



## Effects of Fiscal Policy on Unemployment Rate in Iraq

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### Article History

Received: 06 Sept 2022

Revised: 05 Oct 2023

Accepted: 11 Nov 2023

### Abstract

The recent rise in the Iraqi unemployment rate has led to so many macroeconomic problems that have led the government to undertake a major reform of various policies. It is essential for federal governments to upgrade their key policies, including physical policies, to stabilize the economy. This study therefore examines the effect of fiscal policy on unemployment rates. Johansen cointegration, the Unrestricted VAR method and the Granger causality test are the main analytical techniques used in the study. Results from the cointegration outcome of Johansen shows that there is no long-run relationship between the variables. While the result of unrestricted VAR system indicated that, both total government expenditure and government revenue coefficients at lag one has negative relationship with unemployment which implies increase in both government expenditure and revenue can decrease unemployment rate of Iraq with coefficients and probability values of -0.472035, -2.044219, 0.0234, and 0.342 respectively. Also taking total government expenditure (LGEXD) as dependent variable in the system equation portrays that, the coefficients of unemployment rate have negative relationship with total government expenditure and statistically significant at 5% level. While government revenue has positive effects on total government expenditure which implies as

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| <p>CC License<br/>CC-BY-NC-SA 4.0</p> | <p>government revenue increases so also expenditure increases and is statistically significant at 5%. The study therefore advises that, through expansionary fiscal policy, government can have efficient fiscal policies that can help increase aggregate demand and the pace of economic growth by reducing taxes and increasing overall government spending. Therefore, the study obviously showed that rising both government spending and income would lower unemployment rate. Since lower taxes raise disposable income and thereby help increase consumption, leading to higher aggregate demand (AD). Also, less businesses would go bankrupt with higher aggregate demand and faster economic growth, implying less job losses.</p> <p><b>Key terms:</b> <i>Fiscal policy, Total government expenditure, Government revenue, Unrestricted VAR.</i></p> |
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## 1. Introduction

For the economy of any nation to maintain stability, it cannot be left on auto-pilot. The market forces alone cannot be said to totally dictate the tone of the economy, which in turn determines the standard of living of its citizens. Fiscal policy represents not only a support, but also a swindler of the economic pendulum. All over the world, fiscal policy remains an overtly conspicuous macroeconomic tool that the government uses in regulating the economy, in line with market forces, so as to enhance stability, control unemployment and douse certain economic shocks (Algburi, Alshamarry, & Kadhim, 2020, Kadhim & Kadhum, 2020; Ubaid, 2020). In fact, countries with economic strengths are easily dictated by the strength of their fiscal policies. Fiscal policy specifically refers to the way the government engages in expenditure and taxation so as to enhance economic stability (Alshammari & Hammoud al-Jubouri, 2020). This makes it a veritable instrument that the government has to control the economic activities. In the generations past, fiscal policy merely focused on balance of the budget, stemming from the ideology that it is not ideal for the government to intervene in economic activities. Rather it should be left to be dictated by market forces. But after the advent of John Maynard Keynes' era, there was a paradigm shift in the functionality of fiscal policy, thereby becoming a tool for solving the economic problems by the government (Al-Rajhi, et al., 2014). With this government interventionist perspective of the concept of fiscal policy, Alshammari & Hammoud al-Jubouri, (2020) particularly see fiscal policy as the manner in which the government takes the planning, spending, and the avenues of financing this expenditure, as reflected in the budget. Fiscal policy in Iraq is of a particular interest because it is an oil producing country. One major challenge that some oil producing countries usually experience is allowing their fiscal policy to be wholly dependent on oil (Sarangi, et al., 2019). Unfortunately, oil is a very unstable

commodity, which is vulnerable to market fluctuations. For instance, Sarangi, et al (2019) pinpoint that Iraq's oil sector revenue has suffered a serious dwindling since the fall of price in 2014. And unfortunately, Iraq's revenue is majorly reliant on oil. Oil revenue constitutes 90% of Iraqi GDP (Al-Azzawi, Al-Shamri, & Ali, 2020). With the declining oil price, Iraqi economy is on a red alert. Al-Azzawi and colleagues particularly note that this is because of lack of diversification to agriculture, industry and other sectors.

Another major threat to Iraq's revenue is the uprising of extremists' attack which has forced the government to allocate heavy parts of the revenue to the war against extremism, and deprived investors, thereby increasing unemployment (Alshammari & Hammoud al-Jubouri, 2020). Right from the period of 1980s, Iraqi economy had always struggled, no thanks to the debilitating effect of insecurity (Looney, 2004). Consequent to the ousting of the then Islamic ruler in 2003, by western forces, the staggering Iraqi economy which had earlier been on full scale government intervention was suggested to operate a free market system, in consonance with the concept of "neoliberalism" (Looney, 2004). The "neoliberalism" was a recovery package suggested by the Coalition Provisional Authority (CPA). The objectives of the neoliberalism package included, privatization, creating space for foreign investors, and reduction of taxes (Looney, 2004). Amongst other factors, insecurity and wrong timing could not allow this program to be a success. The government then prepared for transition and, a shock therapy as the neoliberalism could not be suitable, as it rather increased unemployment. Till date, insecurity has been a major precursor on Iraqi economic instability.

Unemployment is one major factor that affects a country's GDP. According to the International Labor Organization (ILO), as articulated in Al-Azzawi, Al-Shamri, & Ali (2020) unemployment can be seen as being above the age of work but without work, despite the zeal and preparedness to work at the prevailing wages, all to no avail. It is thus deduced that not everyone looking for job is unemployed. Following the dwindling oil prices which have espoused its spirogyra effects on Iraqi economy at multi-levels, the unemployment rate has abysmally increased (Bager, et al, 2019). The public sector accounts for the majority of employment in Iraq, and consequent to the economic downturn, creating a narrowed fiscal space; the public sector employment generation got to its elastic limit (Sarangi, et al., 2019). The implication of this is obvious- many jobs are lost, thereby increasing the unemployment rate.

Amidst all these, the Iraqi government aims to create job opportunities and enhance a better livelihood for the citizenries. This can be achieved through economic diversification, and creating economic growth (Sarangi, et al., 2019). Fiscal policy remains the blueprint for this achievement. It is on this background that this work aims to find out the effect of fiscal policy on the unemployment rate in Iraq.

Our major contribution to the literature is to identify the effect of fiscal policy on unemployment rate in Iraq and to address how unemployment rate in Iraq is influenced by effective fiscal policy through total government expenditure and revenue to achieve macroeconomic objectives. The objective of this study is to empirically investigate the effect of fiscal policy on unemployment in Iraq using annual data from 1999 to 2019. The paper is organized as follows;

section two reviews the related literature, the methodology is discussed in section three, section four presents the analysis and discussion. Finally, section five concludes the study and draws policy implication.

## **2. Literature Review**

Fiscal policy has remained a hot debate among scholars in the economic field. Many researchers are deeply concerned with the level of economic growth and employment opportunities across countries of the world. It is believed that fiscal policy remains an independent variable influencing these variables either positively or negatively. Anning, Tuama, and Darko (2017) investigated the impact of inflation and unemployment on the economic growth of Iraq. The study adopted multiple regression analysis, with inflation and unemployment serving as independent variables while economic growth is the dependent variable. The data for the study was gotten from Central Bank of Iraq (CBI), on the following: inflation rate, money supply, Gross Domestic Product (GDP), unemployment, and a percentage of the total labor force, all spanning from 1990-2014. The data was analyzed using Vector Autoregressive (VAR) Model Approach. The findings from the study revealed that inflation prevents economic growth in Iraq. Inflation is largely a result of the technological use in the production and the rate of unemployment (Anning, Tuama, & Darko, 2017)

In other words, the monetary system in Iraq is not sufficiently compatible with the developing and changing system, as a result, prices increase in the market and cause inflation (Anning, Tuama, & Darko, 2017). Anning and colleagues therefore suggest that fight against the rising unemployment and inflation in Iraq should be taken seriously. More concerted efforts should be made by economic policy makers to reduce the unemployment, which in turn would reduce insecurity.

Algburi, Alshamarry, and Kadhim (2020) examined the fiscal policy sensitivity of the output gap in the Iraqi economy from 2004 to 2017. The primary objective of the study was to find out the effect of the output gap on fiscal policy in the Iraqi economy during the investigated period. The study also wanted to identify the type of fiscal policy implemented in Iraq. In order to achieve this, the potential GDP was calculated compared with the actual output so as to identify the deviation. The data used in the study was obtained from statistical publications of the Central Statistical Organization of the Ministry of Planning, and also data from the Central Bank of Iraq. Results from analysis indicate a negative relationship trend between the output gap and the government revenues and expenditures. This implies that, if the output gap increases by one unit, government revenues and expenditures change negatively and relatively. During economic boom and wealth, the government expands its spending and as well cuts tax so as to compensate for the lack of demand as a result of poor economic performance at the various non-oil sectors. In the same vein, during economic melt-down, the government adopts a contractionary fiscal policy which implies very low spending hence the oil revenue is not forthcoming (Algburi, Alshamarry, & Kadhim, 2020). Overall, the study revealed that the type of fiscal policy that existed in Iraq at the period of the study was automatic fiscal policy, contrary to the discretionary fiscal policy. This is

basically because of its sole dependence on oil. This in turn brings about unemployment as it continues to sideline the non-oil sectors which would have boosted and generated employment.

The automatic fiscal policy also known as automatic stabilizers includes the changes that occur in the revenues and spending as a result of the changes that occur in the economic cycles, which are unrelated to changes in legislation (Carpoli, Romanelli & Tommasino, 2017). Proponents of the automatic fiscal policy which Furman (2016) refers to as the Old View, argue that fiscal policy should not be left in the hands of government because it can be adversely affected by political changes in government. Also, it is argued that decisions are not usually implemented exactly (Carpoli, Romanelli & Tommasino, 2017). It is therefore argued that the neutrality of monetary policy is better for economic stability. However, as noted by Carpoli, Romanelli & Tommasino (2017) many of the European countries who practiced the automatic stabilizer at the expense of discretionary policy could not easily overcome their economic shocks, thus suggesting that the mixture of both automatic stabilizer and the discretionary policy could be better.

According to Ayeb (2010), discretionary fiscal policy means structural changes, based on discretion, which reflect a conscious and deliberate change in key elements of spending or tax revenue systems; deal appropriately with issues regarding economic cycles or disturbances by changing the base of spending or tax. This implies that if a country like Iraq which its major revenue is directly coming from oil, experiences low oil price; instead of completely cutting spending, they should restructure spending by compensating revenue from a functional non-oil sector. And this is done through legislation. The discretionary fiscal policy is more useful in stabilizing the economy during economic shocks (Caprioli, Romanelli & Tommasino, 2017). According to them, discretionary is more or less legislations from the government. In specific terms discretionary fiscal policy represents “the change in the budget balance due to changes in the fiscal legislation” (Caprioli, Romanelli & Tommasino, 2017, p.7).

Kadhim and Kadhum (2020) examined the role of fiscal and monetary policies in attracting the domestic and foreign direct investment in Iraq from 2004 to 2018. The independent variables are the monetary policy which includes obligatory reserve, rediscount rate, and open market operation; and the fiscal policy which includes government capital expenditures and taxation. The data were obtained from the Central Bank of Iraq. The dependent variables of the study are domestic investment which involves the expenditure on fixed capital goods and change in the inventory; and foreign direct investment meaning the amount of international investment in equity (Kadhim & Kadhum, 2020). The study used multi linear regression technique in order to detect the effect of the independent variables on the dependent variables. After the analysis, the following findings were found: first, the relationship between domestic investment and the outstanding balance of certificate is positive. Second, the relationship between domestic investment and the rediscount rate is positive. Also, the study found out that the relationship between domestic investment and taxes is negative. Again, the study found that the relationship between the government capital expenditure and domestic investment is negative. This implies that the government expenditure does not really reflect on domestic investment. Similarly, the

study revealed that the relationship between foreign direct investment and the outstanding balance certificate of deposit is positive.

Another remarkable finding from Kadhim and Kadhum (2020) is that there is a significant relationship between cash reserve and foreign direct investment, meaning that obligatory cash reserve is a useful tool in increasing the foreign direct investment. It is also discovered that government expenditure within the period of this study did not really encourage foreign direct investment. The implication is that more job spaces are not being created. However, this study did not specifically mention how the fiscal policy affects unemployment.

According to Awad and Kadhem (2018), government support policies for the individual income in Iraq for the period of 2003 to 2016. Government support can be seen as part of the fiscal policy. Government support represents a stream of spending where the state decides to pay without corresponding to the stream of goods and services (Awad & Kadhem, 2018). The study by Awad and Kadhem is basically qualitative, as it only made review of previous works, extracting the relevant data there in. The study concluded that the government support in Iraq has not balanced with economic realities, as it has distorted economic effects on the performance of the general budget. The supports have not synchronized with changes in operating and usage policies. The recourse to foreign and domestic borrowing was as a result of the failure of the government support policies (Awad & Kadhem, 2018). It is on the basis of this failure that the authors recommend that the government gradually abandon the excessive adoption of social policies at the expense of economic policies. An implicit revelation from this study is that there is no clear distinction between government support policy and economic policy (fiscal policy) in Iraq. And unfortunately, the concentration on the support policies does not create jobs, thereby increasing the rate of unemployment in Iraq.

Omran and Bilan (2020) conducted a study on the impact of fiscal policy on the unemployment rate in Egypt. The objective of the study was to find out how unemployment rate responds to fiscal policy shocks. The study used time series data for the periods of 1976-2018 obtained from World Bank and international monetary fund. The study made use of a five variables structural vector autoregressive (SVAR) model alongside impulse response function (IRF) tool. After the analysis, the following findings were reached at: first, a positive shock on the government spending has a negative effect on the unemployment rate. Second, a positive shock to tax revenue has a positive impact on the unemployment rate. In simple terms, the above finding means that when the government increases its spending, the unemployment rate is reduced. But an increase in tax revenue increases the unemployment rate. It is on this background that Omran and Bilan (2020) recommend that for Egypt to reduce the unemployment rate, they should embark on expansionary budget. However, these findings reject that of Alhamdany and Obaid (2020), who investigated the effect of money supply on unemployment in Iraq; and came to the conclusion that money supply does not have a balance relationship with unemployment. That is to say aside other factors, increase in money supply does not necessarily bring about decrease in unemployment rate. But unlike Omran and Bilan (2020), the variable money supply in



Alhamdany and Obaid (2020) is more or less a monetary policy instead of a purely fiscal policy. The outcome of the present research will throw more light on this disparity.

Sarangi et al (2019) on their study of the macro-fiscal policy toward economic diversification and employment generation in Iraq, acknowledged that Iraq is currently encumbered with certain debilitating economic challenges such as high unemployment rate of the youth, weak employment opportunities for highly educated youth, weak private sector, low productivity of non-oil sectors and low education level of great number of the unemployed youth. It is on this background that the researchers recommend that appropriate policy measures should be put in place since economic diversification and employment generation are reliant on fiscal policy. However, it is expedient that any policy reform is backed with evidence-based analysis, in line with both the short and long terms pros and cons of these measures (Sarangi, et al. 2019).

Al-taie et al (2017) worked on the role of tax revenue development and its reflection on the public revenues of the developing countries, using Iraq as a case study. The study used data spanning between 2004 and 2014. The study revealed that tax burden often negatively affects developing countries, as it encourages capital outflows. While tax burden may impact positively on developed countries, it does not yield enough positive results in the developing countries. The researchers emphasized that taxes help to boost the budgetary implementation and should not be overlooked. While the researchers acknowledge that there are positive effects of tax burdens, they maintained that it pays off more for the rich developed countries. All these literature have however not given peculiar attention to the components of fiscal policy in comparative terms. This concerned is addressed by the present study.

### 3. Methodology

The research uses a quantitative approach by analyzing secondary time series data from macro trends data and the public spending review of the Republic of Iraqi, using Johenson cointegration analysis and unrestricted autoregression equation.

#### Model Specification

The model for this study focuses on the effect of fiscal policy on unemployment rate in Iraq from 1990 to 2019.

The model specification is as follows:

The functional relationship is given as

$$UEMR=f(GEXD, GRVN)$$

The research aims to determine the effect of fiscal policy on unemployment rate in Iraq from (1990-2019), the dependent variable of the research work is the unemployment rate (LUEMR) whereas the independent variables are; total government expenditure (LGEXD) and government revenue (LGVRN).

The econometric relationship to be estimated is specified as:

$$\text{LUEMR} = \beta_0 + \beta_1 \text{LGEXD} + \beta_2 \text{LGVRN} + U_t \dots\dots\dots (1)$$

Where:

LUEMR= Unemployment rate

LGEXD= Total government expenditure

LGGVRN= Government revenue

The study uses such descriptive statistics as mean, median, minimum range, maximum range, and standard deviation for a statistical description of the identified variables. Also, Johenson cointegration analysis and unrestricted autoregression equation are used in finding out the long term relationship between the variables.

### Unit Root Test

Unit root test is being conducted using Philips Perron approach to determine the stationarity conditions as well as the order of integration of the variables in this study. The PP test specification of the unit root test (intercept and trend included) for each variable are presented as follows:

$$\Delta \text{LUEMR}_t = \beta_1 + \beta_2 t + \beta_3 \text{LUEMR}_{t-1} + \sum_{i=1}^m \alpha_i \Delta \text{LUEMR}_{t-1} + u_t \dots\dots\dots (2)$$

$$\Delta \text{LGEXD}_t = \beta_1 + \beta_2 t + \beta_3 \text{LGEXD}_{t-1} + \sum_{i=1}^m \alpha_i \Delta \text{LGEXD}_{t-1} + u_t \dots\dots\dots (3)$$

$$\Delta \text{LGRVN}_t = \beta_1 + \beta_2 t + \beta_3 \text{LGRVN}_{t-1} + \sum_{i=1}^m \alpha_i \Delta \text{LGRVN}_{t-1} + u_t \dots\dots\dots (4)$$

Where:

$\Delta$  = First difference operator of the variables,

$t$  = time or trend taking the value of 1, 2, till the end of the sample and

$u_t$  = white noise error term.

### Johansen Cointegration Model

An  $n \times 1$  vector time series  $\psi_t$  is said to be cointegrated of order  $(p, q)$ ,  $CI(p, q)$  where  $0 < q < p$ , if each of its component series  $\psi_{it}$  is  $I(p)$  but some linear combination  $\pi' \psi_t$  is  $I(p-q)$  for some constant vector  $\pi \neq 0$ .

If the  $n \times 1$  vector time series  $\psi_t$  contains more than 2 components, each being  $I(1)$ , then there may exist  $k$  ( $< n$ ) linearly independent  $1 \times n$  vectors which is cointegrating matrix vector or long-run parameter.

$$\text{The model is as thus: } \text{LUEMR} = \beta_0 + \beta_1 \text{LGEXD} + \beta_2 \text{LGVRN} + U_t \dots\dots\dots (1)$$

Where:

LUEMR= Unemployment rate

LGEXD= Total government expenditure

LGGVRN= Government revenue



### Unrestricted Vector Autoregressive Model

For the analysis of multivariate time series, the vector autoregression (VAR) model is one of the most efficient, scalable, and easy to use models. This is a natural extension to the complex multivariate time series of the univariate autoregressive model. The VAR model has proven to be particularly useful for explaining and for forecasting the complex behavior of economic and financial time series. The type has the basic p-lag vector autoregressive model [VAR (p)]. The VAR model is quite suitable for this study because it uses time series data. And the VAR would help to ascertain the level of the relationship between the variables along the years of interest. Again, VAR has proven to be reliable and statistically sound.

$$\Theta_t = c + \lambda_1 \Theta_{t-1} + \lambda_2 \Theta_{t-2} + \dots + \lambda_p \Theta_{t-p} + \varepsilon_t, t = 1, \dots, T \quad (5)$$

Where  $\lambda_i$  are  $(n \times n)$  coefficient matrices and  $\varepsilon_t$  is an  $(n \times 1)$  unobservable zero mean white noise vector process (serially uncorrelated or independent) with time invariant covariance matrix  $\Sigma$ .

### Granger causality test

A variable  $x$  is said to Granger cause another variable  $y$  if past values of  $x$  help predict the current level of  $y$  given all other appropriate information.

The granger causality test in relation to this research work is given as follows:

$$LUEMR = \sum \beta_1 LUEMR_{t-1} + \sum \beta_2 LGEXD_{t-1} + \sum \beta_3 LGRVN_{t-1} + \varepsilon_t \quad (6)$$

$$LGEXD = \sum \delta_1 LUEMR_{t-1} + \sum \delta_2 LGEXD_{t-1} + \sum \delta_3 LGRVN_{t-1} + \varepsilon_t \quad (7)$$

$$LGRVN = \sum \phi_1 LUEMR_{t-1} + \sum \phi_2 LGEXD_{t-1} + \sum \phi_3 LGRVN_{t-1} + \varepsilon_t \quad (8)$$

## 4. Discussion and Results

### 4.1 Stationarity Tests

The stationery test of the variables of interest is necessary, and it is done in consonance with Johansen co-integration thus:

**Table 1 Phillips-Perron Test Result**

| Variables | PP t-statistics | Critical Values (5%) | Prob   |
|-----------|-----------------|----------------------|--------|
| D(LUEMR)  | -4.47178        | -2.97185             | 0.0015 |
| D(LGEXD)  | -4.52621        | -2.97185             | 0.0013 |
| D(LGRVN)  | -5.132165       | -2.97185             | 0.0003 |

(Source: Collected data from the Central Bank of Iraq, Statistics and Research Department, Annual Bulletin of Selected Years website [www.cbi.iq](http://www.cbi.iq))

Based on the result of the unit root test, log of unemployment, total government expenditures and government revenue was found to be stationary at first difference as their Philips Perron t-statistic value -4.47178, -4.52621 and -5.132165 is greater than the critical value at 5% level of significance as well as their probability. Thus they are integrated of order one I(1).

**Table 2. Descriptive Statistics**

|                  | <b>D(LUEMR)</b> | <b>D(LGEXD)</b> | <b>D(LGRVN)</b> |
|------------------|-----------------|-----------------|-----------------|
| <b>Mean</b>      | 2.234575        | 11.29036        | 9.774927        |
| <b>Median</b>    | 2.198890        | 11.22725        | 9.661089        |
| <b>Maximum</b>   | 2.566487        | 12.60964        | 11.88715        |
| <b>Minimum</b>   | 2.075684        | 10.26987        | 7.740230        |
| <b>Std. Dev.</b> | 0.128871        | 0.598268        | 1.440865        |
| <b>Skewness</b>  | 1.582866        | 0.658391        | 0.053781        |
| <b>Kurtosis</b>  | 4.540727        | 2.739526        | 1.368374        |
| <b>Sum</b>       | 67.03725        | 338.7108        | 293.2478        |

Source: Central Bank of Iraq (CBI) as culled from Kashcool, Buheet, and Mohammad (2018); Alshammari and Hamoud al-Jubouri

The descriptive result indicated that LUEMR has a mean value of 2.23, while LGEXD, and LGRVN, have 11.290, 9.7749, respectively. LUEMR has a median value of 2.1988, LGEXD with 11.227, LGRVN 9.6610, respectively. The standard deviation from the table shows that LUEMR, LGEXD, and LGRVN have approximately a standard deviation of 0 and 1 which shows that, they are between 0 and 1 far from the sample mean. In terms of skewness, LUEMR, LGEXD and LGRVN are normally distributed with asymmetric around its mean and are positive skewness which implies long right tail with higher values than the sample mean. LUEMR, LGEXD and LGRVN are leptokurtic with a peak curve with higher values than the sample mean.

#### 4.2 Johansen Cointegration Test

Table 3 shows that the trace as well as the Eigen-value show no cointegration among the variables under study at 5% (0.05) significance level. The (\*) represents the rejection of the null hypothesis of no cointegration at the 5% significance level. This implies that the null hypothesis of no cointegration is accepted. This shows the implication for the absence of long-rung association among the variables up to third null hypothesis which implies that, the series are not related and cannot be combined in a linear form. This validate the application of unrestricted vector autoregression technique for the analysis.

**Table 3: Johansen Cointegration Test**

| <b>H0: No. of CE</b> | <b>Eigenvalue</b> | <b>Trace Statistics</b> | <b>0.05 Critical</b> |        |
|----------------------|-------------------|-------------------------|----------------------|--------|
| <b>Prob. **</b>      |                   |                         |                      |        |
| <b>(S)</b>           |                   | <b>Value</b>            |                      |        |
| None                 | 0.444747          | 20.56960                | 29.79707             | 0.3850 |

|           |                    |         |          |
|-----------|--------------------|---------|----------|
| At most 1 | 0.136084<br>0.8956 | 4.09631 | 15.49471 |
| At most 2 | 1.72E-05<br>0.9841 | 0.00048 | 3.841466 |

(Source: Collected data from the Central Bank of Iraq, Statistics and Research Department, Annual Bulletin of Selected Years website [www.cbi.iq](http://www.cbi.iq))

Table 4 indicated that, both total government expenditure and government revenue coefficients at lag one has negative relationship with unemployment. This implies that increase in both government expenditure and revenue can decrease unemployment rate of Iraq with coefficients and probability values of -0.472035, -2.044219, 0.0234, and 0.342 respectively.

**Table 4 VAR Estimated system Equations**

| Equation Functions | Coefficients | Std. Error | t-statistics | Prob   |
|--------------------|--------------|------------|--------------|--------|
| C(1)               | 0.963972     | 0.212091   | 4.545077     | 0.0000 |
| C(2)               | -0.232844    | 0.232186   | -1.002838    | 0.3198 |
| C(3)               | -0.472035    | 0.217768   | -2.167607    | 0.0234 |
| C(4)               | 0.003323     | 0.030874   | 0.107622     | 0.9146 |
| C(5)               | -2.044219    | 3.146246   | -0.649732    | 0.0342 |
| C(6)               | 0.033693     | 0.042161   | 0.799144     | 0.4272 |
| C(7)               | -0.255092    | 0.279799   | -0.911697    | 0.3654 |
| C(8)               | -2.867692    | 1.734321   | -1.653495    | 0.0455 |
| C(9)               | -0.006637    | 1.865977   | -0.003557    | 0.9972 |
| C(10)              | 0.913111     | 0.230323   | 3.964480     | 0.0002 |
| C(11)              | -0.001366    | 0.248119   | -0.005506    | 0.9956 |
| C(12)              | 0.91311      | 0.230323   | 3.964480     | 0.0002 |
| C(13)              | 0.233131     | 0.338831   | 0.688044     | 0.4940 |
| C(14)              | -1.156089    | 2.248628   | -0.514131    | 0.6090 |
| C(15)              | 2.362340     | 0.998716   | 2.365376     | 0.0211 |
| C(16)              | -0.927882    | 1.093337   | -0.848669    | 0.3993 |
| C(17)              | 2.924321     | 1.426212   | 2.050411     | 0.0466 |
| C(18)              | 0.171027     | 0.145381   | 1.176404     | 0.2439 |
| C(19)              | 0.472035     | 0.217768   | 2.167607     | 0.0340 |
| C(20)              | -0.140349    | 0.198532   | -0.706932    | 0.4822 |
| C(21)              | 2.831689     | 1.317545   | 2.149216     | 0.0355 |

(Source: Collected data from the Central Bank of Iraq, Statistics and Research Department, Annual Bulletin of Selected Years website [www.cbi.iq](http://www.cbi.iq))

**Unemployment Equation:**

$$\text{LUEMR} = \text{C}(1) * \text{LUEMR}(-1) + \text{C}(2) * \text{LUEMR}(-2) + \text{C}(3) * \text{LGEXD}(-1) + \text{C}(4) * \text{LGEXD}(-2) + \text{C}(5) * \text{LGRVN}(-1) + \text{C}(6) * \text{LGRVN}(-2) + \text{C}(7).$$

**Government Expenditure Equation:**

$$\text{LGEXD} = \text{C}(8)*\text{LUEMR}(-1) + \text{C}(9)*\text{LUEMR}(-2) + \text{C}(10)*\text{LGEXD}(-1) + \text{C}(11)*\text{LGEXD}(-2) + \text{C}(12)*\text{LGRVN}(-1) + \text{C}(13)*\text{LGRVN}(-2) + \text{C}(14).$$

**Government revenue Equation:**

$$\text{LGRVN} = \text{C}(15)*\text{LUEMR}(-1) + \text{C}(16)*\text{LUEMR}(-2) + \text{C}(17)*\text{LGEXD}(-1) + \text{C}(18)*\text{LGEXD}(-2) + \text{C}(19)*\text{LGRVN}(-1) + \text{C}(20)*\text{LGRVN}(-2) + \text{C}(21).$$

Also from the coefficients of total government expenditure equation of C(8) and C(12) portrays that, the coefficients of unemployment rate has negative relationship with total government expenditure (as a dependent variable) as is statistically significant at 5% level. While government revenue has positive effects on total government expenditure which implies as government revenue increases so also expenditure increases and is statistically significant at 5% (see Table 4).

From the pairwise granger causality result (see Table 5), it shows that, a uni-directional causality running from total government revenue (LGRVN) to unemployment (LUEMR) taking into consideration their probability values at 5 percent significance level. Also, no causality between total government expenditure (LGEXD) and unemployment (LUEMR). Also, unidirectional causality exists between LGEXD and LGRVN.

**Table 5 Pairwise Granger Causality Test**

| <b>Variables /Hypothesis (variables does not granger cause each other)</b> |              |             |
|----------------------------------------------------------------------------|--------------|-------------|
|                                                                            | F-statistics | Probability |
| LGRVN does not Granger Cause LUEMR                                         | 3.31307      | 0.0544      |
| LUEMR does not Granger Cause LGRVN                                         | 2.05299      | 0.1512      |
| LGEXD does not Granger Cause LUEMR                                         | 1.32672      | 0.2849      |
| LUEMR does not Granger Cause LGEXD                                         | 0.02301      | 0.9773      |
| LGEXD does not Granger Cause LGRVN                                         | 2.69217      | 0.0490      |
| LGRVN does not Granger Cause LGEXD                                         | 0.37106      | 0.0341      |

(Source: Collected data from the Central Bank of Iraq, Statistics and Research Department, Annual Bulletin of Selected Years website [www.cbi.iq](http://www.cbi.iq))

**Conclusion**

This study examined the effect of fiscal policy on unemployment in Iraqi from 1990 to 2019. The research used descriptive statistical analysis, Johansen cointegration, unrestricted vector autoregression (system equations) and granger causality test for the analysis. From the Johansen cointegration result, it's clearly showed the absence of long-run association among the variables. While the result of unrestricted VAR system indicated that, both total government expenditure and government revenue coefficients at lag one has negative relationship with unemployment which implies increase in both government expenditure and revenue can decrease unemployment rate of Iraq with coefficients and probability values of -0.472035, -2.044219, 0.0234, and 0.342 respectively. Also taking total government expenditure (LGEXD) as dependent variable in the system equation portrays that, the coefficients of unemployment rate have negative relationship

with total government expenditure and statistically significant at 5% level. While government revenue has positive effects on total government expenditure which implies as government revenue increases so also expenditure increases and is statistically significant at 5%. Finally, Granger causality result showed that, a uni-directional causality running from total government revenue (LGRVN) to unemployment (LUEMR) taking into consideration their probability values at 5 percent significance level. Also, no causality between total government expenditure (LGEXD) and unemployment (LUEMR). Also, unidirectional causality exists between LGEXD and LGRVN.

The research recommends that, in line with the results of this study, government should have effective fiscal policies that can help increase aggregate demand and the pace of economic growth through expansionary fiscal policy, including tax cuts and growing overall government spending.

Therefore, the study clearly indicates that increase in both government expenditure and revenue would reduce the rate of unemployment. Lower taxes raise disposable income would help to increase consumption, leading to higher aggregate demand (AD). There will be an improvement in actual GDP with an increase in AD (as long as there is spare capacity in the economy). If more companies are established, demand for jobs will rise and, thus, demand-deficient unemployment will be lower. Also, less companies would go bankrupt with higher aggregate demand and solid economic growth, ensuring less job losses.

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