



Banque Centrale de Tunisie

Interaction of Monetary and Fiscal Policies in Emerging countries (Tunisian Economy)

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Motivation

- Tunisia faces large fiscal deficits and rapidly increasing public debt. The fiscal deficit (including grants) averaged 5.7 percent of GDP in 2012-2016; it reached 6.1 percent of GDP in 2017.
- Programmed fiscal effort (under IMF EFF program) is anchored in improvement of the budget deficit at around 4.9% of GDP in 2018 and projected to 3.9% by end 2019. This control shall be ensured by a reduction in energy subsidies through the adoption of automatic quarterly adjustments of hydrocarbons prices at the pump, containing the wage bill and reducing risks from State Own Enterprises (SOE's).
- Central bank refinancing reached TND 16,5 billion at the end of March 2019 against TND 15,8 in 2018 and TND 10,9 billion in 2017. This prompted the CBT to widen its interest rate corridor from 50 to 200 basis points in December 2017. The interbank rate rose from 5,2 at end December 2017 to 5,75 percent at the beginning of 2018 to 7,83 percent in May 2019. Consequently, interest rate increases during the remainder of the year, complemented with a tightening of the Central Banks collateral framework, are warranted to avoid risks to banking sector stability.
- **An open question is whether monetary and fiscal policies are crossed in small open economies, particularly in Tunisia,**

- The process of monetization mainly through government borrowing and its consequences on consumer prices index (CPI) inflation. The continuous increasing trend in both CPI, notably in 2016 pushes central bank to increase its policy rate.
- Hence, a challenge between fiscal and monetary authorities over budget deficits and borrowing from Central Bank of Tunisia drive the debate on the interactions of fiscal and monetary policies. Moreover, public debt levels in conjunction with weak economic activity and limited deposit growth have put pressures on liquidity and bank's balance (Central Bank and commercial banks) (as shown in Figure3)- but are set to decline in 2018.

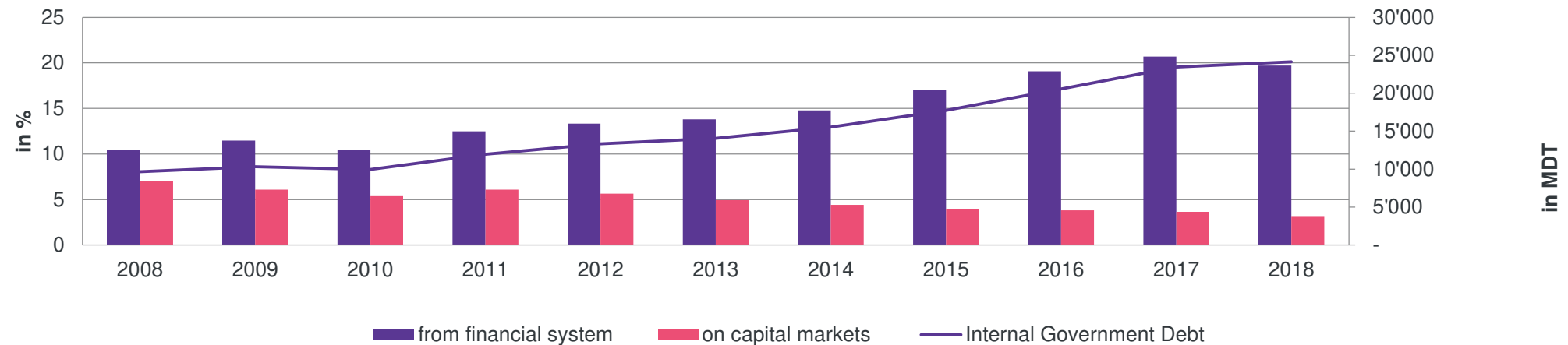


Figure 3: Trend in Domestic public indebtedness (right scale)by source of financing (left scale)

- **In this paper we focus on:**

- this paper will be devoted to the study of the interaction between monetary and fiscal policy in Tunisia in order to clear the effectiveness of policy mix for the Tunisian economy that would be able to solve the issues of economic growth and unemployment,

- **What we do?**

- Due to a shortness of the time series availability for annual variables like of fiscal variables as General revenues, General expenditure we used a Structural VAR Panel analysis for MENA region (Jordan, Egypt, Morocco, Tunisia, and Lebanon). Instead of working on 18 annual data dating from 1990 to 2018, we will work on a 174 observations panel.

- Estimation taken from an SVAR Panel model, with six variables: GDP at constant prices (GDP), inflation rate (INF), Money Market Rate (TMM), General expenditure (Public Expenditure) and General revenues.

Empirical specification

The panel VAR in structural form is:

$$A_0 Z_{i,t} = A(L)Z_{i,t-1} + CX_{i,t} + \varepsilon_{i,t} \quad (1)$$

Where $Z_{i,t}$ a vector of endogenous variables is $X_{i,t}$ is a vector with the country specific intercepts (C_i), country specific linear trends ($trend_{i,t}$). Matrix A_0 captures the contemporaneous relations between endogenous variables. The matrix $A(L)$ is the matrix polynomial in the lag operator L and the matrix (C) contains the coefficients of the country fixed effect, the country specific linear trends and the time fixed effects and the vector $\varepsilon_{i,t}$ contains the orthogonal structural shocks to each equation of the VAR.

Premultiplying by A_0^{-1} gives the model in reduced form:

$$Z_{i,t} = B(L)Z_{i,t-1} + DX_{i,t} + u_{i,t} \quad (2)$$

In order to recover the structural shocks in $\varepsilon_{i,t}$ from the reduced form. Restrictions are imposed to A_0 matrix using Choleski-decomposition, thus restricting the upper triangular at zero.

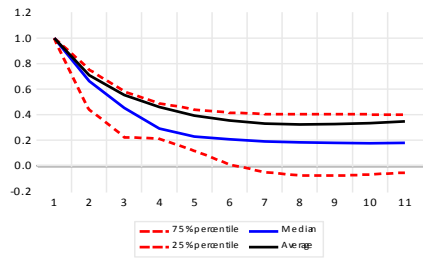
Theoretical results, applying Mundell-Fleming fixed exchange rate regime and free capitals mobility are obtained as follow:

Table 1. Theoretical results

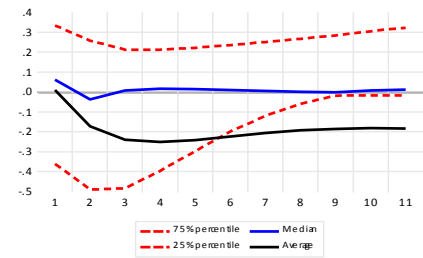
Variables	Effect of a restrictive monetary policy		Effect of an expansionary monetary policy	
	CT	LT	CT	LT
PIB	(null)	(null)	(nul)	(null)
Inflation	negative	null	négatif / (nul)	negative
TMM	positive	null	positif / nu	positive
Deficit fiscal	–	null	positive	null

Impulses Reaction Functions (IRF)

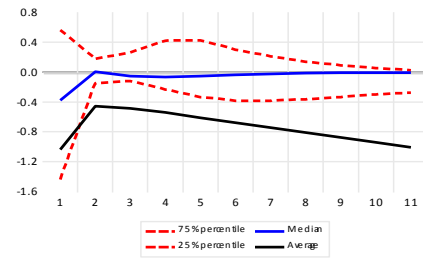
Composite response of FGOVERNMENT_EXPENDITURE to FGOVERNMENT_EXPENDITURE



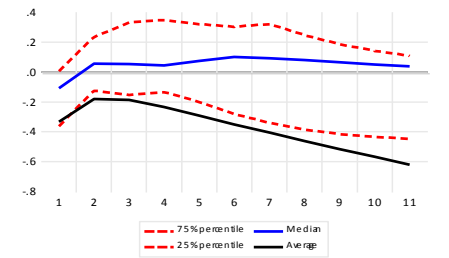
Composite response of FGOVERNMENT_REVENUES to FGOVERNMENT_EXPENDITURE



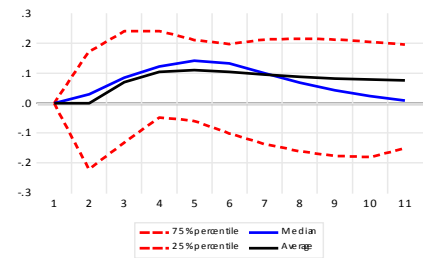
Composite response of FINFLATION to FGOVERNMENT_EXPENDITURE



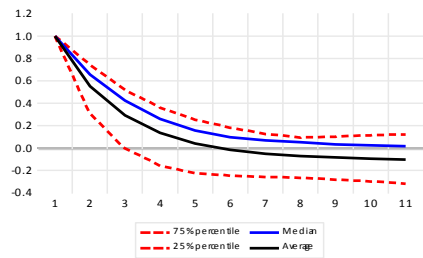
Composite response of FDISCOUNT_RATE to FGOVERNMENT_EXPENDITURE



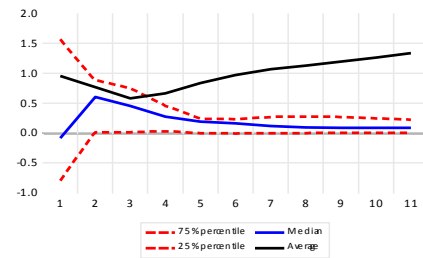
Composite response of FGOVERNMENT_EXPENDITURE to FGOVERNMENT_REVENUES



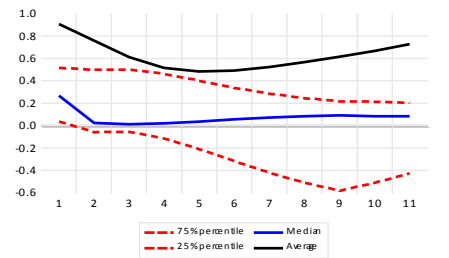
Composite response of FGOVERNMENT_REVENUES to FGOVERNMENT_REVENUES



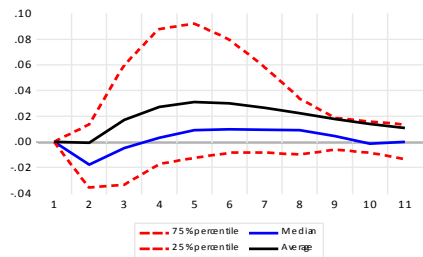
Composite response of FINFLATION to FGOVERNMENT_REVENUES



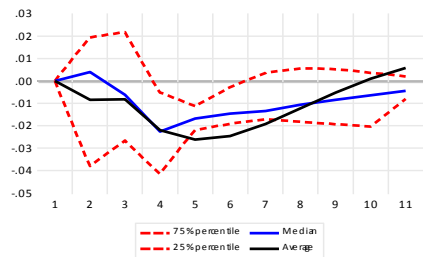
Composite response of FDISCOUNT_RATE to FGOVERNMENT_REVENUES



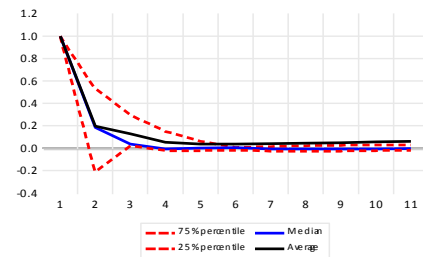
Composite response of FGOVERNMENT_EXPENDITURE to FINFLATION



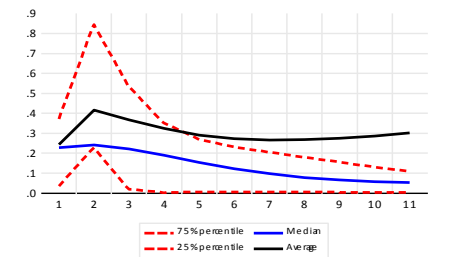
Composite response of FGOVERNMENT_REVENUES to FINFLATION



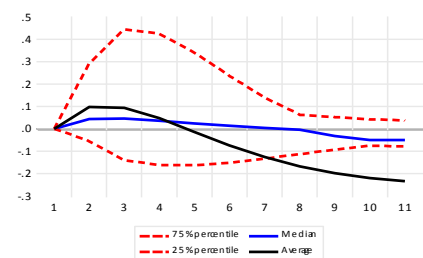
Composite response of FINFLATION to FINFLATION



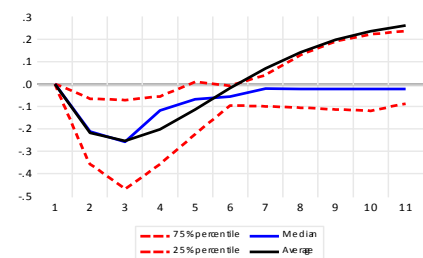
Composite response of FDISCOUNT_RATE to FINFLATION



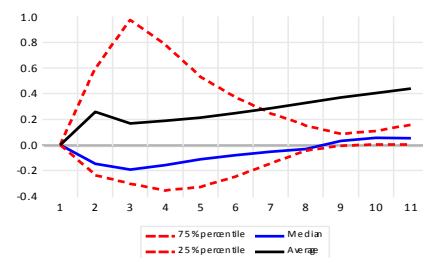
Composite response of FGOVERNMENT_EXPENDITURE to FDISCOUNT_RATE



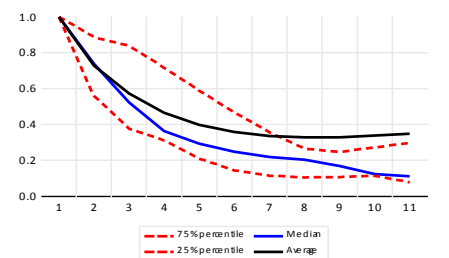
Composite response of FGOVERNMENT_REVENUES to FDISCOUNT_RATE



Composite response of FINFLATION to FDISCOUNT_RATE



Composite response of FDISCOUNT_RATE to FDISCOUNT_RATE



Main findings

- A large heterogeneity in the results. While the median impact of government tax shocks on policy rate is positive and reverts to about zero after two years, as shown in the bottom left panel. Indeed, the results for the 75th percentile suggest that there is a subset of countries for which the estimated impact is positive and high. Conversely, the results for the 25th percentile suggest that the negative impact takes longer to die out. Importantly, the average response can be quite noisy in presence of heterogeneous slopes and dynamics.
- For the median response, a one percentage (pp) shock in the tax revenues is associated with a 0.20 pp increase in policy rate. According this finding, Central Bank should not increase interest rate if government obtains revenue from taxes. Obtaining revenues from increased taxes means contractionary fiscal policy. So, it suggests an expansionary monetary policy in order to offset the negative spillovers of the contractionary fiscal policy. In the case of Tunisia the response of interest rate is not significant, it does mean that it exist a coordination between fiscal and monetary policies.
- Figure 5 are also informative regarding the impact of discount rate on budget deficit. The top right panel shows that the median response is negative and lasts for about two years. However, the variation across countries is considerable, as shown by the 25th and 75th percentile. The effects of the shocks in budget deficit and discount rate are positive as expected, and much more homogenous.
- we investigate the response of government spending to inflation is positive. It means that in the presence of inflationary pressure in the economy, the government expenditure increases. In the beginning, inflation shock simulates government spending and is rising up to 2 years. For median response, a one percentage (pp) shock in the inflation is simulated an increase of government expenditure for 0.2pp and it declines up to 3 years and then it reaches to its steady state.

Conclusion and Extension

- The results also show that monetary and fiscal policies in Tunisia are crossed, indeed expansionary fiscal policy led to an intervention by the monetary authorities to increase the interest rates and consequently to implement a restrictive monetary policy.
- To clear the optimal policy mix for the Tunisian economy that would be able to solve the issues of unemployment and economic growth witnessed by Tunisia in recent years, we need to develop a DSGE model,