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Oil Price Fluctuation and Individual's Decision Regarding Daily Life

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ABSTRACT

In this study, we investigate the effects of oil price fluctuation, variation in monetary and fiscal policy on individuals' decision regarding their choice of saving and consumption in Algeria following the model presented by Tagkalakis (2008). Ordinary least square method (OLS) was the chosen model for this Study. Our final results show that fluctuation in oil price has a significant influence in the consumption and saving decision of people over there.

Keywords: Oil Price Fluctuation, Monetary Shocks, Consumption and Saving.

1. INTRODUCTION

The monetary authorities of a country frequently implement monetary policy by controlling the supply of money [1]. They adjust interest rates to achieve economic growth, relative stability of prices, and unemployment reductions. Expansionary and contractionary monetary policies increase and decrease the monetary supply respectively to achieve special goals in different circumstances [2]. To deal with unemployment in a state of recession an expansionary policy reduces interest rates, attracts the trust of businessmen in expanding economic activities. expansionary monetary policy is used to deal with price inflation [3]. For example, the central bank reduces the legal reserve ratio of the amount of money by selling bonds to individuals. Reducing the amount of money by reducing the demand for trade will decrease national income and occupation and curbs inflationary pressures. Contractionary policies aim preventing the deterioration of asset values by reducing inflation [4]. Monetary policy differs from fiscal policy in that it deals with taxation, government spending, borrowing and debt, and government credibility affairs in the economy. According to previous studies, only those countries with a certain long-term plan regarding their socio-economic goals can succeed in this regard [5,6]. In fact, it can be argued that any specific policy which is chosen by government can directly or indirectly influence individual's life and change their consumption or saving behaviour [7,8]. In this study, we are interested to see how different fiscal and monetary policies can influence private consumption in Algeria. For this specific study, we are following the model presented by Tagkalakis (2008). It should be mentioned that different monetary shocks will be considered for efficiency issues.

2. METHODS AND PROCEDURE

This method, which is the most important and common least squares estimation method, is used in many sciences including mathematics, statistics, engineering, management, economics, and others for statistical analyses [9]. However, the ordinary least squares method considers an assumption that seeks to simplify the real world and is therefore far removed from the real world. This method is very useful because of simplification and simplicity of least squares estimation [10].

Here, we discuss the ordinary least squares method in detail. The regression equation is as follows:

$$Y_i = \alpha_0 X_1 + \alpha_2 X_2 + \cdots + \alpha_n X_n + U_i \quad (1)$$

By examining regression models, it is easy to see that any progress in regression analysis stops further understanding of the model error term. In fact, in a regression model, the error term plays an important role but is unknown [11]. Whenever we try to know and measure components of the error term, these components are known in the given part of the model, and the remaining set of unknown factors forms the error term. Therefore, the error term is never visible or measurable. As a result, the only way out of this theoretical constraint is to put forward a series of reasonable assumptions about the error term so that regression analysis can be continued [12]. These assumptions are based on a hypothesis about exogenous variables, known as the classical assumptions of regression models.

These assumptions are: is stochastic. In fact, this assumption states that our equation is well-fitted; if the residual is not stochastic in a regression model and, for example, it is sequential, it will be determined that some of the variables affecting the model are not considered in the model [13]. That is, the factor that leads to the sequential residual should be considered for the model estimation so that the error terms are excluded from the sequential state and become stochastic. Distribution of is normal [14]. This assumption is based on the simplicity of model analysis. If it is proved that the distribution of the error terms is not normal, the goal will be achieved by increasing the sample size. For example, if it is proved that the error terms have a Poisson distribution, the Poisson distribution becomes a normal distribution by increasing the sample size to more than 100 observations. Mathematical expectation of the error terms is equal to zero. The sum of the deviations of the points from the regression line is zero. That is, the positive and negative intervals of the points of the regression line neutralize each other. This assumption is very effective in simplifying statistical analysis of variance and covariance of regression model. This assumption means that for any given value of explanatory variables, the mean of all possible values of is zero. The emergence of different values of U is based on the assumption of the repeated hypothetical experiments for certain and constant values of explanatory variables. The general concept of this assumption is that the model has no systematic error.

The variance of is constant. In fact, this assumption implies that the variance of is equal to the variance of U1, U2, U3 etc. If the variance of the error terms is a function of the independent variable, then our model has the heteroskedastic variance. That is, we should have:

$$\partial_i^2 \neq f(x_i)$$

Different are independent of each other. That is, the covariance between is zero. It is written in mathematical language as follows:

COV (K,L)= 0

have independence from independent variables. That is, the covariance between the and the independent variables is zero. It is written in mathematical language as follows:

COV (K,L) = 0

If these assumptions are met, the ordinary least squares method will be used to fit an equation. As you can see, these assumptions are used for simplification of an equation. Therefore, their realization in a regression model is far-fetched. Considering that the main aim is to examine the role of fiscal policy in Algeria'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. The basic assumption of Tagkalakis is that the government is mainly financed by taxes. Since Algeria 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.

3. STATISTICAL TESTS

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. A time series variable is stationary when the mean, variance, and self-correlation coefficient remain constant over time. One of the most commonly used tests for stationarity is the unit root test that includes several tests, such as the Augmented Dickey-Fuller(ADF), Phillips -Perron (PP) test, Elliot-Rothenberg -Stock point optimal (ERS) test, Ng-Perron test. In this study, the Augmented Dickey–Fuller test and the PP test is used to examine the stationarity Table 1 will present the result of the stationary test for this research.

Table I Augmented Dickey–Fuller Test with One-Time Differentiation

Variable	statistics	Significance level	result
Variation in consumption	-7.88	0.0000	stationary
Fiscal policy	-6.56	0.0000	stationary
Tax Revenue	-12.68	0.0000	stationary

Considering the above argument, the following equation will be used for this specific research:

$$\Delta c_t = \alpha_1(1 - D_D)\,\varepsilon_1^G + \alpha_2(1 - D_1)\varepsilon_1^T + \alpha_3 D_1 \varepsilon_1^G + \alpha_4 D_1 \varepsilon_1^T + \alpha_5 \Delta Y_a + v_1$$

Johansson Coagulation Test

After validation of the non-stationarity and establishment of the necessary conditions, the convergence degree should be tested for examining the long-run relationships among the variables. For examining convergence, there are different tests, among which the most common ones are the Engle-Granger (1987) test, Johansson (1988) test, ARDL test, and Boundary Test. The dominant method compared to other econometric methods to determine

coagulation is Johansson's test, which is used in this study. It was pointed out that if a time series is differentiated d times to be stationary, the time series will have d unit roots and will be the order of integration d or I(d). The null hypothesis in the Johansson Coagulation Test is based on the non- coagulation of the variables. The hypotheses are as follows:

H0: The variables are not coagulated.

H1: The variables are coagulated.

The significance level should be less than 0.05 in order to reject the null hypothesis. According to the Johansson Coagulation Test, the coagulation of the variables is quite clear, and so the econometric analysis can be done.

test, Elliot-Rothenberg -Stock point optimal (ERS) test, Ng-Perron test. In this study, the Augmented Dickey–Fuller test and the PP test is used to examine the stationarity Table 1 will present the result of the stationary test for this research.

Null Hypothesis	Trace statistics	Significance level	result
Lack of long-term relation	-120.52	0.0000	Rejected
Existence of a maximum one relation	65.02	0.0000	Rejected
Existence of a maximum two relation	11.63	0.09	Confirm

Fig. 1. Johansson Coagulation Test

4. CONCLUSION

In this study, we investigate the effects of different fiscal and monetary policies on private consumption in Algeria following the model presented by Tagkalakis (2008). For this specific aim, different fiscal and monetary shocks like change in oil price, and tax revenue are studied. It can be argued that specific fiscal policy which has been

chosen by Algerian Government shows a positive and significant impact on private consumption. Available studies have argued that the factor of financial development can affect households' decision regarding the allocation of their income between saving and consumption. Government can also propose a discount policy models for consumption efficiency [15], so right now we can argue that different sort of fiscal and monetary policies which were chosen by government influence individuals decision regarding the level of their consumption and saving which will change their daily life.

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