot be rejected. Ref. [13] seeks the merit of the asymmetric preferences model to describe the behavior of inflation in the U.S. during the period 1960-2005. He found evidence of asymmetry in the loss associated with the output gap for the pre-Volker era in which the Fed was far more concerned with negative than with positive output deviations. Ref. [19] finds a support to the hypothesis of asymmetric preferences for a developing country. His results show that the central bank of Jordan grants more interest to negative deviations of inflation from the target and exhibits a greater aversion to recession than to boom. Recently, [20] resorted to the cointegration procedure to verify whether volatilities of inflation rate and unemployment are key determinants of the inflation rate using data from 13 OECD countries. Their results do not support this relationship between the behavior of the inflation and the volatility of the objective variables which means the central bank preferences are symmetric.

3 TUNISIAN MONETARY POLICY

Monetary policy in Tunisia has experienced since the adoption of the structural adjustment plan recommended by the International Monetary Fund in 1986, too profound mutations that have changed the strategy, objectives and means of action of the Central Bank of Tunisia (CBT). Since 1987, monetary policy was the ultimate goal of preserving the value of currency by controlling the rate of inflation to a level close to that observed in the partner countries. To achieve this goal CBT chooses to control the money supply by maintaining a growth rate of monetary aggregate M2 (then M3) compatible with the economic activity in order to avoid inflationary pressure with monetary character. Controlling inflation may some of the pressure on the dinar and ensure greater stability of its value. A rule of constant real effective exchange rate also considered by the CBT to guard against strong fluctuation of real exchange rate which may threaten the of Tunisian firms and interests of foreign investors. Since 2000, monetary policy has crossed a significant qualitative leap giving it a more dynamic, flexible and efficient character while continuing process of liberalization. Indeed, a new program restructuring and modernization of the banking system was envisaged to improve its financial strength and efficiency. Similarly, additional efforts to diversify monetary policy instruments and modes of intervention of the central bank have been deployed. In 2006, it was assigned explicitly the primary objective of maintaining price stability based on the interest rate as the main instrument of monetary policy establishing thereby the institutional framework of the inflation targeting policy. To achieve its objective the CBT is based on a wide range of indicators closely linked to inflation such as import

the output gap, core inflation, etc. From 2007, the Central Bank began to study the opportunity of adopting the inflation targeting policy and serious attempts are being implemented in order to establish a device for analyzing and forecasting inflation. In this context the central bank should give priority to strengthening its credibility in order to anchor private expectations [21]. This can obliged the CBT to adopt asymmetric preferences toward inflation fluctuations. It may be more averse to positive deviations of inflation than negative ones. Moreover, although the CBT has some legal independence in terms of objectives established in 2006, it remains dependent to the political authorities who must be informed of any fact likely to threaten the desired stability. Secondly, the procedures for appointing the members of the central bank board exhibit a strong dependence on the government: four of its members are officers of the government the governor is appointed by a decree from the President of the Republic. Ref. [22] computes a turnover rate of governor equal to 0.2. It is therefore clear that the CBT can be subject to the pressures of political power especially in election during which the goal of economic growth is the most privileged at least until the end of 2010. As [6] argued its can be reversed to be more averse to recessions in order to serve interests of political authorities. To verify our intuitions to understand the main aspects of the CBT preferences, we exploit the assumption of the recent paradigm which provides relationship between the asymmetry of preferences, the volatility of the objective variables and the rate of inflation.

4 THE MODEL

All studies mentioned above show that there is a vast literature for asymmetric loss functions. This function earns more importance since it is more realistic and highlights the role of uncertainty that surrounds all decision-making processes so it can provide a reasonable explanation of the inflation dynamic. Most of empirical studies have focused on samples of developed countries for that we intend to extend them to the case of a developing country like Tunisia. Tunisia is a small open economy which is vulnerable to various external shocks due to either economic or political events. This vulnerability can raise the degree of macroeconomic variable volatility and enhance the degree of uncertainty. Moreover, the new requirements of modern monetary policy and internal pressures that CBT is subject to, makes it more likely that CBT approves asymmetric preferences. We believe Tunisia is a perfect case to test whether central bank's preferences are asymmetric and to what extent this hypothesis is able to clarify inflation rate behavior. Therefore, in this part of the study, we rely on a macroeconomic model to test this paradigm and to learn more about CBT preferences. The model is similar to that built by [19]. It is a standard monetary model which consists of a central bank's loss function and an economic structure operating as a constraint on the central bank's behavior, and as follows:

4.1 THE ECONOMY

The model begins with an expectation augmented short run Phillips curve, which ties deviations of production to its natural level to unexpected inflation and exogenous shocks:

$$y_t = y_n + k\,(\pi_t - \pi_t^e) + s_t \qquad (1)$$

Where "y_t" is the real output, "y_n" denotes the natural rate of output, "π_t" stands for the actual inflation rate, "π_t^e" is level of expected inflation rate by the private sector. "k" denotes the elasticity of output with respect to price level. "s_t" is aggregate supply shock, and assumed to be normally distributed, st $\sim N(0, \sigma^2)$. Private agents have rational expectation they anticipate the inflation rate conditional on all the available information.

4.2 THE CENTRAL BANK

We assume the central bank's preferences are asymmetric in inflation rate and output.

The loss function is Linex. It can be written as follows:

$$L = \frac{\exp\left(\alpha\,(\pi_t - \pi_t^*)\right) - \alpha\,(\pi_t - \pi_t^*) - 1}{\alpha^2} + \frac{\exp\left(\emptyset(y_t - y_t^*)\right) - \emptyset(y_t - y_t^*) - 1}{\emptyset^2} \qquad (2)$$

Where π_t represents the actual inflation rate, π_t^* and y* are the target level of inflation and output, respectively. "α" measures the degree of asymmetric preferences of inflation rate. A positive value of α ($\alpha > 0$) means that positive of inflation are considered by the central bank more costly than negative. Thus, a rate of inflation exceeding the target ($\pi_t > \pi_t^*$) makes the exponential term dominant and loss associated with this positive deviation increases exponentially resulting in a greater loss. On the contrary, If ($\alpha < 0$), the central bank is more averse to the negative side of the deviation than to the positive side. The loss of the central bank increases exponentially when the inflation rate is below the rate of inflation target, but it enhances linearly when the inflation rate exceeds the target. $\emptyset$ illustrates the degree of asymmetric

preferences of output. Analogously, if $\emptyset > 0$, the central bank dislikes high output level more than he dislikes low output when $\emptyset < 0$, the inverse is true. The central bank is more averse to negative deviation than to positive one.

The sequence of events according to which optimal policy choice is determined, is set within a framework of strategic games between central bank and private agents. Firstly, private agents will form their expectations about the rate of inflation for the moment "t" which serve as a basis to their wage negotiations and will therefore be incorporated into nominal contracts. Secondly, taking these expectations as given, the central bank chooses the value of the inflation rate target before the realization of the shocks. To determine the optimal inflation rate, central banker minimizes the asymmetric loss function subject to the constraints given by (1), and then it conducts monetary policy. Finally, the real stochastic shocks of both demand and supply are realized. The most important here, is the fact that when it establishes its monetary policy, the central bank is uncertain about the importance of shocks reaching employment and production. It doesn't have perfect information about the shocks to the economy. After the shock, the central bank takes this new information set and tries to adapt its policy in the next phase of events.

4.3 SOLVING THE MODEL

We assume that the central bank cannot commit credibly for more than one period. Therefore, each period, after the private agents have formed their expectation but before the realization of the shocks, the central banker should choose its inflation target (π_t^*). It seeks to compute the expected (optimum) inflation rate by minimizing its loss, which is assumed to a function of the deviation of inflation from its target, and of the output gap, subject to the information available in the economy, as follows:

$$\text{Min } E\{L(\pi_t - \pi_t^*, y_t - y_t^*)/\Omega_t\} \qquad (3)$$

Substituting equation (2) into equation (3) we obtain:

$$E_{CB}L = E_{CB}\left(\frac{\exp(\alpha(\pi_t-\pi^*))-\alpha(\pi_t-\pi^*)-1}{\alpha^2} + \frac{\exp\left(\theta(y_t-y^*)\right)-\theta(y_t-y^*)-1}{\theta^2}\right) \qquad (4)$$

$\alpha \neq 0$ et $\theta \neq 0$, E_{CB} stands the expectations of the central bank which are assumed to be as follow $E_{CB}(y^N) = y^N$, $E_{CB}(y^*) = y^*$, $E_{CB}(\pi^*) = \pi^*$, $E_{CB}(st) = 0$

The value of the exponential term is determined by reference to the moment generating function [23], and substituting $y^* = \rho\, y^N$ yields:

$$E_{CB}L = E_{CB}\left(\frac{\exp(\alpha(\pi_t-\pi^*))-\frac{\alpha^2\sigma^2_{\pi,t}}{2}-\alpha(\pi_t-\pi^*)-1}{\alpha^2} + \frac{\exp\left(\theta(y_t-\rho y^N)\right)-\frac{\theta^2\sigma^2_{y,t}}{2}-\theta(y_t-\rho y^N)-1}{\theta^2}\right) \qquad (5)$$

Substituting equation (1) into equation (5) and derive for π_t, then use Ln (e^X) =X, and approximation of Ln ((A - A e^X) + 1)= AX, gives:

$$\pi_t = \pi^* - k\left(y_t - \rho y^N\right) - \left(\frac{\alpha\,\sigma^2_{\pi,t}}{2}\right) - \left(\frac{k\theta\sigma^2_{y,t}}{2}\right) \qquad (6)$$

To simplify the model, we assume the central bank is targeting the natural level of output ($\rho = 1$). The final shape of model is as follows:

$$\pi_t = \pi^* - k\left(y_t - y^N\right) - \left(\frac{\alpha\,\sigma^2_{\pi,t}}{2}\right) - \left(\frac{k\theta\sigma^2_{y,t}}{2}\right) \qquad (7)$$

Where $\sigma^2_{\pi,t}$ is the conditional variance of inflation rate, $\sigma^2_{y,t}$ is the conditional variance of output. Equation (7) the sensitivity of inflation to the output gap, the conditional variance of inflation and the conditional variance of output. intuition is that in presence of asymmetry in the central banker's preferences towards inflation, an increase in the inflation affects the conduct of monetary policy and, consequently, the inflation rate's dynamic. Insofar as the central dislikes high inflation more than they dislike low inflation (i.e. $\alpha > 0$), an increase in the variance of inflation leads policymakers to reduce the average inflation in order to insure against high inflation shocks.

5 EMPIRICAL ESTIMATION

In this empirical section, we focus on estimating the inflation function (7) presented above. Our goal is to checking the relationship predicted by the theoretical model between inflation and asymmetric central bank preferences. In other we seek to examine if the asymmetric central bank's loss function helps to explain the inflation dynamic in Tunisia.

we seek to provide a better understanding of the preferences of the CBT trying to provide evidence that support the statement of asymmetric preferences from a developing country like Tunisia. The estimation is carried out using quarterly data for the Tunisian economy during the period 1993 :1-2010: 1. Inflation and output gap were determined from the of consumer prices index and industrial production index (base 2000), respectively. These data were collected from the National Institute of Statistics. The following equation can serve as a basis for empirical work

$$\pi_t = \pi^* - a_1 \left(y_t - y^N\right) - a_2 \sigma^2_{\pi,t} - a_3 \sigma^2_{y,t} + \varepsilon_t \qquad (8)$$

Where ε_t is an error term and

$$a_1 = -k$$

$$a_2 = -\left(\frac{\alpha}{2}\right)$$

$$a_3 = -\left(\frac{k\emptyset}{2}\right)$$

At this stage, we need to relate the signs of the estimated coefficients to the underlying parameters mainly those relative to the asymmetries in the loss function.

Since the parameter k is positive by assumption, a negative estimate of a_1 means that the central bank responds to a positive output gap by adopting a restrictive monetary policy. Similarly, if the sign of a_2 is negative, the preference (α) must necessarily be positive. This corresponds to the realistic intuition that the central bank dislikes high inflation than low inflation. The same reasoning can be applied for a_3, according to which a negative sign refers to conclude that central bank is more averse to expansion than to recession.

The model predicts that the conditional variance of inflation and output helps explain the inflation rate. However, this prediction can only be examined in a time series framework if these two variables are conditionally heteroskedastic. That if $\sigma^2_{\pi,t}$ and $\sigma^2_{y,t}$ change over time. Otherwise, if these variances are constant, their coefficients are not being identified. before proceeding further, it is important to test whether the conditional variance of inflation and output is indeed time varying. Lagrange Multiplier (LM) test statistics for neglected ARCH were calculated as the product of the number of observations and the uncentered R2 of the OLS regression of the squared inflation and output residual on a constant and to three of its lags. Under the null hypothesis of no conditional heteroskedasticity, this statistic is distributed chi-square as many degrees of freedom as the number of lagged squared residuals included in the regression. If any of the p-values associated with the test was less than or equal to 10-percent, we took this as evidence of possible conditional heteroskedasticity. In our case, we find evidence of time varying conditional heteroskedasticity for the inflation variable, we can't detect the existence of an ARCH effect in the output volatility. The results are represented in Table1.

Table 1. LM-ARCH Test for presence of heteroskedasticity

Test	Inflation	Production
AR(1)	0.0022	0.40
AR(2)	0.0081	0.276
AR(3)	0.0217	0.139

Thus, we opt to estimate only the conditional variance of inflation by using the Garch (1,1) process. Figure 1. displays the estimated conditional variance of inflation rate of the Tunisian economy.

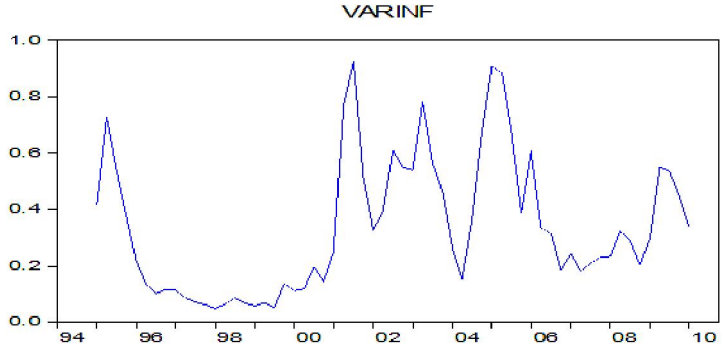

Fig. 1. Conditional variance of inflation

In a second step, we checked the stationarity of all variables included in the model: the inflation rate, output gap and the conditional variance of inflation rate. Two unit root tests were operated which they are: Augmented Dickey-Fuller test and Phillips-Perron test. These tests confirm that all the four series are stationary on level.

We proceeded to estimate firstly equation (8) utilizing ordinary least squares method but the results show a serious problem of serial autocorrelation. For that, we choose a distributed lag model with the optimal lags are determined using the Correlogram-Q Statistics and the AIC criterion to perform this task. We derive that the best lags which fit the model are 3 time-lag. The distributed lag model is as follows:

$$\pi_t = \pi^* - \sum_{j=0}^{3} a_{1j}\left(y_t - y^N\right)_{t-j} - \sum_{j=0}^{3} a_{2j}\ \sigma^2_{\pi,t-j} + \varepsilon_t \quad (9)$$

Table 2 presents the results of the estimation operated with ordinary least squares method. In general, the results of estimation show that the estimated coefficients of the model have the expected signs. The coefficient a_{11} has a negative and is significantly different from zero indicating that the central bank responds to an increase of the output gap by a restrictive monetary policy which reduced the inflation rate down. Regarding the coefficient inherent in the conditional variance of inflation, a_{20} is significant and negative implying that the preference parameter is positive ($\alpha > 0$). This sign reflects that the Tunisian central banker dislikes the positive deviations of inflation more than the negative one. Thus, being more averse to high inflation, the increase in inflation volatility associated with a high probability of an inflationary period led the central bank to opt for an overly restrictive monetary policy to reduce the inflation at a level below the value (estimated at 3.41%) and insure against highly inflationary shocks. It appears that this aversion toward too high inflation can lead to low inflation rate during periods registering high volatility. On the other hand, no information has deduced about the CBT preferences toward the output deviations due to the absence of any Arch effect in the industrial production index. This can be the main limitation of this approach which will only detect asymmetric monetary policy in case where there are variations in target variables volatility over time. To sum, the output gap fluctuations and the conditional variance of inflation appear to have a significant effect on the inflation dynamic in Tunisia. We can conclude the volatility of the principal central bank's objective variable which is the inflation rate helps to explain Tunisian inflation dynamic.

Table 2. Estimation results

Variables	Coefficient	Standard Error	Prob
π^*	3.418268	0.281994	0.00
Gap	0.011347	0.050788	0.8241
Gap(-1)	-0.103624	-2.037711	0.0466
Gap(-2)	-0.000628	0.053126	0.9906
Gap(-3)	-0.006708	0.045635	0.8837
σ^2_{π}	-2.973591	0.997366	0.0045
$\sigma^2_{\pi(t-1)}$	0.639953	1.455187	0.6620
$\sigma^2_{\pi(t-2)}$	0.856621	1.425835	0.5508
$\sigma^2_{\pi(t-3)}$	1.014156	0.976288	0.3040
R^2	0.30		
F-statistic	2.65		(0.01)

We believe that the results inferred from this study are consistent with the real objectives of Tunisian monetary Authorities. The CBT was assigned in 2006 the ultimate goal of price stability. It implements all the instruments at its disposal to achieve this goal. Prudent conduct of monetary policy is made through the use of various intervention techniques which are complementary to ensure the effectiveness of its response. It implements the open market technique to absorb or inject the central bank money with respect to the money market liquidity in order to prevent inflationary pressures with monetary aspect. It also adjusts its tender rate (TAO) whenever it expects a sharp rise or down in inflation. Similarly, the CBT tries to contain excess liquidity by using the reserve requirements procedure. It revises upwards the reserve requirement ratio to control money creation and credit volume. In this way, Tunisian monetary authorities have succeeded in certain measures to achieve the best results in terms of inflation and allocation of adequate funding on the basis of administered interest rates and as required by the money market. A strict control of inflation may reduce some pressures on the dinar and ensure a better stability of the real exchange rate which can reinforce the competitiveness of Tunisian firm and helps preserve the interest of foreign investors.

The ambition of the CBT to achieve a low level of inflation corroborates our result stipulating asymmetric preferences the CBT which dislikes high inflation more than low inflation. Tunisian authorities want to maintain inflation close to that partner countries mainly Europe. Thus, the government has set a target for the price level equal to 3% in the tenth development plan. This target value is near to the value of the inflation target inferred from the estimated model ($\pi^* = 3.41\%$).

6 CONCLUSION

Recently, the symmetric aspect of central bank preferences has been questioned, and a new line of literature has emerged which is closer to the real attitude of the central banker. This new strand of research advocates asymmetric preferences of the central bank and believes that such preferences can explain inflation behavior. This paper deals with the case of Tunisia seeming to be an appropriate case given that the CBT's preferences are more likely to be asymmetric. The CBT is anxious to ensure its credibility and operates in an environment of high uncertainty issue not only from the opening to the outside and the liberalization context but also on the internal functioning of the economy. The contribution of this paper is twofold. First, it allows to extent previous empirical studies to a developing country like Tunisia helping to understand movements of inflation rate in such a small open economy. Second, it can provide better clarifications on the CBT's preferences surrounded by high opacity due to the lack of transparency on the part of the CBT, which often do not disclose its own preferences.

The results presented in this paper, based on quarterly data from the Tunisian economy, support the view that the interference of asymmetric central bank preferences and uncertainty issuing from macroeconomic volatility can explain inflation dynamic. The data gives also evidence for asymmetric CBT's preferences of inflation rate. Tunisian central banker is more averse to high than to low inflation. Consequently, an increase in the volatility of inflation induces a prudent behavior of the central banker which conducts a restrictive monetary policy. Moreover, Tunisian monetary authorities seem to react to an increase in the output gap by a restrictive monetary policy to avoid a boom capable of generating strong inflationary pressures. In sum, the results seem to be consistent with the CBT announced objectives and policies which aim to maintain price stability and to provide a best control of inflation.

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