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Exploration of sources of Tunisian inflation rate fluctuations

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Abstract

By using a Structural Vector Autoregression model, we study the effects of terms of trade, supply, fiscal, balance of payments and monetary shocks on the Tunisian quarterly inflation rate for the period 1987:Q3 to 2012:Q4. Empirical results highlight the dominance of monetary shocks. Supply shocks significantly affect the inflation rate while terms of trade, budget deficits and balance of payments shocks have a little contribution. Such results may be useful when deciding to manage Tunisian inflation rate.

Keywords: Inflation, SVAR model, Tunisian economy.

JEL Classification: C32, E52.

Introduction

Defined as the sustained increases in the general price level for goods and services in an economy, inflation is often blamed for major distortions that it is created in the economy. However, it is argued that low inflation or zero inflation rates inhibits or affect negatively the economic growth. Thus, a study of the determinants of inflation is necessary for economic policy makers to reconcile the objectives of price stability and sustainable economic growth.

Inflation has been usually a subject to debate among economists. Two major schools of thought have dominated the economic literature: the monetarism and the structuralism. Today, the explanation of inflation rate fluctuations as a result of either supply or demand shocks is insufficient in understanding persistence and movements of inflation in both developed and developing countries. According to Ball (1993), for developing economies, one could encounter "a dizzying array of phenomena" including budget deficits, supply shocks, external debt, exchange rate crises, incomes policies, the choice of nominal anchors, the frequency of price adjustment and inflation inertia, real wage behavior, real interest rates and bankruptcies, and distributional conflicts. Using a structural vector autoregression model, Kibritcioglu (2004) find common explanation of high and persistent inflation in Turkey from 1980 to 2002 which include: high public sector budget deficits, monetization of public sector budget deficits, persistent inflationary expectations of economic agents, exchange rates changes, occasional increases in world prices of major imported inputs, etc. Prakash and Phillip (2001) found that the most important sources of inflation in a panel of developing countries are the inertial component with some differences across regions corresponding to differences in the exchange rate regime. Catao and Terrones (2005) show a strong positive association between deficits and inflation among high-inflation and developing country groups, but not among low-inflation advanced economies.

Like many developing countries, Tunisia was marked by high and persistent inflation rate for many decades. For the past three decades, there has been a growing interest toward achieving a lower inflation rate to promote economic growth and price stability. The objective nowadays is to target for inflation in Tunisia to keep it in check and to avoid the risk of inflation increase. That is, understanding sources of inflation rates fluctuations in Tunisia are necessary for an inflation targeting success. In this line and following the work of Dibooglu and Kibritcioglu (2004), we estimate a Structural Vector Autoregression model to assess the sources of Tunisian inflation rate fluctuations.

The paper is organized as follows: section 1 presents the empirical methodology; section 2 explores the sources of Tunisian inflation rate fluctuations. Lastly, we conclude.

1.0. The empirical methodology

Since the work of Sims (1980), vector autoregression (VAR) model became a useful tool in macroeconomic analysis. The hypothesis behind VAR modeling is that the evolution of the economy can be modeled by the description of the dynamic behavior of a vector of variables linearly dependent from the past: the VAR model expresses each variable in the system as a linear function of its own lagged value and the lagged value of all variables being considered. The error terms in these regressions are the `surprise movements' in the variables, taking past values into account.

1.1. The vector autoregression model

A VAR(p) models is defined as:

$$\boldsymbol{X_t} = \varphi_0 + \varphi_1 X_{t-1} + \cdots + \varphi_p X_{t-p} + \varepsilon_t \quad (1)$$

With X_t denote a (N×1) vector of times series variables, p is the number of lags included in the system, $\varphi_0 \in R^N$, φ_i are (N×N) coefficient matrices and ε_t is a (N×1) vector of errors terms with zero mean and variance covariance matrix $\sum_\varepsilon$.

In lag operator notation and omitting any exogenous variables in the system, VAR(p) can be written as:

$$\varphi(L)X_t = \varepsilon_t$$

Where:

$$\boldsymbol{\varphi(L)} = I - \sum_{i=1}^{p} \varphi_i L^i \quad (2)$$

and I, the identity matrix.

Given that the process is stationary, the model (2) may be written in its moving average form:

$$\boldsymbol{X_t} = \varphi^{-1}(L)\varepsilon_t = \theta(L)\varepsilon_t = \sum_{j=0}^{\infty} \theta_j \varepsilon_{t-j} \quad (3)$$

Where:

$$\boldsymbol{\theta(L)} = \sum_{j\geq 0}^{\infty} \theta_j L_j$$

and $\theta_0 = I$

Under this form, εt represent the vector of the canonic innovations of the VAR process. These innovations represent the smallest component not observable of each variable that compose the VAR system. Canonic innovations are interpreted as shocks that the dynamic of the process characterize their propagation or equivalently by dynamic multipliers θj, j≥0 through them one shock is propagated to the whole process. That is, we characterize the responses of different series Xit (i=1,…,N) to different innovation εjs (s≤t) basing upon the dynamic multipliers as follow :

$$\boldsymbol{\theta}_{ij,t-s} = \frac{\partial X_{it}}{\partial \varepsilon_{js}} \quad (4)$$

The multipliers $\boldsymbol{\theta_{ij,h}}$ represent the effect of a shock j on a variable i, h periods before.

The number of parameters to be estimated in the VAR(p) model in equation (2) is respectively ((N (N +1))/2) in $\sum_\varepsilon$ and N^2p in φ. The lag length of a VAR(p) model can be determined using model selection criteria. The general approach is to fit VAR(p) models with orders p=0,…,p_{max} and to choose the value of p which minimizes the model selection criteria.

1.2. The structural vector autoregression model

To overcome the lack of theoretical subsistence in the VAR model, Sims (1980) advanced the structural vector autoregression (SVAR) model. This methodology suggests imposing restrictions on the contemporaneous structural parameters only, so that reasonable economic structures might be derived. The fact that only contemporaneous restrictions are imposed however does not imply that there is no feedback among variables. In the

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SVAR structure, the lagged values enter each equation and thus all variables are linked together.

Given that the matrix $\sum_\varepsilon$ is symmetric, we have to impose N(N-1)/2 constraints on the elements of the P matrix. Such constraints are said orthogonalization shocks. That is, to identify the N^2 elements of P, we have to impose N(N-1)/2 additional constraints to estimate the SVAR model. SVAR parameters estimation and variance decomposition analysis are performed by orthogonalizing the underlying shocks in the VAR model.
The first method, presented by Sims (1980), is the Cholesky decomposition of the variance covariance matrix of errors, which is a pre-specified ordering of the variables in the VAR that impose N(N-1)/2 additional constraints. Applying this method, the resulting variance-covariance matrix of innovations is lower diagonal such as $PP'=\sum_\varepsilon$. This approach requires the assumption that the system of equations follows a recursive structure, that is, a Wold-causal chain.

The alternative approach to achieve identification of the structural parameters is to choose the set of variables and identification restrictions that are broadly consistent with the preferred theory. The metric used to evaluate the appropriateness of the variables and restrictions is whether the behavior of the dynamic responses of the model is consistent with the preferred theoretical view of the expected response.

If the process is level stationary, short-run restriction are usually imposed to the VAR model. These restrictions imply the absence of instantaneous responses of some series to some structural impulses and therefore the nullity of a given number of coefficients in P matrix as applied by Blanchard and Watson (1986).

However, if the VAR process is non stationary in level, we can introduce long-run restrictions which express the fact that some structural impulses have no long-run effect on some variables of the system. Long-term effects are characterized by long-term dynamic multipliers defined from Wold decomposition of the first difference of the SVAR model.

1.3. Sources of inflation: a SVAR model approach

The objective of our work is to explore the sources of Tunisian inflation rate fluctuations. To this end, we estimate the SVAR model, following the work of Dibooglu and Kibritcioglu (2004). The model, applied to the Turkish economy, incorporates some important elements of a developing economy and allows macroeconomic fluctuations to arise from either internal or external shocks. It, therefore, includes five variables that are: terms of trade, r_t, real growth domestic product, y_t, budget deficits, d_t, real exchange rate, q_t, and consumer price index, p_t.

Considering the following vector:

$$\boldsymbol{X_t} = \begin{bmatrix} r_t \\ y_t \\ d_t \\ q_t \\ p_t \end{bmatrix}$$

In VAR(p) notation, each variable is explained by a structural equation that has an error term associated with it, interpreted as representing a particular innovation or shock. These shocks are labeled according to the structural equation from which they derive and are respectively: $\{\varepsilon_t^r, \varepsilon_t^s, \varepsilon_t^f, \varepsilon_t^z, \varepsilon_t^m\}$. ε_t^r is the foreign shock while ε_t^s, ε_t^f, ε_t^z and ε_t^m are the domestic shocks. ε_t^s is the supply shock, ε_t^f and ε_t^z are respectively the fiscal and the balance of payments shock namely demand shocks while we refer to ε_t^m as a nominal or monetary shocks.

In first differences, the vector X_t is covariance stationary. That is, it can be written as an infinite moving average process on the structural shocks as:

$$\Delta \boldsymbol{X_t} = \sum_{i=0}^{\infty} A_i \varepsilon_{t-i} \quad (5)$$

Where A(L) is a matrix whose elements are polynomials in the lag operator L. Denote the elements of A(L) by $a_{ij}(L)$. The time path of the effects of a shock in ε_j on variable i after k periods can be denoted $\omega_{ij}(k)$. We also adopt the notation such that A(1) is the matrix of long-run effects whose elements are denoted $a_{ij}(1)$. Each element gives the cumulative effect of a shock ε_j on a variable i over time. Similarly, A_0 is the matrix of the contemporaneous impact effects. The objective of identification is to discern the 25 elements of A_0.
Dibooglu and Kibritcioglu (2004) impose some restrictions on the long-run effects of the shocks on the endogenous variables in the SVAR model. Therefore, the vector ΔX_t is as follow:

$$\begin{bmatrix} \Delta r_t \\ \Delta y_t \\ \Delta d_t \\ \Delta q_t \\ \Delta p_t \end{bmatrix} = \begin{bmatrix} a_{11}(1) & 0 & 0 & 0 & 0 \\ a_{21}(1) & a_{22}(1) & 0 & 0 & 0 \\ a_{31}(1) & a_{32}(1) & a_{33}(1) & 0 & 0 \\ a_{41}(1) & a_{42}(1) & a_{43}(1) & a_{44}(1) & 0 \\ a_{51}(1) & a_{52}(1) & a_{53}(1) & a_{54}(1) & a_{55}(1) \end{bmatrix} \begin{bmatrix} \varepsilon_t^r \\ \varepsilon_t^s \\ \varepsilon_t^d \\ \varepsilon_t^z \\ \varepsilon_t^m \end{bmatrix} \quad (6)$$

The matrix of long-run effects in equation (6) is lower triangular. Given the 15 restrictions embedded in the variance covariance matrix on the elements of the A_0 matrix, an additional restriction is needed to identify the shocks. Taking in to account economic considerations, equation (6) provides 10 additional restrictions to recover the structural shocks.
Since our model represents a small open economy, there is a natural ordering of shocks. By construction, a small open economy does not have any control over the external shocks it faces in the world markets. This implies that domestic shocks do not have any impact on the external shocks (Buckle, Kim, Kirkham, McLellan and Sharma (2002) and Kose and Riezman (2000)). That is: $a_{12}=a_{13}=a_{14}=a_{15}=0$.

Therefore, it is widely accepted that real output is characterized as a unit root process. An important implication is that it can be decomposed into a permanent and a transitory component (Claus (1999)). Shapiro and Watson (1988) have used the identifying assumption that only supply shocks, such as shocks of technology, oil prices, and labor supply affect output in the long-run. Real and monetary aggregate demand shocks can affect output in the short-run and long-run movements of output and price.

Blanchard and Quah (1989) decompose output into its transitory and permanent components. They motivate their empirical analysis using a stylized macroeconomic model where output is affected both by demand and supply side disturbances, but only supply-side shocks, which they identify as productivity shocks such as shocks of technology and labor supply, have permanent effects on output. The identifying assumption does not exclude the possibility that these shocks also account for the high frequency movements in output as they would, for example, in a Real Business Cycle model. Yet, it is also does not exclude the possibility that short-run fluctuations are largely explained by aggregate demand shocks, such as shocks of money supply or shocks of the fiscal policy. It only excludes the possibility that the aggregate demand shocks permanently affect the level of output. The assumption allows the data to choose a description closer to the Keynesian view, in which fluctuations are predominantly transitory, or a description closer to the Real Business Cycle view, in which fluctuations are largely the result of permanent shocks. They find that output in U.S. is mostly driven by supply shocks. Several work find the same conclusion such as: Hogan, Johnson and Laflèche (2001); Schneider (2004) and Dibooglu and Kibritcioglu (2004). That is, we suppose that: $a_{23}=a_{24}=a_{25}=0$.

Concerning the third equation, we suppose that: $a_{34}=a_{35}=0$. According to the literature, a temporary fiscal expansion induces higher interest rates, a domestic currency appreciation and output expansion under a flexible system (flexible prices). On other hand, a permanent fiscal expansion has no effect on interest rates, induce a domestic currency appreciation but have no effect on output. That is in the long run, fiscal shock do not affect output evolution but has an effect on real exchange rate and price level (Dellas (2005)). Macroeconomic study postulates that persistent fiscal deficits are inflationary (Sargent and Wallace (1981), Akçay, Alper and Özmucur (2001)).

In the fourth equation, we suppose that: $a_{45}=0$. In fact, Lastrapes (1992) applies the Blanchard and Quah (1989) decomposition to real and nominal U.S. dollar exchange rates of five industrialized countries. They find that real shocks cause a permanent real and nominal appreciation, while nominal shocks are found to cause a permanent nominal depreciation. Clarida and Gali (1994) estimate the relative contribution of three types of shocks to four major real U.S. dollar exchange rates during the post-Bretton Woods era. They assume that one type of shock affects both the real exchange rate and output in the long-run. They interpret this shock as a supply shock. Clarida and Gali further assume that another shock only affects the real exchange rate in the long-run but not output, and they label this as a demand shock. Finally, all shocks that influence either the long-run real exchange rate or output are denoted as monetary shocks. For two countries, Germany and Japan, their structural estimates imply that monetary shocks explain a substantial amount of the variance relative to the dollar. They also find that demand shocks explain the majority of the variance in real exchange rate fluctuations, while supply shocks explain very little.

A feature of many open economy models is that purchasing power parity (PPP) applies in long-run equilibrium. Long-run PPP is an implication of these models because nominal shocks, which can be interpreted as shocks

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to money demand or supply, have no long-run effects on the real exchange rate. However, the evidence for long-run PPP is far from conclusive. Studies that use very long samples (typically, in excess of one hundred years) provide the strongest evidence for PPP, since, in very long samples, it is possible to reject the null hypothesis of a unit root in real exchange rates, consistent with PPP (Fisher and Huh (2001)). Lothian and Taylor (1996) find the same conclusion. Engel (1996) suggests that, even in very long samples, it is difficult to detect small non-stationary components in real exchange rates when there are highly persistent transitory components. There is a consensus, however, that if PPP does in fact hold, the speed of convergence of relative prices and the real exchange to PPP is extremely slow.
Overall, the results provided by the literature on identifying the source of shocks driving real and nominal exchange rates has provided mixed results. While this literature suggests that both nominal and real shocks explain both nominal and real exchange rate movements, the relative importance of nominal and real shocks varies across studies when the exchange rates examined involve major industrialized countries. With regard to developing and newly developed economies, however, although there have been relatively fewer studies, there seems to be a consensus that real exchange rates are largely driven by real shocks (Sarno and Taylor (2002)).

Lastly, several studies attempts to analyze inflation movements through structural shocks analysis. In this regard, we find the work of Dibooglu and Kibritcioglu (2004) which find that terms of trade, monetary, and balance of payments shocks figure prominently in the Turkish inflationary process.

Ball (1993) find that budget deficits, supply shocks are determinant factors driving inflation in developing countries. From the last equations, we conclude that that real, supply and demand shocks affect inflation in the long-run while monetary shocks has no effect or little effect on terms of trade, output, budget deficits and real exchange rate in the long-run.

2.0. Exploration of sources of Tunisian inflation rates fluctuations : a SVAR approach model

Since 1963, Tunisia was marked by high inflation rates as shown in the figure 1 .

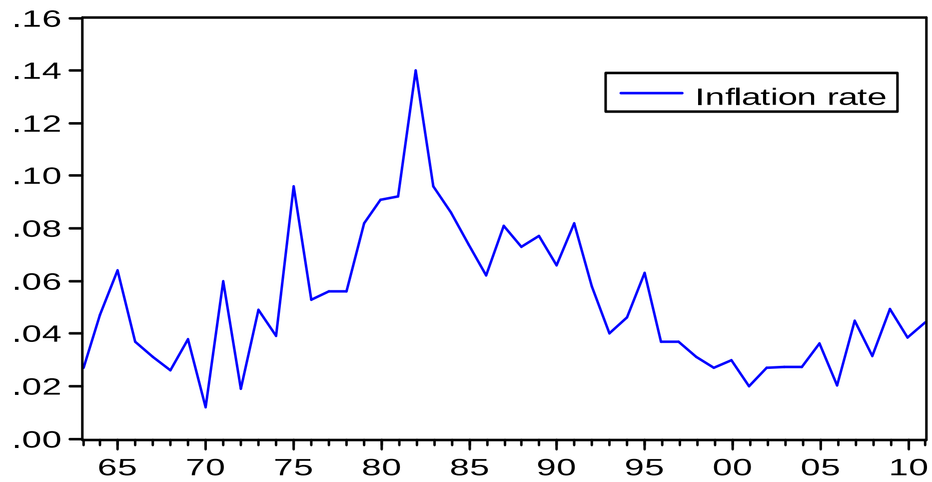

Figure 1 : Annual Tunisian inflation rate

Annual Tunisian inflation rate was about 2.7% in 1963 and 4.7% in 1964. Inflation rate oscillated between rises and drops between 1966 and 1974, reach a peak in 1975, of about 9.6%, due to the first oil shock and then came backing down until 1980 due to the second oil shock which caused a second transitory peak in inflation to recover 9.2% in 1981 and 14% in 1982. Inflation remains higher from 1983 to 1992, on average 7%. Since the mid 1995, the inflation rate was reduced to less than 4% in 2010.

In this line, our objective is to assess to what extent are the pronounced Tunisian inflation rate fluctuations due to external or domestic factors? To address this question, we adopt an empirical methodology described above. Such model is adapted to the behavior of a small open economy like Tunisia and then we use it to characterize and decompose the behavior of the inflation rate.

The form of the used model reflects the fact that Tunisia is a small and relatively open economy in which external shocks can be an important driver. Impulses response function and variance decomposition analysis are used to explore the dynamic structure of the system.

2.1. Statistical properties of the data

2.1.1. Data

The data used to estimate the model consist of quarterly and seasonally unadjusted observations that cover the period from 1987:Q3-2012:Q4. All variables considered are in logarithms. Terms of trade index (2000=100) is obtained from the National Institute of Statistics of Tunisia. Real gross domestic product (2000=100) and the budget deficits expressed in millions of dinars are obtained from the National Institute of Statistics of Tunisia and the Central Bank of Tunisia . The SDR exchange rate data and the consumer price index (2000 = 100) are retrieved from International Financial Statistics.

2.1.2. Stationarity testing

To properly specify the VAR model, variables ought to be tested for unit roots at the 5% level. ADF and KPSS tests results, given in table (1), show that all variables are nonstationary in level.

Table 1 : ADF and KPSS tests statistics

	rt	yt	dt	qt	pt
ADF statistic					
Levels	-2.970097 (0)	-1.747138 (0)	-1.718302 (0)	-3.099161 (3)	-3.264785 (5)
First differences	-11.63985 (0)	-9.281320 (0)	-8.648393 (0)	-7.333359 (1)	-1.245924 (7)
KPSS statistic					
Levels	0.252503	0.277819	0.250198	0.182262	0.272315
First differences	0.317837	0.084382	0.048073	0.029306	0.042807

Note. Critical value of the ADF test at the 5% level is -3.466966. The maximum lag for the ADF test is given in parenthesis. Critical value for the KPSS test at the 5% level is 0.146.

Taking first differences, all variables are stationary. Therefore, the vector: $\Delta Xt=[\Delta rt\ \Delta yt\ \Delta dt\ \Delta qt\ \Delta pt]$ be used for the model estimation where Δpt is the inflation rate.

2.1.3. Lag length selection

To define the number of lags to be included in the model, we use three approaches that are: Log Likelihood (LL), Akaike Information Criteria (AIC) and Schwarz Criteria (SIC). The lag length of 1 is appropriate for our model as shown in table (2).

2.2. Estimation results

2.2.1. VAR estimation results

VAR (1) estimation results are presented in table (3).

After imposing the identification restrictions implied by the model (6), we present impulse response functions and variance decomposition to assess the dynamic effects of each shock to inflation rate fluctuations.

Table 2 : Lag length selection

	LL	AIC	SIC
p=1	825.0779*	-18.06995*	-17.22541*
p=2	809.5165	-17.34521	-15.78630
p=3	799.3373	-16.72877	-14.44566
p=4	800.3067	-16.36016	-13.34276
p=5	793.5737	-15.79937	-12.03739
p=6	785.0594	-15.18215	-10.66504
p=7	772.7409	-14.45709	-9.174052
p=8	785.5513	-14.33460	-8.274574

*The asterisk * denote the lag p to be hold*

Table 3 : VAR (1) estimation results

	Dependent variable				
	Δr_t	Δy_t	Δd_t	Δq_t	Δp_t
Δr_{t-1}	0.074809	0.000196	0.005019	-0.005184	0.001131
Δy_{t-1}	2.705161	0.374098	0.143920	0.367654	0.625664
Δd_{t-1}	-3.483906	-0.059278	0.204533	0.062407	-0.027459
Δq_{t-1}	-1.185511	-0.012591	0.061410	-0.221901	-0.020514
Δp_{t-1}	0.339490	0.027905	-0.019998	-0.090180	0.008039
Constant	-0.023922	0.006085	0.004861	-0.001772	0.026338

After imposing the identification restrictions implied by the model (6), we present impulse response functions and variance decomposition to assess the dynamic effects of each shock to inflation rate fluctuations.

2.2.2. Impulses responses function

Figure (2) displays the responses of inflation rate to various shocks. Responses to unit disturbances given by the impulse response functions are measured as percentage changes for the inflation rate.

The response of inflation rate to the terms of trade shocks is positive in the five first periods but negative in the five last periods. This response is about (0.0019) in the first quarter. In the second and third periods, inflation response falls respectively to (0.00099) and (0.000352) to bellow to (-0.00000316) at the sixth quarter. In response to a one standard deviation in supply shocks, inflation react positively at all time horizons.

The effect is decreasing slowly from (0.00392) in the first quarter of (0.000198) in the fifth quarter to (0.00000128) in the tenth quarter.

Inflation rate reacts negatively to a fiscal shock is negative at all horizons. It is about (-0.000159) in the first quarter, decreasing to (-0.000465) in the second quarter and increasing therefore to (-0.001002) in the third quarter and to (-0.000512) in the fourth quarter. In the fifth quarter, the effect is about (-0.000219). This effect still negative and decreasing to (-0.00000146) in the tenth quarter.

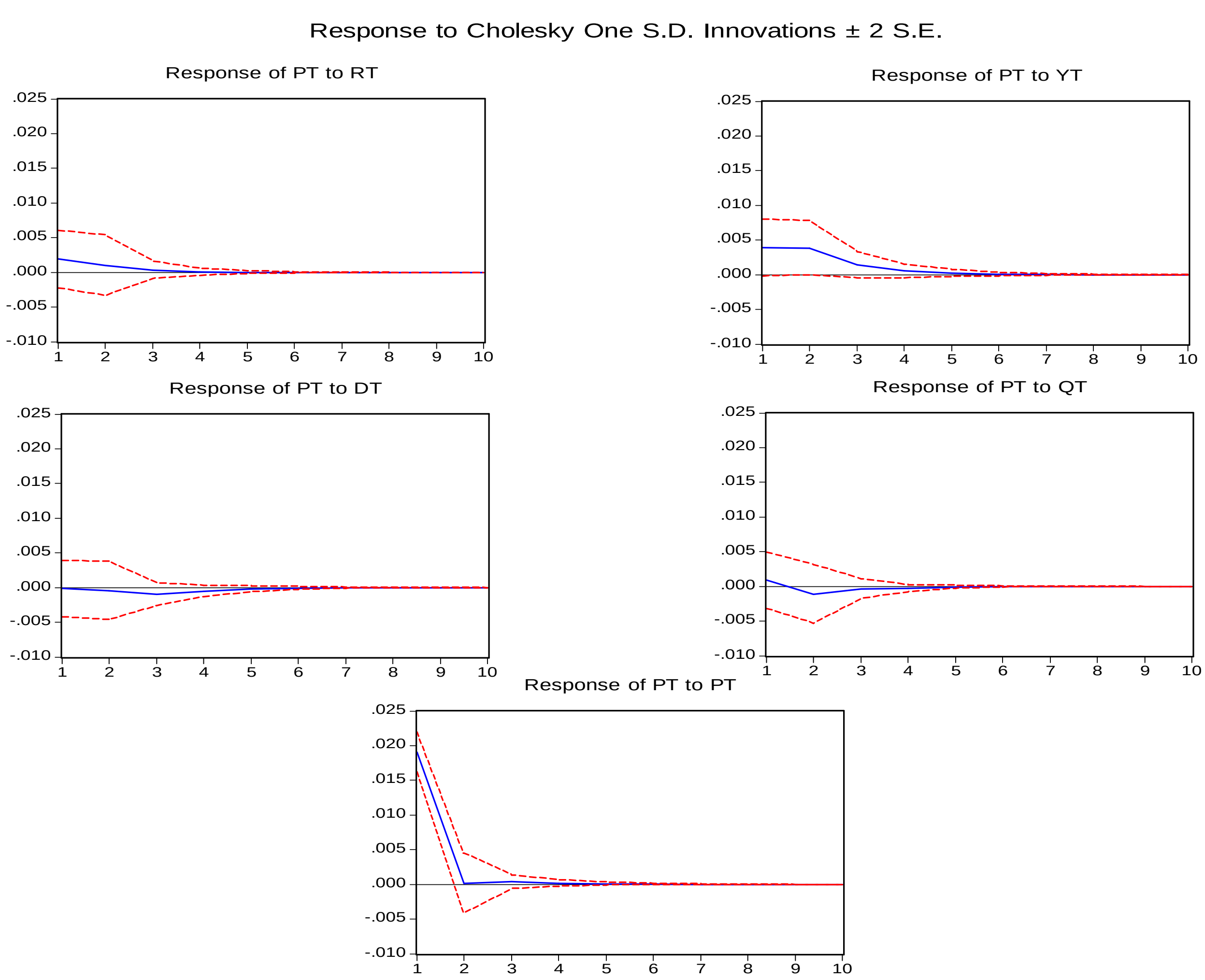

Figure 2 : Impulses responses function

In the first quarter, inflation rate response to a BOP shock in about (0.000870). This effect remains negative and decreasing from (-0.001119) to (-0.000000063) respectively in the second quarter and the tenth quarter.

Inflation rate responds positively and strongly to a monetary or nominal shock. The effect is most pronounced in the first and the third quarter, respectively about (0.019090) and (0.000388).

The effect decreases but the response still positive until the tenth quarter when inflation responses gradually fall towards no response.

2.2.3. Forecast errors variance decomposition analysis

Inflation forecast errors variance decomposition presented in table (4) allows us to measure the relative importance of the five mention shocks on inflation rate over different time horizons. For all periods, we derive the same conclusion. Variance decompositions light on the importance of monetary and supply shocks in inflation rate. At the two year horizon, about 89.89% of the variance in prices is accounted for by monetary shocks, while 8% is due to supply shocks. The impact of terms of trade shocks on prices seems to be weak (1.17 %) while the

contribution of BOP shocks in the variance of inflation forecast errors does not exceed 0.55%. Furthermore, the contribution of fiscal shocks to the inflation variance is extremely limited at several horizons (0.39%). In definitive, empirical results reveal the predominance of nominal shocks in explaining fluctuations of the inflation rates in Tunisia. Such results are interesting when studying inflation dynamics and inflation targeting adoption in Tunisia.

Table 4 : Inflation forecast errors variance decomposition

k	ε^r	ε^s	ε^f	ε^z	ε^m
1	0.945043	3.999702	0.006547	0.197050	94.85166
4	1.168407	8.006212	0.371894	0.541964	89.91152
8	1.168083	8.015156	0.385603	0.543904	89.88725
12	1.168083	8.015158	0.385608	0.543905	89.88725
16	1.168083	8.015158	0.385608	0.543905	89.88725
20	1.168083	8.015158	0.385608	0.543905	89.88725

Conclusion

The purpose of this paper has been to investigate the sources of Tunisian inflation rate fluctuations. Inflation rate experienced several change since 1970. During this period, Tunisia implemented several stabilization programs and monetary and fiscal policies aiming at boosting economic growth and reducing inflation.

The model was estimated using quarterly data from 1987:Q3 to 2012:Q4. Estimation results outline the dominance of monetary and supply shocks in inflation rate fluctuations. Although, the literature on macroeconomic fluctuations in emerging markets emphasizes the importance of external shocks, effects of terms of trade shocks seem negligible in the explanation of Tunisian inflation change (1.15%). Balance of payment shocks and fiscal shocks have a slight contribution in inflation rate fluctuations.

To allow for a better understanding of inflation change, we could add other foreign and domestic variable as the country became more open and economically and financially integrated and structural factors which play a crucial role in output and inflation volatility. Therefore, it will be interesting to fit a model with a large set of variables without having to impose economic restriction and specifying a casual ordering between variables for the better understanding the dynamics of inflation.

References

1. Akçay, O.C., C.E. Alper, and S. Özmucur (2001), "Budget Deficit, inflation and debt susceptibility: Evidence from Turkey (1970-2000)". Bogazici University
2. Alper, C.E. and M. Ucer (1998), "Some observations on Turkish inflation: A "random walk" down the past decade". Review of Social, Economic and Administrative Studies, Vol. 12, No.1, 7-38.
3. Blanchard, O. J. (1989), "A traditional interpretation of economic fluctuations." American Economic Review 79 (1), 1146-1164.
4. Blanchard, O. J. and D. Quah (1989), "The dynamic effects of aggregate demand and supply disturbances". American Economic Review 79, pp. 655-73.
5. Blanchard, O. J., and M. Watson (1986), "Are business cycles all Alike". NBER working papers No. 1392.
6. Ball, L. (1993), "The dynamics of high inflation". NBER working paper series. Working paper No 4578.
7. Begg, D. (2002), "Growth, integration, and macroeconomic policy design: Some lessons for Latin America. North American". Journal of Economics and Finance 13 (2002).
8. Buckle, R.A., K. Kim, H. Kirkham, N. McLellan and J. Sharma (2002), "A structural VAR model of the New Zealand business cycle". New Zealand Treasury Working Paper 02/26.
9. Catao, L.A.V. and M.E. Terrones (2005), "Fiscal deficits and inflation". Journal of Monetary Economics 52 (2005) 529--554.
10. Clarida, R. and J. Gali (1994) "Sources of real exchange rate fluctuations : How important are nominal shocks?", NBER Working Paper No. 4658.
11. Claus, I. (1997), "A measure of underlying inflation in the United States". Bank of Canada Working Paper 97-20.
12. Claus, I. (1999), "Estimating potential output for New Zealand: a structural VAR approach" .Reserve Bank of New Zealand. Discussion Paper Series.
13. Dibooglu, S. and A. Kibritcioglu (2004), "Inflation, output growth, and stabilization in Turkey, 1980--2002". Journal of Economics and Business 56 , 43--61.
14. Dibooglu, S. and A.M. Kutan (2001), "Sources of inflation and output fluctuations in Poland and Hungary: Implications for full membership in the European Union". Center for European Integration Studies. Working Paper B16 2001.
15. Dellas, H. (2005), Summary of the main points, Gerzensee.
16. Engel, C. (1996), "Long-run PPP may not hold after all". NBER Working paper, No. 5646
17. Fisher, L. A. and H. Huh (2001), "Real exchange rates, trade balances and nominal shocks: Evidence for the G-7". School of Economics. University of New South Walesand and Hallym University.
18. Hogan, S., M. Johnson, and T. Laflèche (2001), "Core inflation". Bank of Canada. Technical Report No. 89.
19. Khan, M.S. (2002), "Inflation, financial deepening, and economic growth". International Monetary Fund.
20. Kibritcioglu, A. (2004), "A short review of the long history of Turkish high Inflation". Department of Economics. Faculty of Political Sciences. Ankara University
21. King, R.G., C.I. Plosser, J. Stock and M. Watson (1991), "Stochastic trends and economic fluctuations", American Economic Review, Vol. 81, No. 4, pp. 819-839
22. Kose, M.A. and R. Riezman (2000), "Trade shocks and macroeconomic fluctuations in Africa". Graduate School of International Economics and Finance, Brandeis University.
23. Lastrapes,W. D., (1992), "Sources of fluctuations in real and nominal exchange rates". Review of Economics and Statistics, Vol. 74, pp. 530--39.
24. Lothian, J. and M. Taylor (1996), "Real exchange rate behaviour : the recent float from the perspective of the past two centuries". Journal of Political Economy 104, 488-509.
25. Prakash, L.and S. Phillip (2001), "Sources of inflation in developing countries". International Monetary Fund. Working paper 01/198.
26. Sargent, T., Wallace, N., 1981. "Some unpleasant monetarist arithmetic". Federal Reserve Bank of Minneapolis. Quarterly Review 5, 1--17.
27. Sarno, L. and M. P. Taylor (2002), "Purchasing Power Parity and the real exchange rate". International Monetary Fund 2002, Vol. 49, No. 1.
28. Schneider, M. (2004), "The impact of oil price changes on growth and inflation". Monetary Policy and the Economy Q2/04.
29. Shapiro, M.D. and J. Watson (1988), "Sources of business cycle fluctuations". Cowles Fondation for Research in Economics at Yale University. Dicussion Paper No. 870.
30. Sims, C.A. (1980), "Macroeconomics and reality". Econometrica, Vol 48, No. 1.