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The Effect of Tunisian Cyclical Fiscal Policy on Economic Volatility: Understanding the Role of Institutional Quality

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Abstract

The recent decades have been marked by major instabilities that have increased the sensitivity of Tunisian business cycles to internal and external shocks. The economists must take this structural problem into account in their current decisions. Therefore, most institutional reforms were made in response to those instabilities after the Tunisian revolution. In addition, several fiscal indicators are partly intended to stabilize Tunisian economic fluctuations and avoid excessive government deficits. The influence of fiscal policy can be examined by distinguishing between cyclical and discretionary policies. Accordingly, it is interesting to investigate the impact of institutional quality on Tunisian fiscal policy conduct. This paper measures the effect of cyclical fiscal policy on Tunisian volatility. It analyzes the role of four fiscal indicators such as total government expenditure, administrative expenditure, capital expenditure, and loan expenditure. In addition, this paper tests the role of institutional variables on the stabilizing effect of fiscal policy. Indeed, the results are significant, and a tendency to apply a cyclical fiscal policy proved to be possible to reduce Tunisian volatility. Tunisia's experience is likely to be of interest to other developing countries.

Keywords: Instabilities, Institutional Reforms, Fiscal policy, Volatility, Tunisian Economy, Cyclical Component, Fiscal Indicators

JEL: E6, E62, O1

I. Introduction

The new prudential rules, aimed at reducing the fiscal deficit, require the sustainability of fiscal policy and its ability to reduce economic volatility. The role of fiscal policy is examined in terms of discretionary or cyclical changes. The discretionary fiscal policy is a change in government spending or taxes, but the cyclical fiscal policy is provided by the automatic stabilizers and is acting through lower revenues and higher public spending.

Substantial empirical evidence investigates the reacts of fiscal policy to the cycle. Leigh and Stehn (2009) show that discretionary fiscal easing occurs during economic recoveries in the G7 countries. Furthermore, Auerbach (2009) shows both the expenditure and revenue side reacted strongly counter-cyclically between 1984 and 2009 and that spending responded stronger than revenues. By contrast, the automatic stabilizers are found to react more

strongly to the cycle in the euro area than in the United States. Similar results based on an instrumental variable approach are reported in Lee and Sung (2007), which find that government spending is strongly counter-cyclical in most OECD economies. In addition, Ilzetzki and Vegh (2008) argue that developing countries pursue pro-cyclical fiscal policies while developed OECD countries are less pro-cyclical or a-cyclical by employing instrumental variables. As well, Fatas and Mihov (2012) demonstrate that the discretionary fiscal policy tends to be counter-cyclical in developed countries, but pro-cyclical in developing countries. More recently, Egert (2014) analyses the fiscal policy reaction to the cycle in OECD countries during the last 30 years. The paper examines the reactions of fiscal policy according to the size of the public debt and the public balances and the position in the cycle while introducing different sets of control variables. In addition, Alisdair McKay and Ricardo Reis (2016) measure the effect of automatic stabilizers on the dynamics of the U.S business cycle. They find that tax-and-transfer programs that affect inequality and social insurance can have a larger effect on aggregate volatility. The stabilizers have a more important role when monetary policy is constrained by the zero lower bound, and they affect welfare significantly through the provision of social insurance. On the other hand, some studies have shown the significant contribution of institutions and electoral rules in explaining the evolution of budget expenditures and deficits. For instance, an empirical study of OECD countries during the period 1980-2002, examined the significant role of several institutional factors on fiscal cyclicality, namely, the systems and electoral cycles, the type of fiscal rule adopted, the degree of the tax burden and the rigidities of public spending. Similar results were found by Fatas and Mihov (2005). The author indicates that fiscal policy is constrained by institutional rules and restrictions that affect the elasticity of public spending. In addition, the author shows that countries with significant institutional constraints have difficulties in implementing changes in discretionary policy. As well, Kondo and Svec (2009) propose an original model of competition for effective political power between majority and opposition coalitions in the case of the French departments. The results show that the per capita social expenditures in the French departments depend on the effective political power of the majority.

Although research on the impact of fiscal policy on macroeconomic volatility and economic growth is growing, the role of institutional quality on the stabilizing role of fiscal policy is largely ignored. Furthermore, institutional quality has recently got increasing attention from researchers in explaining the differences in economic developments and macroeconomic performance across countries. Among the others, Talvi and Vegh (2005) mentioned that the difference in fiscal policy between countries is explained by the significant role of political institutions and economic structures. Indeed, with very low institutional structure, both cyclical and discretionary policy further increase macroeconomic volatility and reduce economic growth. It is, therefore, an imperative need to investigate the impact of institutional quality on fiscal policy conduct. Acemoglu et al. (2003) and Easterly (2005) show that once institutions are included in the regression, macroeconomic policies do not have a significant effect on growth. In addition, the IMF study on developed and emerging countries between 1970 and 2007 shows that the counter-cyclical effect of fiscal policies has been relatively weak. The institutional context seems to be the main explanatory factor. Discretionary policies require decision-making processes, which delays their implementation and often prevents the adoption of targeted measures. Similarly, Badinger (2012) examined the causal effect of cyclical fiscal policy on output volatility, in a sample of 88 countries during the period 1960 to 2004. By integrating the variables reflecting the political and institutional activities, the main objective of the Badinger (2012) study is to highlight the crucial role of cyclical fiscal policy and its transmission channels by considering its effect on volatility and economic growth. Badinger (2012) found that cyclical fiscal policy has a destabilizing effect on the economy and increases the volatility of output in the same way as discretionary fiscal policy.

This paper calculates the extent to which fiscal policy stabilises output volatility in Tunisia following institutional changes. For the scope of the analysis, we use high-frequency data (quarterly) in the period 1993 to 2017. As the purpose of this paper is to test the role of four cyclical fiscal indicators, such as, total government expenditure (CYC1), administrative expenditure (CYC2), capital expenditure (CYC3) and loans (CYC4), it is absolutely necessary to determine them first. So, in order to determine those components, we use a dynamic linear model (the state-space model) estimated by the Kalman filter and manipulated by the R software.

The remaining part of the paper is organized as follows. Section 2 deals with the determination of the cyclical and discretionary components of fiscal policy. Section 3 presents the empirical approach and results for determining

the impact of institutional variables on cyclical fiscal policy. Section 4 provides evidence on the relationship between cyclical fiscal policy and the output volatility. Section 5 concludes.

II. The Identification of Fiscal Policy Components

Following Fatas and Mihov (2003), we measure the cyclical components using the elasticity of each fiscal indicators (total government expenditure, administrative expenditure, capital expenditure, and loans) compared to real GDP growth. On the other hand, we follow Blanchard and Perotti (2002) and Alesina and Bayoumi (1996) while measuring the discretionary component as the residuals.

The majority of previous studies have adopted cross-sectional data by selecting a fairly large sample of countries. Our contribution in this work is to adopt a time series for a single country like Tunisia during the quarterly period from 1993 to 2017. We use a dynamic linear model (the state-space model) estimated by the Kalman filter and manipulated by the R software. All variables are logarithmic and are adjusted by the "X-13-ARIMA-SEATS" seasonal adjustment program (Zaric (2018)).

The model is presented as follows:

$$\Delta \ln G_t = \alpha_t + \chi_t \Delta \ln Y_t + \varepsilon_t \quad (1)$$

$$\chi_t = \theta \chi_{t-1} + \eta_t \quad (2)$$

Where,

- G: Fiscal indicators.
- Y: Real gross domestic product
- χ_t : Cyclical fiscal policy noted as "CYC."
- $\varepsilon_{i,t}$: Discretionary fiscal policy noted as "DISCR."

We construct four models for our fiscal policy:

- (CYC1 and DISCR1): we use the total government expenditure as a dependent variable;
- (CYC2 and DISCR2): we use the administrative expenditure as the dependent variable;
- (CYC3 and DISCR3): we use the capital expenditure as the dependent variable;
- (CYC4 and DISCR4): we use the loan expenditure as the dependent variable.

The models are estimated by the maximum likelihood estimation (MLE), and the results are presented in the appendix (Table 6)

In order to be able to reach a conclusion regarding the cyclicity of fiscal policy, we test the existence of the correlation between the cyclical components of the real GDP and fiscal policy. The results are presented in Table 1.

| | Correlation coefficient | | |
|-------------------------------------|-------------------------|---------|-------|
| | maximum | minimum | |
| Cyclical government expenditure | -0.11 | 0.87 | -7.75 |
| Cyclical administrative expenditure | -0.04 | 1.12 | -8.76 |
| Cyclical capital expenditure | -0.16 | -0.50 | -5.80 |
| Cyclical loan expenditure | 0.06 | 1.27 | -9.69 |

Table 1: Summary Statistics of the Tunisian Cyclical Fiscal Policy

As we can figure from the Table 1, the Tunisian economy is characterised by a negative correlation with total expenditure, administrative expenditure, and capital expenditure. However, the correlation coefficient is lower than -0.2, that states for a weak countercyclical fiscal policy. On the other side, the results present a positive correlation coefficient with loan expenditure, that stands for a procyclical fiscal policy. The analysis also results

present correlation coefficients lower than 0.1. The procyclicality can be explained by the fact that, during the recession, the Tunisian economy is not able to contract loans, or they can borrow at higher interest rates.

Indeed, there are evidence that the quality of institutions in the Tunisian economy affects the fiscal policy and plays a crucial role in the pro-cyclicality or acyclicality of fiscal policy.

III. The Effect of Institutional Variables on Cyclical fiscal Policy

To establish the link between cyclical fiscal policy and the institutional quality, we use the following model. This is a regression estimated by applying weighted ordinary least squares (WLS) method.

As weights, we use the inverse of the variance of cyclicality.

$$\ln CYC_t = \alpha + \lambda P_t + \delta X_t + \varepsilon_t \quad (3)$$

$$P_t = [NELEC_t, POLCON_t, MAJ_t, PRES_t] \quad (4)$$

$$X_t = [OPEN_t, GDPPC_t, TOT_t, RINV_t, GSIZE_t] \quad (5)$$

The four reported measures of political institutions are :

- POLCON: A measure of political constraints that is a continuous variable (from 0 to 1) of the number of veto points extended in the decision-making process. It's the extent to which a change in the preferences of any one actor may lead to a change in government policy (Henisz (2017)).
- NELEC: The average number of elections (Keefer (2017) database).
- MAJ: A dummy variable for the electoral system. It takes value 1 for the majoritarian system, and 0 for the proportional system (Keefer (2017) database).
- PRES: A dummy variable for the political system. It takes value 1 for presidential systems and 0 for parliamentary systems (Keefer (2017) database).

We use a set of control variables to allow for more reliable causal inferences:

- OPEN: The opening ratio;
- GDPPC: The level of development, measured by the logarithm of real GDP per capita;
- TOT: The terms of trade;
- RINV: The investment ratio;
- GSIZE : The size of the government.

The size of government variable differs according to the fiscal policy indicator. We propose four different measures:

- GSIZET : The total expenditure;
- ADMINGSIZET: The administrative expenditure;
- CAPGSIZET: The capital expenditure;
- LOANGSIZET: The loans.

In addition, to better understand the role of institutional quality, we propose to distinguish between its effect on the cyclical policy and that on the discretionary policy. To do this, we estimate another model by defining the dependent variable as a discretionary component (DISCR). The model is presented as follows:

$$\ln DISCR_t = \alpha + \lambda P_t + \delta X_t + \varepsilon_t \quad (6)$$

$$P_t = [NELEC_t, POLCON_t, MAJ_t, PRES_t] \quad (7)$$

$$X_t = [OPEN_t, GDPPC_t, TOT_t, RINV_t, GSIZE_t] \quad (8)$$

| | CYC1 | DISCR1 |
|---------------------|-----------------------|------------------------|
| Intercept | -1.8479 (1.6385) | 2.4401 (2.6891) |
| POLCON | 0.3136 (0.4533) | 1.1661 (0.7439) |
| MAJ | 0.9413** (0.3597) | 0.9390 (0.5904) |
| NELEC | -0.0254 (0.0758) | -0.1634 (0.1243) |
| PRES | 0.4490 (0.3106) | -0.0063 (0.5097) |
| RINV | 6.3994 (10.2704) | 4.2839 (16.8559) |
| OPEN | -1.6982** (0.7513) | 2.1512* (1.2330) |
| GDPPC | -0.8478 (4.1327) | -4.9995 (6.7827) |
| TOT | 3.1995* (1.7659) | -8.3563*** (2.8983) |
| GSIZET | 6.9920 (5.4583) | -17.2727* (8.9583) |
| R ² | 0.3737 | 0.2022 |
| Adj. R ² | 0.3096 | 0.1206 |
| Num. obs. | 98 | 98 |
| RMSE | 1.7691 | 2.9035 |

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 2: The Impact of Institutional Variables on Cyclical Fiscal Policy in Tunisia

The analysis of the first regression between the total public expenditure and the institutional variables (Table 2) shows that only the electoral system (majoritarian or proportional) is significant. We try to see, following the introduction of the majoritarian variable (MAJ), whether the electoral system contributes to excessive changes in fiscal policy. There is evidence that the degree of decentralization or the concentration of power in the budgetary institutions can lead to excessive deficits, as documented in Poterba (1994), and Von Hagen and Harden (1995). Persson and Tabellini (2001) argue that majoritarian regimes should be associated with more volatile discretionary policy and more pronounced electoral cycles. On the other hand, Alesina and Bayoumi (1996) argue that proportional systems lead to coalitions and fiscal deadlocks which delay stabilizations. This implies that proportional systems will be associated with larger measured volatility of policy due to non-adjustment to shocks. The positive coefficient of the majoritarian variable lends mild support to the claim that electoral system contributes to the elasticity of total public expenditure. In addition, the positive sign asserts that the electoral system does not seem to create more volatility in discretionary fiscal policy.

To better explain the role of institutional quality on fiscal policy, we move to measure its effect on the other fiscal indicators. The following table (Table 3) reports the results of the regressions.

The significant and positive coefficient of the majoritarian variable indicates that the electoral system no longer contributes to the discretionary volatility of public capital expenditure. For the other indicators, the coefficient is not significant.

| | CYC2 | DISCR2 | CYC3 | DISCR3 | CYC4 | DISCR4 |
|---------------------|-------------------------|-------------------------|-------------------------|--------------------------|-------------------------|---------------------------|
| Intercept | -5.0584*** (1.8777) | 2.1552 (2.2899) | 1.8584 (1.5479) | 4.6562** (1.9089) | 4.8254*** (0.8490) | -0.8121 (1.1559) |
| POLCON | 0.6727 (0.5852) | 1.4429** (0.7136) | 1.9458*** (0.6064) | -0.7273 (0.7478) | -0.2213 (0.5400) | 1.2427* (0.7352) |
| MAJ | 0.3167 (0.4476) | 0.5005 (0.5459) | -0.0930 (0.3888) | 0.9325* (0.4795) | 0.1115 (0.3161) | 0.6959 (0.4304) |
| NELEC | 0.1795* (0.0999) | 0.0234 (0.1218) | -0.1633 (0.1020) | -0.3232** (0.1258) | -0.0014 (0.0880) | -0.1446 (0.1199) |
| PRES | 1.6477*** (0.5031) | -0.2749 (0.6136) | 0.4952* (0.2867) | 0.1587 (0.3535) | -0.9288*** (0.2738) | 1.0964*** (0.3728) |
| RINV | 39.7951*** (13.0582) | 7.1270 (15.9253) | -26.3300* (13.9731) | 15.7725 (17.2322) | 2.1650 (11.7064) | 6.4415 (15.9389) |
| OPEN | -2.6728*** (0.9958) | 1.8101 (1.2145) | -2.2816** (1.0368) | -0.8023 (1.2787) | -4.6294*** (0.8702) | 0.8758 (1.1848) |
| GDPPC | -0.7236 (4.9356) | -3.2749 (6.0193) | -3.5735 (5.4532) | -13.3978** (6.7251) | 13.7152*** (4.2790) | -1.9160 (5.8261) |
| TOT | 6.9181*** (2.2999) | -10.9527*** (2.8049) | 1.4020 (2.3211) | -0.7040 (2.8625) | 1.4930 (2.0708) | 3.0886 (2.8195) |
| ADMINGSIZET | 27.1836*** (8.6426) | -20.5129* (10.5401) | | | | |
| CAPGSIZET | | | -34.8170** (15.5115) | -60.2490*** (19.1294) | | |
| LOANGSIZET | | | | | -52.7569** (24.1216) | -165.0900*** (32.8429) |
| R ² | 0.4736 | 0.2649 | 0.3882 | 0.1919 | 0.4045 | 0.2783 |
| Adj. R ² | 0.4197 | 0.1897 | 0.3257 | 0.1093 | 0.3436 | 0.2045 |
| Num. obs. | 98 | 98 | 98 | 98 | 98 | 98 |
| RMSE | 1.7493 | 2.1334 | 5.2115 | 6.4271 | 0.7093 | 0.9658 |

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 3: The Impact of Institutional Variables on Cyclical Fiscal Policy Components in Tunisia

The POLCON variable is introduced in the regression to capture the limits faced by governments in the implementation of economic policies. The presence of these constraints reduces the use of discretionary fiscal policy and favors the use of automatic stabilizers. Persson and Tabellini (2001) show that countries with more constrained governments should also experience less volatility in the discretionary policy.

Therefore, we observe a positive and significant effect of the POLCON variable. Indeed, the political constraints reduce the discretionary volatility of administrative and loan expenditure and contribute to the elasticity of capital expenditure in the Tunisian economy.

It should be emphasized that we introduce NELEC variable in order to control for the obvious possibility that fiscal policy is driven by the electoral cycle and also to determine the importance of accountability of politicians. Interestingly the number of elections has a negative and significant coefficient in the regression of discretionary capital expenditure, which is consistent with the view that elections hold politicians accountable in reducing the volatility in discretionary capital expenditure. On the other side, the variable contributes to the elasticity of administrative expenditure.

Finally, we introduce the PRES variable to test the effect of presidential system on fiscal policy. Persson and Tabellini (2001) imply that presidential regimes must be associated with a more volatile discretionary policy. The results of the presidential regimes are significant. We observe a positive and significant effect of PRES variable on the volatility of discretionary loan expenditure. Nevertheless, the variable shows a positive effect on administrative and capital cyclical expenditure and a negative effect on cyclical loan expenditure.

Knowing that fiscal policy does have an implication to economic growth, it is of great importance to analyze, in what follows, the effect of cyclical fiscal policy on Tunisian economic volatility.

IV. The effect of cyclical fiscal policy on economic volatility

We follow Badinger (2012), and we include the cyclical fiscal policy (CYC) as an explanatory variable. The dependent variable is the volatility of output and is defined by the standard deviation of the real GDP per capita growth rate. We use the logarithmic specification to avoid predicted negative values for the standard deviation of output growth.

Our study is based on two methods. In the first, we use the weighted ordinary least squares with control variables (WLS). The problem with this regression is the possibility of reverse causality of cyclical policy to output. Indeed, to deal with this problem, we use the two-stage least squares: with control variables and instruments (TSLS). The list of instruments includes the four institutional characteristics (POLCON, PRES, MAJ, and NELEC) and variables capturing the social characteristics of the country. We adopt, then, instrumental variables as mentioned by Badinger (2008) and Fatas and Mihov (2003), namely the logarithm of the population (POP) and the rate of urbanization (URBAN).

| | WLS1 | WLS2 | WLS3 | WLS4 |
|---------------------|------------------------|------------------------|------------------------|------------------------|
| Intercept | 0.0242*** (0.0020) | 0.0182*** (0.0016) | 0.0243*** (0.0036) | 0.0157*** (0.0022) |
| CYC1 | -0.0005 (0.0003) | | | |
| CYC2 | | -0.0006** (0.0002) | | |
| CYC3 | | | 0.0004 (0.0003) | |
| CYC4 | | | | 0.0007** (0.0003) |
| OPEN | -0.0033 (0.0021) | -0.0037 (0.0024) | -0.0085*** (0.0023) | -0.0074*** (0.0025) |
| RINV | -0.0752** (0.0304) | -0.0747** (0.0349) | -0.0426 (0.0363) | -0.0724** (0.0351) |
| TOT | -0.0034 (0.0052) | -0.0002 (0.0060) | -0.0069 (0.0057) | 0.0019 (0.0064) |
| GDPPC | 0.0601*** (0.0117) | 0.0715*** (0.0122) | 0.0602*** (0.0140) | 0.0671*** (0.0136) |
| GSIZET | -0.0511*** (0.0087) | | | |
| ADMINGSIZET | | -0.0362*** (0.0092) | | |
| CAPGSIZET | | | -0.1137*** (0.0379) | |
| LOANGSIZET | | | | -0.1121 (0.0707) |
| R ² | 0.5488 | 0.4810 | 0.4280 | 0.4098 |
| Adj. R ² | 0.5191 | 0.4468 | 0.3903 | 0.3709 |
| Num. obs. | 98 | 98 | 98 | 98 |
| RMSE | 0.0055 | 0.0045 | 0.0137 | 0.0022 |

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 4: The Impact of Cyclical Fiscal Policy on Tunisian Volatility (WLS)

The model is represented as follows:

$$\ln\sigma_t^y = \gamma_0 + \gamma_1 \ln CYC_t + x_t \delta + \mu_t \quad (9)$$

$$X_t = [OPEN_t, GDPPC_t, TOT_t, RINV_t, GSIZE_t] \quad (10)$$

The results obtained by the weighted ordinary least squares method (WLS) are summarized in the following table (Table 4).

There is no discernible effect of cyclical government expenditure on economic volatility. We observe an insignificant negative coefficient. Nevertheless, the cyclical administrative expenditure affect significantly the Tunisian economic volatility. The negative effect is reinforced by introducing the control variables (more precisely ADMINGSIZET). Therefore, we can rule in the idea that the government size contributes to the stabilizing role of cyclical fiscal policy. On the other hand, we observe a positive and significant coefficient of cyclical loan expenditure, which shows its destabilizing effect.

On the same, the introduction of institutional variables in the regression by using the two-stage least squares method (Table 5), indicates a negative coefficient of cyclical government expenditure and particularly of cyclical administrative expenditure. It seems that cyclical fiscal policy tends to lower the output volatility. This result is statistically significant.

Therefore, the improvement of institutional quality in Tunisia accentuates the stabilizing role of cyclical fiscal policy. Furthermore, it is recommended to focus on the cyclical administrative expenditure as a fiscal automatic stabilizer. However, we must take into account that, both cyclical capital and loan expenditures further increases Tunisian output volatility.

| | TSL1 | TSL2 | TSL3 | TSL4 |
|--------------------------|------------------------|------------------------|-----------------------|-----------------------|
| Intercept | 0.0215*** (0.0024) | 0.0166*** (0.0015) | 0.0130*** (0.0028) | 0.0092*** (0.0005) |
| CYC1 | -0.0009** (0.0004) | | | |
| CYC2 | | -0.0009*** (0.0003) | | |
| CYC3 | | | 0.0013*** (0.0004) | |
| CYC4 | | | | 0.0006 (0.0005) |
| GDPPC | -0.0527*** (0.0094) | | | |
| GSIZET | 0.0058 (0.0186) | 0.0215 (0.0199) | 0.0405* (0.0215) | 0.0165 (0.0215) |
| ADMINGSIZET | | -0.0452*** (0.0089) | | |
| CAPGSIZET | | | -0.0174 (0.0448) | |
| LOANGSIZET | | | | 0.0494 (0.0851) |
| eq1: R ² | 0.3965 | 0.3539 | 0.2508 | 0.1936 |
| eq1: Adj. R ² | 0.3772 | 0.3332 | 0.2269 | 0.1679 |
| Num. obs. (total) | 98 | 98 | 98 | 98 |

*** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 5: The Impact of Cyclical Fiscal Policy on Tunisian Volatility (TSL)

V. Conclusion

This paper measures the effect of cyclical fiscal policy on Tunisian volatility. It analyzes the role of four fiscal indicators such as total government expenditure, administrative expenditure, capital expenditure, and loan expenditure. In addition, this paper tests the role of institutional variables on the stabilizing effect of fiscal policy. It seems absolutely necessary to use these fiscal indicators to investigate the effect of fiscal implicit rules and constraints on the evolution of government expenditure and to demonstrate the extent to which this fiscal policy is effective.

The main finding is that the political constraints reduce the discretionary volatility of administrative and loan expenditure, and contribute to the elasticity of capital expenditure in the Tunisian economy. Moreover, the results show that the electoral system contributes to the elasticity of total public expenditure and no longer contributes to the discretionary volatility of public capital expenditure. Interestingly the number of elections hold politicians accountable in reducing the volatility in discretionary capital expenditure. Finally, we observe that the presidential system seems to affect public expenditures and deficits.

Subsequently, we analyze the effect of cyclical fiscal policy on volatility. Our study, on quarterly data, contradicts the ideas of Badinger (2012) and gives a significant vision on the role of the automatic stabilizers in the reduction of the aggressive volatility for the Tunisian economy during the period (1993-2017). Furthermore, it is recommended to focus on the cyclical administrative expenditure as a fiscal automatic stabilizer. However, we must take into account that, both cyclical capital and loan expenditures further increases Tunisian output volatility. The study contributes to the literature on two fronts. First, the study sheds lights on the impacts of institutional reforms on cyclical government expenditure and more precisely on administrative, capital, and loan expenditure. Second, the study investigates the role of institutional quality on the stabilizing role of cyclical fiscal policy. Our findings are important due to the fact that policy makers can use the recognized fiscal policy indicators accordingly, to enhance the desired direction of the needed fiscal policy to stabilize the Tunisian economy. This will be better applied following the improvement of institutional quality.

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Table

Table 6: Appendix: The Cyclical and Discretionary Components of Fiscal Policy

| | CYC1 | DISCR1 | CYC2 | DISCR2 | CYC3 | DISCR3 | CYC4 | DISCR4 |
|----|-------|--------|-------|--------|-------|--------|-------|--------|
| 1 | -7.75 | -0.00 | -8.76 | -0.00 | -4.31 | -0.00 | -9.69 | -0.00 |
| 2 | 0.87 | 0.00 | 1.12 | 0.00 | -2.16 | -0.00 | 1.27 | 0.00 |
| 3 | 0.30 | -0.23 | 0.55 | -0.30 | -4.22 | 0.02 | 0.71 | -0.02 |
| 4 | 0.18 | 0.52 | 0.43 | 0.68 | -3.29 | 0.08 | 0.59 | 0.04 |
| 5 | 0.06 | 0.11 | 0.38 | 0.07 | -2.11 | 0.08 | 0.22 | 0.03 |
| 6 | -0.04 | 0.11 | 0.32 | 0.10 | -1.83 | 0.04 | -0.10 | 0.02 |
| 7 | -0.01 | -0.13 | 0.36 | -0.24 | -1.66 | 0.14 | -0.13 | 0.01 |
| 8 | -0.32 | 0.26 | 0.08 | 0.35 | -1.35 | 0.07 | -0.72 | 0.02 |
| 9 | -0.46 | -0.21 | -0.15 | -0.52 | -3.21 | 0.69 | -2.72 | -0.05 |
| 10 | -0.55 | -0.17 | -0.34 | -0.42 | -1.44 | 0.58 | -1.67 | -0.04 |
| 11 | -0.81 | -0.26 | -0.77 | -0.49 | -1.01 | 0.27 | -0.84 | -0.03 |
| 12 | -0.81 | 0.01 | -0.78 | -0.18 | -0.99 | 0.25 | -0.79 | -0.04 |
| 13 | -0.98 | -0.11 | -0.48 | 0.24 | -1.51 | -0.98 | -0.34 | 0.11 |
| 14 | -1.02 | -0.04 | -0.39 | 0.16 | -0.83 | -0.67 | 0.09 | 0.06 |
| 15 | -1.10 | -0.09 | -0.39 | -0.01 | -0.61 | -0.40 | 0.24 | 0.04 |
| 16 | -1.05 | 0.12 | -0.31 | 0.37 | -0.50 | -0.62 | 0.33 | 0.08 |
| 17 | -1.05 | -0.00 | -0.46 | 0.44 | -0.79 | -0.70 | 0.73 | -0.16 |
| 18 | -1.03 | -0.04 | -0.54 | 0.27 | -0.91 | -0.31 | 0.89 | -0.13 |
| 19 | -0.98 | -0.16 | -0.55 | 0.02 | -0.86 | 0.22 | 1.00 | -0.16 |
| 20 | -1.01 | 0.07 | -0.68 | 0.32 | -0.85 | 0.02 | 1.05 | -0.06 |
| 21 | -0.96 | 0.41 | -0.71 | -0.39 | -1.02 | 1.56 | 1.12 | 0.26 |
| 22 | -0.90 | 0.37 | -0.77 | -0.39 | -1.24 | 1.42 | 1.18 | 0.24 |
| 23 | -0.85 | 0.20 | -0.93 | -0.49 | -1.68 | 1.19 | 1.24 | 0.17 |
| 24 | -0.82 | 0.48 | -0.94 | -0.15 | -1.73 | 0.55 | 1.26 | 0.31 |
| 25 | -0.77 | -0.39 | -0.97 | 0.16 | -1.98 | -1.13 | 1.27 | -0.08 |
| 26 | -0.74 | -0.37 | -0.99 | 0.13 | -2.24 | -0.99 | 1.27 | -0.09 |
| 27 | -0.75 | -0.53 | -0.99 | -0.03 | -2.15 | -0.81 | 1.27 | -0.16 |
| 28 | -0.59 | 0.81 | -0.62 | 1.32 | -2.14 | -0.02 | 1.23 | -0.19 |
| 29 | -0.39 | 0.57 | -0.43 | 0.41 | -2.48 | 1.41 | 1.13 | -0.24 |
| 30 | -0.19 | -1.16 | -0.16 | -1.37 | -2.12 | -0.40 | 1.12 | 0.03 |
| 31 | -0.18 | 0.05 | -0.19 | -0.15 | -1.51 | 0.90 | 1.05 | -0.21 |
| 32 | -0.40 | 0.82 | -0.39 | 0.64 | -1.43 | -0.11 | 0.94 | 0.18 |
| 33 | -0.48 | 0.44 | -0.57 | 0.80 | -1.21 | -0.72 | 0.87 | 0.22 |
| 34 | -0.49 | -1.64 | -0.57 | -1.32 | -1.25 | -1.94 | 0.87 | 0.02 |
| 35 | -0.58 | 0.35 | -0.79 | 0.60 | -1.07 | -0.56 | 0.79 | 0.22 |
| 36 | -0.60 | 0.25 | -0.87 | 0.54 | -1.02 | -0.75 | 0.79 | 0.11 |
| 37 | -0.61 | -0.02 | -0.91 | -0.07 | -0.99 | 0.07 | 0.69 | -0.13 |
| 38 | -0.63 | -0.37 | -0.97 | -0.66 | -0.97 | 0.39 | 0.70 | 0.05 |
| 39 | -0.60 | -0.17 | -0.78 | -0.60 | -1.09 | 0.60 | 0.65 | 0.16 |
| 40 | -0.48 | 0.61 | -0.65 | 0.43 | -0.95 | 0.67 | 0.65 | 0.00 |
| 41 | -0.48 | -0.33 | -0.65 | -0.04 | -0.94 | 0.08 | 0.64 | -0.44 |
| 42 | -0.41 | -0.40 | -0.59 | -0.24 | -1.05 | 0.49 | 0.73 | -0.34 |
| 43 | -0.43 | -0.48 | -0.60 | -0.20 | -1.06 | -0.18 | 0.70 | -0.44 |
| 44 | -0.21 | 0.94 | -0.21 | 1.26 | -0.86 | 0.72 | 0.52 | -0.47 |
| 45 | -0.30 | 0.44 | -0.31 | 0.43 | -0.75 | -0.49 | 0.27 | 0.52 |
| 46 | -0.39 | -0.40 | -0.41 | -0.40 | -0.94 | -0.84 | 0.42 | 0.31 |
| 47 | -0.38 | 0.38 | -0.40 | 0.39 | -0.95 | -0.83 | 0.42 | 0.40 |
| 48 | -0.83 | 1.07 | -0.94 | 1.02 | -1.01 | 0.15 | -0.07 | 0.55 |
| 49 | -1.87 | -1.67 | -2.86 | -1.77 | -1.40 | -0.96 | -0.40 | -0.28 |
| 50 | -1.94 | 0.33 | -2.91 | 0.08 | -1.51 | 0.98 | -0.35 | -0.14 |
| 51 | -1.95 | -0.85 | -2.95 | -1.06 | -1.51 | -0.04 | -0.35 | -0.17 |
| 52 | -2.00 | 0.28 | -3.01 | 0.09 | -1.58 | 1.01 | -0.33 | -0.13 |
| 53 | -2.24 | 0.26 | -2.89 | -0.04 | -1.50 | -0.25 | -0.74 | 0.66 |
| 54 | -2.02 | 0.73 | -2.54 | 0.55 | -1.50 | -0.02 | -0.57 | 0.62 |
| 55 | -1.76 | 0.67 | -2.14 | 0.51 | -1.58 | -0.43 | -0.38 | 0.63 |
| 56 | -1.56 | 0.24 | -1.95 | 0.12 | -1.71 | -0.27 | -0.06 | 0.60 |
| 57 | -0.99 | -0.93 | -1.75 | -0.15 | -1.77 | 0.10 | 0.57 | -1.53 |
| 58 | -1.04 | -0.16 | -1.25 | 0.88 | -1.47 | 0.90 | 0.23 | -1.57 |
| 59 | -1.04 | 0.00 | -1.16 | 0.81 | -1.43 | 0.66 | 0.18 | -1.43 |
| 60 | -0.99 | 0.74 | -1.02 | 1.43 | -1.36 | 1.44 | 0.14 | -1.34 |
| 61 | -1.01 | -0.17 | -1.44 | -2.25 | -1.32 | 0.47 | 0.27 | 2.44 |
| 62 | -1.43 | 0.68 | -0.71 | -1.11 | -2.08 | 1.26 | -1.51 | 2.45 |
| 63 | -1.38 | -0.10 | -0.29 | -1.52 | -1.99 | -0.14 | -0.72 | 2.30 |
| 64 | -1.00 | 1.04 | -0.49 | -1.05 | -1.72 | 0.58 | -1.47 | 2.39 |
| 65 | -1.47 | -2.98 | -0.59 | -1.00 | -2.19 | -2.30 | -2.04 | -3.23 |
| 66 | -3.00 | -2.12 | -0.75 | -0.51 | -4.95 | -1.48 | -0.01 | -3.09 |
| 67 | -2.68 | -1.42 | -0.94 | 0.83 | -2.82 | -1.26 | -0.90 | -2.95 |
| 68 | -2.34 | -1.35 | -0.99 | 0.71 | -2.67 | -0.78 | -1.29 | -2.84 |
| 69 | -2.16 | 3.22 | -1.94 | 2.74 | -3.44 | 0.97 | -0.64 | 2.12 |
| 70 | -1.78 | 2.51 | -0.99 | 1.60 | -2.40 | 0.88 | -2.12 | 2.04 |
| 71 | -1.15 | 2.33 | -2.42 | 1.81 | -4.28 | 0.82 | -0.14 | 1.93 |
| 72 | -0.43 | 1.03 | -0.80 | 0.98 | -1.84 | 0.64 | 0.85 | 1.58 |
| 73 | -0.93 | 1.20 | -1.14 | 0.56 | -2.17 | 0.26 | 0.85 | -0.01 |
| 74 | -2.41 | -3.26 | -4.55 | -2.84 | -3.23 | -1.12 | 0.47 | -1.33 |
| 75 | -1.82 | -1.18 | -2.33 | -1.14 | -2.72 | -0.68 | 0.58 | -0.69 |
| 76 | -1.72 | -0.73 | -2.17 | -0.52 | -2.62 | -0.62 | 0.59 | -0.83 |
| 77 | -1.60 | 1.41 | -1.92 | 1.60 | -2.78 | -1.09 | 0.62 | 1.00 |
| 78 | -1.78 | 0.44 | -2.33 | 0.49 | -2.10 | -1.56 | 0.55 | 1.14 |
| 79 | -1.49 | 0.71 | -1.68 | 0.84 | -2.57 | -1.04 | 0.62 | 0.86 |
| 80 | -1.24 | 0.36 | -1.26 | 0.43 | -5.80 | -0.74 | 0.72 | 0.70 |
| 81 | -1.08 | -0.34 | -0.76 | -1.08 | -1.77 | 1.90 | 0.75 | -0.23 |
| 82 | -1.08 | -0.71 | -0.76 | -1.50 | -1.79 | 2.90 | 0.75 | -0.47 |
| 83 | -0.97 | -2.09 | -0.61 | -2.84 | -1.70 | 1.59 | 0.75 | -0.45 |
| 84 | -0.97 | -0.22 | -0.61 | -1.00 | -1.72 | 2.37 | 0.75 | -0.40 |
| 85 | -1.05 | -0.72 | -0.62 | -0.12 | -1.51 | -1.72 | 0.74 | -0.51 |
| 86 | -1.09 | -0.88 | -0.63 | -0.21 | -1.46 | -1.88 | 0.74 | -0.47 |
| 87 | -1.25 | 0.56 | -1.01 | 1.37 | -1.87 | -1.62 | 0.75 | -0.30 |
| 88 | -1.56 | -0.31 | -0.93 | 0.09 | -1.39 | -0.65 | 0.67 | -0.61 |
| 89 | -1.98 | 1.07 | -1.09 | 0.75 | -1.21 | 1.08 | 0.65 | 0.54 |
| 90 | -2.02 | 1.01 | -1.09 | 0.54 | -1.18 | 2.01 | 0.64 | 0.44 |
| 91 | -2.13 | 0.17 | -1.04 | -0.19 | -1.06 | 0.86 | 0.62 | 0.47 |
| 92 | -1.34 | 1.91 | -2.44 | 1.80 | -0.65 | 1.44 | 0.56 | 0.60 |
| 93 | -1.45 | 0.19 | -4.71 | 0.56 | -0.58 | -0.40 | 0.50 | -0.53 |
| 94 | -1.69 | 0.80 | -2.22 | 1.35 | -0.57 | -0.14 | 0.49 | -0.39 |
| 95 | -1.72 | 0.09 | -1.90 | 0.58 | -0.50 | -1.35 | 0.48 | -0.38 |
| 96 | -1.11 | 0.57 | -1.15 | 1.54 | -1.27 | -1.91 | 0.48 | -0.02 |
| 97 | -0.80 | -1.68 | -0.73 | -2.16 | -1.12 | -0.84 | 0.49 | 0.08 |
| 98 | -0.62 | -1.52 | -0.49 | -1.90 | -1.09 | -0.26 | 0.49 | 0.13 |
| 99 | -0.40 | -1.37 | -0.21 | -1.63 | -1.03 | -0.32 | 0.50 | 0.11 |