Fiscal Policy Shocks and Its Effect on Long-Term Consumption Following Tagkalakis Model

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Abstract: The main motivation for this study is to investigate the effects of different fiscal and monetary policies on long-term consumption in Kuwait. For this specific aim, different fiscal and monetary shocks are studied. Oil revenue is one of the main sources of income for government in Kuwait so fluctuation in oil prices was considered as well. A series of econometrics pre-test has been used and finally ordinary least square method (OLS) was applied. It can be argued that government fiscal policies have a positive impact on long-term consumption.

1. Introduction

Monetary policy is defined by the relationship between the interest rate in the country's economy - the price at which the money can be borrowed - and the total money supply [1]. Monetary policy uses a variety of tools to control one or to affect things such as economic growth, inflation, exchange rates, and unemployment [2]. There is a relationship between fiscal and monetary policies and the determination of general equilibrium using investment-savings, liquidity-money (IS-LM) tools [3].

In economics and political science, fiscal policy uses the government revenue collection (tax) and expenditure (expenses) to influence the economy [4]. The two main tools of the fiscal policy are taxation and government spending [5]. Changes in the level and composition of taxation and government spending can affect the following variables in the economy:

1) Total demand and level of economic activity
2) Pattern of industry allocation
3) Distribution of income.

Fiscal policy refers to the use of government funds to influence economic activities. The three main stances of fiscal policy are:

1) Neutral fiscal policy is usually undertaken when an economy is in equilibrium [6];
2) Expansionary fiscal policy involves government spending exceeding tax revenue and is usually undertaken during recessions [7];
3) Contractionary fiscal policy occurs when government spending is lower than tax revenue and is usually undertaken to pay down government debt [8]. The monetary policy is linked to the interest rate and availability of credit. The monetary policy tool includes short-term interest rates and bank reserves through the monetary base. For centuries, there were only two sorts of monetary policy: (a) decisions about the power to mint coins and (b) decisions to print paper money to create credit [9]. Although interest rates are now considered part of monetary policy, they were not consistent with other forms of monetary policy. According to previous studies, only those countries with a certain long-term-plan regarding their socio-economic goals can succeed in this regard and create a stable economy which can provide their people which what they desire [10]. In fact, it can be argued that any specify policy which is chosen by government can directly or indirectly influence individual’s life and change their consumption or saving behavior [11, 12]. Moreover, long-term agreements can result in lower cost and higher efficiency [13].

2. METHODOLOGY

Considering that the main aim is to examine the role of fiscal policy in Kuwait's business cycle, using a model that includes fiscal policy shocks will be efficient. Therefore, the theoretical foundations of this study are based on the developed model by Tagkalakis (2008), which is a neoclassical model [14]. The basic assumption of Tagkalakis is that the government is mainly financed by taxes. Since Kuwait is a country that provides a high percentage of its income with oil exports, therefore, oil price volatility affects the financial decisions of the government. It should be mentioned that kind sort of financial decisions which are taken by the government will change individual’s daily life and can influence their purchasing power [15]. Modifications in this model are applied which the results can be observed in the budget plan, wage and consumption function. Hence the following is a modified Tagkalakis model that applies to economies such as Kuwait. Consider a two-period model. It is assumed that if the economy is in recession during the first period, it will be boosted in the second...
period and vice versa. The probability of transition from the first period to the second one is equal to one. Assuming that the total population is equal to one and does not grow through time, total population can be divided into two different groups:

First group ($\lambda$) is people with a limit access to liquidity and no ability to pay off their debt, and the rest which is ($\lambda$-1), or those who have full access to credit markets with any interest rate $R$ which are able to save money and pay off their debt. These people are called people of type U. In good economic conditions when savings is available, both types of people achieve rate of returns equal to ($R + 1$) by investing. However, in bad economic conditions, only people of type U can borrow and pay in the subsequent period. It is also assumed for simplicity that the time preference rate and the rate of return on the market are equal. It is assumed that the wage rate of all people who are participating in the labor market is higher in good economic conditions than bad one.

All people maximize the following expected utility:

$$EU(C_1, C_2)$$

Where $E$ represents the consumption of the first period and $C_2$ represents the consumption of second period.

The Von Neumann–Morgenstern utility function is used. Taxes received by the government are one-off taxes. The interim budget constraint can be applied for everyone and when it moves from good to bad conditions and vice versa. For example, when moving from bad to good conditions, an individual of the LC type has the following constraints:

$$\mu_1 S^L_1 = \mu_1 (W_1 - T_1 - C^L_1) = 0$$

Where $\mu_1$ is the limitation on liquidity,$ W_1$ is the wage,$ T_1$ is the amount of tax paid in the first period,$ C^L_1$ and $S^L_1$ are the consumption and savings of the individual LC in the first period, respectively.

Finally, the consumption model should be a model that includes unpredicted components (fiscal shocks $\varepsilon_1^G$ and $\varepsilon_1^T$) and the predicted components (the predicted fiscal effects on disposable income. Therefore, the following equation is obtained:

$$\Delta c_\tau = \alpha_1 (1 - D_\tau) \varepsilon_1^G + \alpha_2 (1 - D_\tau) \varepsilon_1^T + \alpha_3 D_1 \varepsilon_1^G + \alpha_4 D_1 \varepsilon_1^T + \alpha_5 \Delta Y_a + \nu_1$$

Where $D_\tau$ is the dummy variable, which is one in bad condition, and is zero in good conditions.$ \varepsilon_1^G$ is the spending shock.$ \alpha_1$ is the effect of the spending shock on the consumption in good conditions.$ \varepsilon_1^T$ is the tax shock.$ \alpha_2$ represent the effect of the tax shock in good conditions.$ \alpha_3$ represent the effect of the tax shock in bad conditions.$ \alpha_4$ represents the impact of unpredictable changes in the disposable income private consumption. The coefficients of financial variables in good and bad conditions include effect of fiscal policy on the private consumption of individuals of type U and LC.

### 3. PRE-ESTIMATION TESTS

The Jarque–Bera test [17] is used to examine the assumption of the normal distribution of the residual. In this test, the null hypothesis represents the normal distribution of observations, and if the significance level of this test is greater than 0.05, the variable will have a normal distribution.

Pearson Correlation Coefficient: The Pearson correlation coefficient [18], also called bivariate correlation coefficient was developed by Karl Pearson (1880). This coefficient is used to determine the relationship, type, and direction of the relationship between two distances or relative variables, or a distance variable and a relative variable. In fact, this coefficient is the corresponding parameter of the Spearman’s rank correlation coefficient. Several computational methods can be used to calculate this coefficient.

In this study, the following formula is used:

$$r = \frac{n \sum x_i y_i - \sum x_i \sum y_i}{\sqrt{[n \sum x_i^2 - (\sum x_i)^2][n \sum y_i^2 - (\sum y_i)^2]}}$$

This coefficient is bounded between -1 and 1. $r = 1$ represents the direct relationship between the two variables. This positive relationship means that if one of the variables increases, the other one will also increase. $r = -1$ shows a complete inverse relationship between the two variables. The inverse or negative relationship indicates that if a variable is increased, the other variable will be reduced. If the Pearson correlation is significant and higher than 0.7, there will be a possibility of linear correlation in the model. One of the criteria required for regression estimation is stationarity of time series. According to Johansson and Julius (1990) and Pesaran-Shin (1995), if all variables are stationary at zero or one and at least one co-integration vector can be found between them, then least-squares techniques can be used.
4. Estimation of the Regression Model

Testing of the research hypotheses is done by estimating the regression model. Then, the regression model is rewritten and fitted, and the hypotheses are examined.

The regression model introduced in the previous section is as follows:

\[
\Delta c_t = \alpha_1 (1 - D_{1,t}) \varepsilon_t^G + \alpha_2 (1 - D_{2,t}) \varepsilon_t^T + \alpha_3 D_{1,t} \varepsilon_t^G + \alpha_4 D_{1,t} \varepsilon_t^T + \alpha_5 \Delta Y_{t-1} + \nu_t
\]

The following table shows the results of estimating the regression model for the indices using the ordinary least squares method.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Deviation</th>
<th>T-statistic</th>
<th>Significant level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>2025.45</td>
<td>3962.9</td>
<td>2.96</td>
<td>0.0000</td>
</tr>
<tr>
<td>((1 - D_{1,t})\varepsilon_t^G)</td>
<td>0.59</td>
<td>0.238</td>
<td>-9.56</td>
<td>0.01</td>
</tr>
<tr>
<td>((1 - D_{2,t})\varepsilon_t^T)</td>
<td>0.15</td>
<td>0.0895</td>
<td>26.86</td>
<td>0.05</td>
</tr>
<tr>
<td>(D_{1,t} \varepsilon_t^G)</td>
<td>0.29</td>
<td>0.10</td>
<td>2.98</td>
<td>0.01</td>
</tr>
<tr>
<td>(D_{1,t} \varepsilon_t^T)</td>
<td>0.123</td>
<td>0.019</td>
<td>10.01</td>
<td>0.05</td>
</tr>
<tr>
<td>(\Delta Y_{t-1})</td>
<td>0.69</td>
<td>0.002</td>
<td>12.69</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Following table presents the result of certain statistical test

<table>
<thead>
<tr>
<th>Test</th>
<th>Statistic</th>
<th>Value</th>
<th>Sig-level</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heterogeneous Variance</td>
<td>F</td>
<td>48.2</td>
<td>0.0000</td>
<td>Autocorrelation</td>
</tr>
<tr>
<td>Normality</td>
<td>F</td>
<td>11.1</td>
<td>0.0000</td>
<td>Existence of Heterogeneous Variance</td>
</tr>
<tr>
<td>Autocorrelation</td>
<td>Chi-square</td>
<td>8.26</td>
<td>0.0000</td>
<td>Non-Normality of Residual</td>
</tr>
</tbody>
</table>

By analyzing the results presented in table 2, we can conclude that there is a serial correlation in the model, its residual is not normal and also there is a heterogeneous variance. In order to simultaneously eliminate the heterogeneous variance and serial correlation that results in the non-normalization of the residual, we should use the appropriate weight in the estimate.

5. Results and Conclusion

In this study, the effect of monetary and fiscal policies on the Kuwait’s economy has been investigated based on the econometric and statistical analysis using EVIEWS software. It can be argued that specific fiscal policy which has been chosen by the Kuwait Government shows a positive and significant impact on long-term consumption. Some economists have argued that the factor of financial development can affect households’ decision regarding the allocation of their disposable income between saving and consumption [19], so right now we can argue that different kind of policies can influence individual’s decision regarding the level of their consumption and saving which will change their daily life.

As mentioned before, oil revenue is considered as one of the main source of income for Kuwait government and any fluctuation in oil prices should be analyzed. Our results propose that oil revenue variations in the business cycle have a significant impact on private consumption.

6. References


