



## Economic Growth and Income Inequality: The Role of Fiscal Policy, .Iraq as an example for the period of 2004-2019

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### Abstract

Generally economic growth tends to lower inequality in the economy. The objective of this article is to determine the role of fiscal policy on inequality throughout economic growth. Iraq for the period of (2004-2019) has been chosen. Gross domestic production (GDP), Government expenditure (G.EXP), Poverty, and ISIS variables have been considered to model this article. Two models have been applied. The first one; is the model of the effect of G.EXP and ISIS on GDP by using the ARCH model. The result shows that G.EXP has a positive impact on economic growth. The second model is to examine the effect of GDP on Poverty by using the ARDL model. The result shows that GDP has a negative relationship with poverty as GDP increase poverty tends to decrease. The impacts of previous economic growth have more effect on poverty. It is anticipated that G.EXP decrease and GDP increases for the period of 2020 to 2025. It is recommended that government has to take immediate action to lower the rate of poverty and lessen the income distribution inequality in economy and reconstruct the harmed area by war to return migrated people to their original place. Increase the investment expenditure. Further study is needed with different and longer time interval and other relative variables related to this topic and using different methods for econometric models.

**Keywords:** Economic growth, inequality, fiscal policy, poverty, ISIS, ARCH, ARDL, forecasting.



## Introduction:

The ultimate goal of economic system in any country, territory, entity, and individual is the profit maximization in their choice and actions (Samuelson, Paul Anthony; Nordhaus, 2010). The perspective of profit is different from country to individual. But the initiative meaning is the same for all, which is the maximum satisfaction from the trade-off between what is being given up and what is being got. The profit maximization for a country is to provide the best level of welfare to its society by rational direction and use for its resources. This will be done by proceeding best economic policy actions.

In order to measure the level of welfare, or what has been got from what has been given up, is by measuring the growth in the national income (Gross domestic Production; GDP) which is so called economic growth. There are many theories in the macroeconomics that attempt to explain the growth procedure in the economy, for instance; Harrod-Domar, Solow, Meade, Kaldor, and AK models (Mankiw, 2013; Keita, 2018; Gallardo Pérez, Vergel Ortega and Cordero Díaz, 2019).

Those policies that aim to sustainable economic growth, which are instruments for economic growth, are two; monetary and fiscal policy. Each has its own instruments to achieve its goal. Monetary policy's instruments are interest rate, money supply, discount window, and open market operation. Fiscal policy instruments are taxation and government expenditure (Araújo, 2007; NADAR, 2013). Regarding to the last one, which is the topic of this paper, each is used in the level of which serves in a specific situation and condition in the economy; for instance, when the economy is in depression the expansionary strategy by increasing government expenditure or decreasing tax ratio or both are used in order to stimulate the economy, and when economy is overheated contractionary policy is used which is the reverse of the first one (Mankiw, 2018).

Besides the economic growth, those policies aim to achieve other goals like supporting a particular sector, for example; giving subsidies to the agriculture sector to enhance domestic production or a specific class of population with aim of redistributing income for the purpose of lowering income inequality in society. Based on Bailey (1995) there is a positive relationship between the low standard of living and poor health, which may affect mortality rate and labour market. Because of that income and wealth distribution is important. Thus, achieving equality in society is as important as economic growth. A country may have desired economic growth but may not have equality.

Republic of Iraq like any other country aims to achieve sustainable growth and increase income equality distribution. After 2003 Iraq has seen a noticeable increase in its growth rate of 53% and almost 14% increment in real GDP for 2004 and 2012 respectively (World Economic Outlook Database, 2020). The Poverty rate (as one of the indicators for income inequality) has declined from 23.57% to 19.82% from 2007 to 2012 respectively and the percentage of government expenditure to its GDP for those two years is 46% and 42% respectively (Organization for Statistics and Information Technology, 2012; World Economic Outlook Database, 2020).

**Research Importance:** Based on what was mentioned previously, we conclude that fiscal policy can affect income inequality. The higher the rate of inequality, poverty rate as an indicator, the higher the gap between social classes and can be interpreted as the ineffectiveness of the economic policies, including fiscal policy, in Iraq, where the spending more than 42% of GDP to achieve sustainable economic growth and facing income inequality was and still one of the most important goals of Iraqi government policy.

**Research Aim:** of this article is to reveal the effectiveness of fiscal policy to face the social phenomena of poverty in the republic of Iraq from 2004 to 2019 that is the proxy of income inequality. **Research Problem:** It lies in the following question; did the tried fiscal policy by the Iraqi government during the period 2004-2019 have an effect in reducing poverty rate in the country?

**Research Hypothesis:** Based on the Economic theory, if the government implies the right fiscal policy the rate of inequality will be decreased (Araújo, 2007), there is a negative relationship between the poverty rate and a right fiscal policy implementation throughout the economic growth. To test this hypothesis, data on economic growth, poverty rate, and the rate of government expenditure will be gathered. The upcoming sections to answer these questions are the literature review for previous studies, methodology, result, discussion, and conclusion.



## 2. Literature Review:

In this section previous studies which have been carried out about the fiscal policy and its role in facing inequality are being introduced. Giving most recent empirical research, by using various methods and samples that conducted this topic in order to reveal the fact that fiscal policy is capable to decrease the rate of poverty and inequality or not.

Ebady and Kadem, (2012) in their empirical study of (The Role of Fiscal Policy in the Iraqi Economy for the Period 1991-2009) they used Tax and Government expenditure as a leading tool for economic growth which it is represented by income per capita growth. In their finding, they mentioned that tax was not affective tool or instrument to participate in economic growth while the public expenditure was very effective. However, there study was a descriptive study for historical data.

Oduola (2017) Africa remains the second most unequal region globally after Latin America and the Caribbean region. Fiscal policies play important roles in reducing poverty and inequality through such instruments as taxes, transfers and government spending. Countries with high fiscal space tend to have lower poverty rates than those with lower tax revenue to GDP ratios. Indeed, fiscal space alone tends to account for 16.5 percent of changes in poverty reduction. Institutions play an important role in increasing fiscal space in Africa. Countries with increasing participatory, transparent and accountable budgetary process tend to have stronger impact of fiscal space on poverty and inequality reduction. Although 29 countries recorded declines in the distributional effectiveness of their fiscal policies over time, the distributional impact rose by 35 percent or more in countries such as Angola, Mozambique, South Africa and Togo. This paper calls for enhancing the non-extractive revenues by diversifying revenues sources from the extractive sectors and improving progressive taxation in countries with high fiscal space and high income inequality. Heavy investment in quality and accessible education and health services, and social programs are also vital to reduce poverty and inequality in Africa.

author: [{"dropping-particle": "", "family": "Oduola", "given": "Ayodele", "non-dropping-particle": ""}], parse-names: false, suffix: ""}], container-title: "African Development Review", id: "ITEM-1", issued: {"date-parts": [{"2017}], "page": "1-14", "title": "Fiscal Space, Poverty and Inequality in Africa", "type": "article-journal", "volume": "29", "uris": [{"http://www.mendeley.com/documents/?uuid=64129f97-1619-46b2-9018-016ad610e84c"}]}, mendeley: {"formattedCitation": "(Oduola, 2017 in his empirical study for (Fiscal space, Poverty and Inequality in Africa) for the period of 1990 to 2015 by taking 29 African countries as a sample, concluded that fiscal policies have a vital role in reducing the rate of inequality and poverty. Countries with lower tax revenue to GDP have a higher rate of poverty compared to countries with high fiscal space. Poverty and inequality reduction are highly influenced by increasing participatory, transparent and accountable budgetary processes. The study calls for heavy investment in quality and accessible health and education services. Countries have to enhance non-extractive revenues by revenue source diversification. The taxation progresses in countries with high fiscal space and high income inequality have to be improved.

Bander, Raja and Kadhmi (2018) in their study 'The effect of Monetary and Fiscal policy on economic growth in Iraq for the period of 1980-2016' their aim were to reveal the effect of these two policies on the economic growth in Iraq. They used time series data and VAR model to estimate the coefficients for public expenditure, money supply, and exchange rate. Their results show that, these two policies are effective in positive manner and monetary policy is more effective than fiscal policy.

In the empirical study of (Does trade openness and fiscal policy affect inequality and economic growth?) in Indonesia by Khusaini, Wahyudi, and Utama (2018) government spending on infrastructure and health proved to encourage growth. On the other hand, education sector spending and tax collection can actually hamper growth.

author: [{"dropping-particle": "", "family": "Khusaini", "given": "Mohammad", "non-dropping-particle": ""}], parse-names: false, suffix: ""}], [{"dropping-particle": "", "family": "Wahyudi", "given": "Setyo T R I", "non-dropping-particle": ""}], parse-names: false, suffix: ""}], [{"dropping-particle": "", "family": "Utama", "given": "Zamrud SISWA", "non-dropping-particle": ""}], parse-names: false, suffix: ""}], container-title: "Regional Science Inquiry", id: "ITEM-1", issue: "2", issued: {"date-parts": [{"2018}], "page": "215-226", "title": "DOES TRADE OPENNESS AND FISCAL POLICY AFFECT INEQUALITY AND ECONOMIC GROWTH? A STUDY IN INDONESIA", "type": "article-journal", "volume": "X", "uris": [{"http://www.mendeley.com/documents/?uuid=d10af6c3-956c-4bb4-b2d2-dae1a51eb59f"}]}, mendeley: {"formattedCitation": "(Khusaini, Wahyudi and Utama, 2018 for the time interval of 1980 to 2015; the error correction model approach has been used for analysing the data. Results show that fiscal policy only by using tax collection will lead to the reduction in the rate of inequality but for temporary. The effort of the government to overcome inequality by



subsidies/transfers is not reliable. They proposed that budget allocation for infrastructure and health development will lead to promoting economic growth.

The study of Aye, Clance, and Gupta (2019) labour earnings, consumption and total expenditure inequality as well as economic uncertainty. Our analysis is based on the impulse responses from the local projection methods that enable us to recover a smoothed average of the underlying impulse response functions. The results show that both contractionary monetary and fiscal policies increase inequality, and in the presence of relatively higher levels of uncertainty, the effectiveness of both policies is weakened. Thus, pointing to the need for policy-makers to be aware of the level of uncertainty while conducting economic policies in the U.S.”author”:[{“dropping-particle”:,“family”:”Aye”,”given”:”Goodness C.”,”non-dropping-particle”:,“parse-names”:false,”suffix”:,“dropping-particle”:,“family”:”Clance”,”given”:”Matthew W.”,”non-dropping-particle”:,“parse-names”:false,”suffix”:,“dropping-particle”:,“family”:”Gupta”,”given”:”Rangan”,”non-dropping-particle”:,“parse-names”:false,”suffix”:,“container-title”:”Quality and Quantity”,”id”:”ITEM-1”,”issue”:”1”,”issued”:[{“date-parts”:[{“2019”}],“page”:”283-295”,”publisher”:”Springer Netherlands”,”title”:”The effectiveness of monetary and fiscal policy shocks on U.S. inequality: the role of uncertainty”,”type”:”article-journal”,”volume”:”53”},“uris”:[“http://www.mendeley.com/documents/?uuiid=7dcca059-ebf9-4cb4-8e69-b9f598fd09ca”]}],“mendeley”:[{“formattedCitation”:(Aye, Clance and Gupta, 2019, the effect of monetary and fiscal policy on inequality conditioned on low and high uncertainty has been examined. U.S. quarterly time-series data, for a time period of 1980 to 2008, on different measures of income, labour earnings, consumption and total expenditure inequality, as well as economic uncertainty are conducted in the study. The coefficients have been estimated by using the method of local projection. The results show that both contractionary monetary and fiscal policies increase inequality, and in the presence of relatively higher levels of uncertainty, the effectiveness of both policies is weakened. Thus, pointing to the need for policy-makers to be aware of the level of uncertainty while conducting economic policies in the U.S.

Michálek and Výboštok (2019) including economic growth and the distribution of its effects. This article aims to classify European Union (EU) studied the ability of the European Union to handle the challenges of economic growth for the period of 2005 to 2015 by using the model of Bourguignon (Poverty-Growth-Inequality Triangle-PGI) and the Growth Incidence Curve. The result reveals that economic growth has a connection with the decrease of poverty however, as income inequality raises the poverty rate also increases. Furthermore, their economic growth has not been accompanied by a reduction in inequality levels; rather, these issues have risen, resulting in a growing prevalence of poverty.

Apergis (2020) when inequality is affected by fiscal policy. Using a two-stage probit least squares method and a panel of 21 countries, spanning the period 1971–2017, the findings indicate that inequality impacts the probability of banking crises through budget deficits, followed by government expenses.”author”:[{“dropping-particle”:,“family”:”Apergis”,”given”:”Nicholas”,”non-dropping-particle”:,“parse-names”:false,”suffix”:,“container-title”:”Applied Economics Letters”,”id”:”ITEM-1”,”issue”:”00”,”issued”:[{“date-parts”:[{“2020”}],“page”:”1-5”,”publisher”:”Routledge”,”title”:”The role of fiscal policy in the link between income inequality and banking crises”,”type”:”article-journal”,”volume”:”00”},“uris”:[“http://www.mendeley.com/documents/?uuiid=ac8b6fe7-522e-4d4a-8537-b68b5dc914cc”]}],“mendeley”:[{“formattedCitation”:(Apergis, 2020 in the study of (The role of fiscal policy in the link between income inequality and banking crises), explores the link between income inequality and banking crises, when inequality is affected by fiscal policy. Using a two-stage probit least squares method and a panel of 21 countries, spanning the period 1971–2017, the findings indicate that inequality impacts the probability of banking crises through budget deficits, followed by government expenses. The findings signify the role of fiscal variables as an effective tool through well-targeted programs that champion greater access for the poor. It is critical for policymakers to expand the social safety net, including means-tested income support to the poor, without of course missing the target of long-term debt sustainability.

Finally, Clifton, Díaz-Fuentes, and Revuelta (2020) especially from 2003, working best at the urban level. Public spending on education, personal income taxes and social contributions were especially instrumental in reducing income inequality.”author”:[{“dropping-particle”:,“family”:”Clifton”,”given”:”Judith”,”non-dropping-particle”:,“parse-names”:false,”suffix”:,“dropping-particle”:,“family”:”Díaz-Fuentes”,”given”:”Daniel”,”non-dropping-particle”:,“parse-names”:false,”suffix”:,“dropping-particle”:,“family”:”Revuelta”,”given”:”Julio”,”non-dropping-particle”:,“parse-names”:false,”suffix”:,“container-title”:”Journal of Latin American Studies”,”id”:”ITEM-1”,”issue”:”2”,”issued”:[{“date-parts”:[{“2020”}],“page”:”317-341”,”title”:”Falling inequality in Latin America: The role of fiscal policy”,”type”:”article-journal”,”volume”:”52”},“uris”:[“http://www.mendeley.com/



documents/?uuid=afd4ac6e-14b3-487e-9618-e302fdf5cee4”}],”mendeley”:{“formattedCitation”:(Clifton, Díaz-Fuentes and Revuelta, 2020 in their study of ‘Falling inequality in Latin America: the Role of Fiscal Policy’, for the time spanning of 1990 to 2014, examines the effects of nine fiscal instruments on income inequality in 17 countries. Fiscal policy had a positive – albeit small – effect in reducing income inequality, especially from 2003, working best at the urban level. Public spending on education, personal income taxes and social contributions were especially instrumental in reducing income inequality. Latin American governments could opt to increase further the number of fiscal instruments with redistributive effects or increase the intensity of these effects in those fiscal instruments that have worked, to further reduce inequality. One particularly important challenge would be to achieve a progressive redistributive effect in other components on the side of public spending, beyond the instrument of education. An additional challenge would be to run prudent but effective fiscal policies, by eliminating tax avoidance instruments and fighting tax evasion whilst, simultaneously, introducing policies to incorporate more citizens into the formal sector. This could be achieved by promoting inclusion and improving education for young people, whilst constructing better public infrastructure to connect marginalized urban areas.

Throughout all this literature, it can be seen that most studies depend on panel data analysis for different time horizon and the conclusion can be as follows:

Low tax revenue can lead to a high rate of poverty.

Poverty and inequality are influenced by the participatory, transparent, and accountable budgetary processes.

Fiscal policy by using tax collection will lead to reduce the rate of inequality but temporary.

Contractionary monetary and fiscal policies increase inequality.

Economic growth has a connection with the decrease in poverty.

As inequality increase the poverty rate also increases.

Inequality impacts the probability of banking crises through budget deficit, followed by government expenses.

Fiscal policy has an effect on poverty positively.

Fiscal policy has a positive effect in reducing income inequality.

In Iraq Tax instrument has not a noticeable effect on economic growth.

Studies have suggested some recommendations to governments and policymakers to reduce the rate of poverty and inequality. Recommendations can be summarized as:

Government has to enhance non-extractive revenues by revenue diversification.

Heavy investment in quality, accessible health and education services have to be proceed.

Budget allocation for infrastructure and health development will lead to promoting economic growth.

Policymakers have to be aware of the level of uncertainty when they implement a specific fiscal policy which may lead to an increase the poverty and inequality.

The limitation of these studies can be summed up in the quality of data, time intervals, and other shocks that happened in the studied time period which are difficult to avoid in these studies. Also, depending on different indexes to measure inequality and poverty rate for different studies have led to biases in the results. So, future studies are required for a different time spanning and different approaches in order to reveal the role of fiscal policy on inequality.

Thus, the contribution of this paper can be represented by its time interval, which is updated until 2019, and dummy variable



(ISIS) is included in the econometric model. Other studies depend on economic growth only, but in this paper, sub model has been included in order to see how economic growth can affect the rate of poverty. In other studies income per capita was the proxy of income inequality, the limitation of this proxy is that national income divided on population, it may tell that how much is economic growth but does not tell by how much poverty is decreased. We may have economic growth, but still poverty increase or does not change due to an unequal distribution of income. Also, different model (ARCH) used to estimate coefficients. Another limitation is no study has been found in English literature on Iraq regarding to this topic.

### 3. Methodology and Data Collection:

In this part, the framework of empirical procedure and data collection will be explained. This article relies on three major variables which are; Gross domestic production, poverty rate, government expenditure, and ISIS (Islamic State in Iraq and Syria) for the period of (2004-2019). There will be an econometrics analyses for these variables and their relation, effect and direction with each other.

The first variable Gross domestic production (GDP) in its real term has been chosen to indicate the economic growth in Iraq. This is because GDP includes all economic activities in the country in its total value. However, this indicator has a limitation that does not represent each sector in their real growth, but takes all of them together, which cannot tell so much about the growth in other sectors individually. Also, the non-market transactions have been excluded. Furthermore, it cannot represent the degree of income inequality (khanacademy.org, 2020). Data for the real GDP has been obtained from the World Bank data stream.

The second variable data, which is the poverty rate by using the headcount index method, has been gathered from a variety of resources, such as: (mop.gov.iq, 2020; microdata.worldbank.org, 2014; unicef.org, 2017; un.org, 2019; worldbank.org, 2013; alarabiya.net, 2020; raialyoum.com, 2015). This is due to the unavailability of the data in one official resource.

Regarding the third variable, which is about the government expenditure (GEXP) in its growth rate, has been obtained from the imf.org (2020) data stream. This indicator will provide information about how much of the government revenue has been used on goods and services in the country. Thus, it has been used as an indicator for the instrument of fiscal policy and how it will affect the economic growth and then will affect the inequality indirectly through economic growth, because as mentioned before, the greater the rate of economic growth the rate of inequality tends to decrease.

The final variable is ISIS, which represents a dummy variable in the model in order to reveal the effect of the unstable situation in Iraq because of war with the Islamic State during the year 2014 to 2018.

The empirical analysis will be conducted through main and sub-models. The main model consists of economic growth as the dependent variable and government expenditure with ISIS as independent variables with the aim of determining the effect of these two variables on economic growth. Regarding the sub-model will be the rate of poverty as the dependent variable and economic growth as the independent variable. Econometrically, these two models can be expressed as follow:

..... Main Model

..... Sub Model

$$t = 1,2,3,...T$$

GDP = Gross domestic production (indicator for economic growth).

G.EXP = General government expenditure (instrument of fiscal policy).

ISIS = Dummy variable (represents conflicted time in Iraq).

POV= the rate of Poverty.

$\beta$  = coefficient of variables (indicates the degree of effect of independent variables on the dependent variable).



$\epsilon$  = Error term for the regression model.

T = time interval

To estimate the coefficient of these models the Auto Regressive Conditional Heteroscedasticity (ARCH) Model has been used to estimate the main model, and Auto Regressive Distributed Lag (ARDL) Model for the sub model estimation. This is by using the statistical computer package Eview (V.9).

As well as the tests of stationarity (this is crucial for time series data which it is the case in this article), cointegration (to illustrate the long relationship between variables), and correlation (reveals the relationship between variables) will be preceded for variables before engaging into the regression model. After the regressions, there will be tests for econometrics problems in the model such as; Serial correlation, Hetero, Multicollinearity, Identification problem.

Furthermore, in the end there will be an attempt to proceed the forecasting for economic growth and government expenditure in Iraq in order to indicate their rate in the near future.

4. Results:

Before going to an estimation of the coefficients through the regression model, critical tests regarding time-series data have to be done. The first one is a stationary test. As it has been illustrated in table (1), it can be seen that all variables, after transforming them to log type, are stationary at their first difference:

Table (1) Result of PP test for all variables

PP test at first difference		
Variables	Adj.t-test	.Prob
G.EXP	-2.823926	***0.0084
Poverty	-4.716703	***0.0029
GDP	-23.13091	***0.0001
significant at 10%, **significant at 05%, ***significant at 01%*		

The first difference method is applied to transforming observed data for all variables in order to be stationary. After transformation, Philip Peron (PP) test indicates that all variables are stationary. G.EXR, Poverty, and GDP are stationary at the 1% level of significance. The next procedure is to determine the correlation between variables as has been shown in the table (2):

Table (2) Correlation test for all variables

Variable	G.EXR	Poverty	GDP	ISIS
G.EXP	1.000000	-0.270308	0.522717	-0.584242
Poverty	-0.270308	1.000000	-0.063618	0.541605
GDP	0.522717	-0.063618	1.000000	-0.189836
ISIS	-0.584242	0.541605	-0.189836	1.000000

As it can be observed from the result, there is a negative relationship between government expenditure with poverty and ISIS. This means as G.EXP increases poverty tends to decrease, and as there is war (ISIS), there will be a decrease in G.EXP because most government service units will be closed due to safety. Thus as a result, G.EXP will decrease.

Furthermore, it can be seen that G.EXP has a positive relationship with GDP and it is relatively high with a value of (0.541605).



It can be interpreted as G.EXP increase GDP also tends to increase. Regarding Poverty there is a negative but very weak relationship between this variable and GDP with the value of (-0.063618), indicates as GDP increases Poverty tends to decrease but in a very small ratio, which can be said there is a high rate of inequality in term of income distribution in the economy although GDP increases. Also, there is a relatively high positive relationship between Poverty and ISIS because there is a war (ISIS) there will be migration and destruction in the country which will lead to an increase in the rate of poverty.

The next test is Co-integration test by using the Johanson test method. This is more preferred in multiple regressions than Engel Granger Cointegration test (Faik B.1998). The result is illustrated in the table (3):

Table (3) Result of Johanson Test for Co-integration

Sample (adjusted): 2006 2019				
Included observations: 14 after adjustments				
Trend assumption: Quadratic deterministic trend				
Series: GDP G.EXP POVERTY				
Lags interval (in first differences): 1 to 1				
(Unrestricted Cointegration Rank Test (Trace				
Hypothesized		Trace	0.05	
No. of (CE(s	Eigenvalue	Statistic	Critical Value	** .Prob
* None	0.975503	63.17667	35.01090	0.0000
At most * 1	0.503207	11.24778	18.39771	0.3682
At most * 2	0.098623	1.453649	3.841466	0.2279
Trace test indicates 1 cointegrating eqn(s) at the 0.05 level				
denotes rejection of the hypothesis at the 0.05 level *				
MacKinnon-Haug-Michelis (1999) p-values**				
(Unrestricted Cointegration Rank Test (Maximum Eigenvalue				
Hypothesized		Max-Eigen	0.05	
No. of (CE(s	Eigenvalue	Statistic	Critical Value	** .Prob
* None	0.975503	51.92888	24.25202	0.0000
At most * 1	0.503207	9.794136	17.14769	0.4166
At most 2	0.098623	1.453649	3.841466	0.2279
Max-eigenvalue test indicates 1 cointegrating eqn(s) at the 0.05 level				
denotes rejection of the hypothesis at the 0.05 level *				





MacKinnon-Haug-Michelis (1999) p-values\*\*

The result shows that there is one Cointegration at the level of 5% of significant (p-value = 0.0000<trace>), and one of variables is Cointegrated at the level of 5% of significant (p-value = 0.0000<maximum Eigrnvalue>). This means one variable in the long run is related to other. This is the condition of preceding the time series regression model. The next test is to see the directional effect of variables through the causality test.

Now, after all those tests for variables, the regression model ARCH has been applied for the main model. It has been shown in table (4); also the ARDL model has been applied for the sub model as has been shown in the table (5).

Table (4) ARCH Model Estimation

Dependent Variable: GDP				
Method: ML ARCH-Normal distribution (BFGS/Mar-quardt steps)				
Sample: 2004 2019				
Variable	Coefficient	Std. Error	z-Statistic	.Prob
(SQRT (GARCH@	3.093490	1.061847	2.913310	0.0036
G.EXP	0.774643	0.153030	5.062048	0.0000
ISIS	3.536174	9.735343	0.363231	0.7164
C	-44.27414	6.210494	-7.128923	0.0000
R-squared	0.817824	Mean dependent var		8.125438
Adjusted R-squared	0.772280	S.D. dependent var		12.97468
S.E. of regression	6.191523	Akaike info criterion		6.946665
Sum squared resid	460.0194	Schwarz criterion		7.429533
Log likelihood	-45.57332	Hannan-Quinn criter		6.971392
Durbin-Watson stat	1.673059			

Now, as it can be seen from table (4) that the coefficient of G.EXP is equal to (0.77) with a positive sign and prob. of (0.0000), this indicates the coefficient is significant at the level of 1%, also the positive sign indicates the positive relationship between GDP and G.EXP, thus as G.EXP increases by 1% the GDP will increase by 0.77% percent.

For the ISIS variable, the result shows that its coefficient approximately is equal to (3.53) with a positive sign and prob. of (0.7164) which this indicates it is not significance at the level of 5%. Furthermore, the prob. of constant is (0.0000) for its coefficient which indicates its significance at the level of 1%. The value of R2 and Adj. R2 for the regression model is (0.81) and (0.77) respectively, means the model is well fitted and variable G.EXP can explain GDP by 0.81 percent. This is because the government expenditure is one of the four components of GDP that is participates in GDP by a high ratio. The model has relatively small S.E (6.191523) and relatively small AIC (6.946665) which indicates missing information of the model.



Table (5) ARDL Model Estimation

Dependent Variable: POVERTY				
Method: ARDL				
Sample (adjusted): 2007 2019				
Fixed regressors: C @TREND				
(Selected Model: ARDL(4, 4				
Variable	Coefficient	Std. Error	t-Statistic	*.Prob
GDP	-0.835160	0.0422340	-19.72494	0.0322
(GDP(-1	-1.081225	0.073379	-14.73474	0.0431
(GDP(-2	-1.710846	0.078005	-21.93259	0.0290
(GDP(-3	-1.569326	0.110209	-14.23950	0.0446
C	46.24200	13.14833	3.516948	0.0126
TREND@	2.048066	0.113881	17.98432	0.0354
R-squared	0.999497	Mean dependent var		24.04167
Adjusted R-squared	0.994470	S.D. dependent var		4.789090
S.E. of regression	0.356123	Akaike info criterion		0.121345
Sum squared resid	0.126824	Schwarz criterion		0.565843
Log likelihood	10.27193	.Hannan-Quinn criter		-0.043224
F-statistic	198.8292	Durbin-Watson stat		2.448861
(Prob(F-statistic	0.055139			

The second regression model (ARDL) in table (5), indicates that GDP has a prob. of (0.0322) means its coefficient, for its negative value of (-0.83), is significant at the level of 5%. Thus the increment of GDP by 1% will lead to decrement in the rate of poverty by (0.83%). The coefficients for other lagged GDP, constant, and trend are significant at the rate of 5% because their prob. are smaller than 5%. The other statistical indicators such as (R<sup>2</sup>=0.99), (S.E. = 0.35), and (prob. of F-test = 0.055<10%) indicate that the model is well described.

After the regression model, the tests of reliability of the models have been done. The results have shown in the table (6):

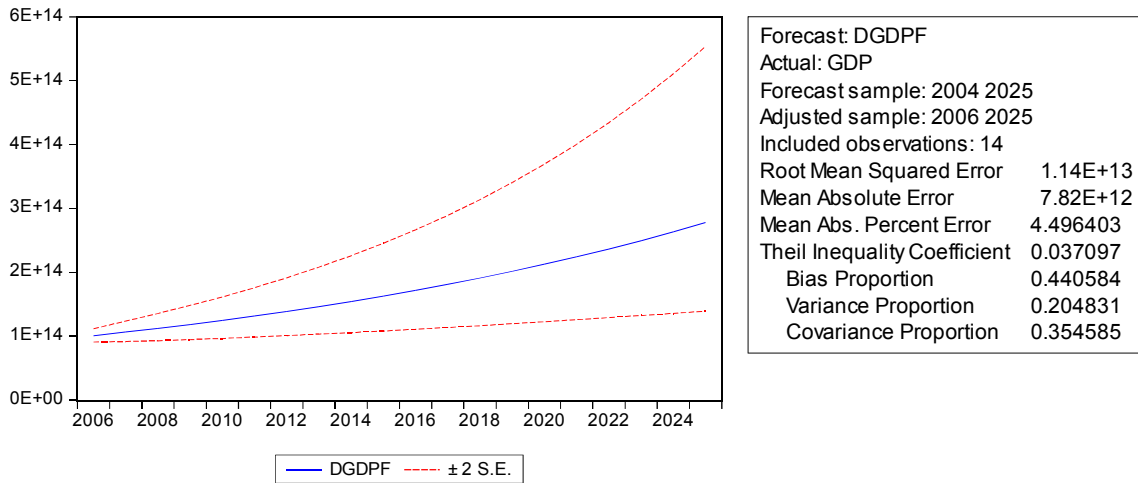
Table (6) Tests of Reliability of the Models

Models	LM	.Hetero	VIF	Identification
	R-Square	R-Square	Centered	F-statistic
ARCH	-	[0.1986]1.65	-	-
ARDL	[0.2627] 2.67	[0.5677] 4.81	Less than 10	[0.1020] 9.05

From the table, it can be conclude that the regression models are out of econometric problem due to their p-value is greater than (0.05).

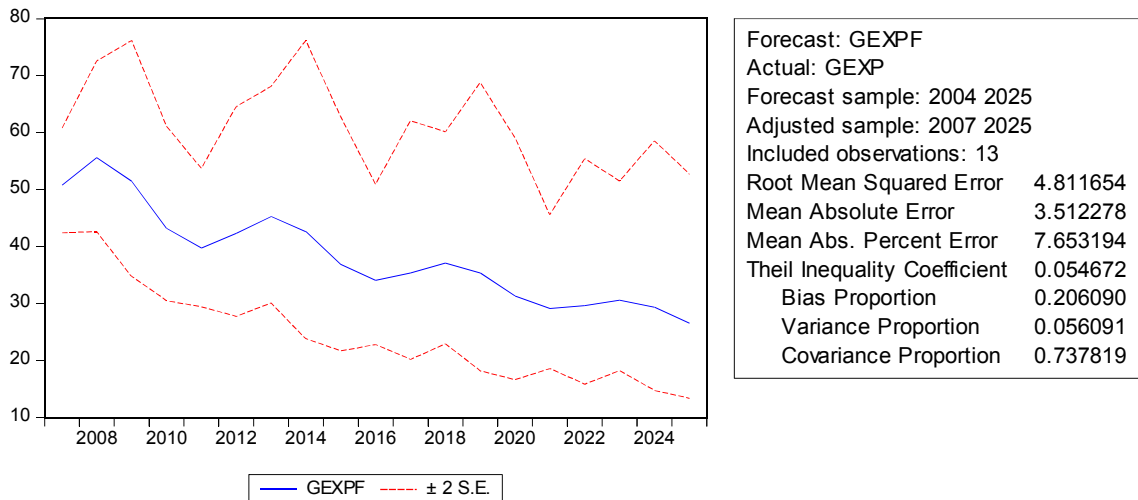


Graph (1) GDP Forecasting from 2020 to 2025



From graph (1) it can be seen that the DGDPF increases at a steady rate. The model has a relatively low Theil Inequality coefficient with a rate of (0.037097) and with a relatively high bias proportion rate of (0.440584).

Graph (2) G.EXP Forecasting from 2020 to 2025



From graph (2) it can be seen that the G.EXP decreases at a relatively sharp rate. The model has a relatively low Theil Inequality coefficient with a rate of (0.054672) and with a relatively high bias proportion rate of (0.206090).

#### 5. Discussion:

Based on statistical results for the main model table (4), it shows that the economic growth, which is represented by GDP, is positively affected by government expenditure. This is convey with macroeconomic theory; which states that GDP increases as its components increase (aggregate consumption, investment, government expenditure, and trade balance) (Rode S. 2012, pp.138-140). Also, for 1% increase in the government expenditure will lead to an increase in GDP or economic growth by 0.77%.

For the ISIS variable, although, statistical test shows that ISIS is not significant and has no effect on the GDP in the model. But still it works as a helping variable. The result shows that the ISIS positively affects GDP. With a presence of the War in Iraq GDP tends to increase by 3.5%. Although this is not convey with economic theory, because as there is a War there should be a decrease in the GDP thus all economic sectors are negatively affected by War, but this positive result can be explained by; 1; as there is a War the government expenditure on military actions will increase. 2; the aggregate consumption in Iraq still is on basic



goods and services, which means that the consumer behaviour will not change toward the consumption, they try to fulfil their basic needs. Thus there will not be a decrease in aggregate consumption.

Regarding investment, there was a low level of investment in Iraq before its engagement in War, thus investment is not affected at a high level by War. Finally, the Iraq trade balance is not affected by War, because it heavily depends on exporting oil, and this sector is not affected by War or ISIS. As a result, government expenditure and ISIS positively affect economic growth in Iraq is GDP is an indicator and a representative of economic growth.

One interesting thing is about the constant term in the model which is negative, as mentioned in the macroeconomics for growth model by Solow model, every economy has a rate of depreciation (Mankiw, 2013). This constant in this model economically means when there is no more growth in the economy the government expenditure should be at the rate of 44% of its total GDP ratio in order to stay at the same level of GDP. Or it can be said that the economy needs that amount of government expenditure and to compensate its depreciation to stay at the same level of growth.

For the second model-Sub model, the result from the table (5) shows that there is a negative relationship between poverty and economic growth. As economic growth increases by 1%, the rate of poverty decreases by 0.83% for the same year. Also, as it has been shown by the lagged GDP, the previous growth has affected the rate of poverty by a greater percentage compared to the growth in the same year. For example; the economic growth for the two previous years (GDP-2) has affected the rate of poverty by 1.71% in this year. This means that, the effect of economic growth on poverty in this year will have a greater impact on the poverty rate in the next year. This can be explained by the effect of the government multiplier which states that the government expenditure will have a multiplier effects on economy throughout consumption and then investment. As economic growth is achieved in this year this will affect the future poverty rate in decreasing trend as well.

The constant term in this model states that, if the government does not intervene in the economy by its fiscal policy, in this situation by expansionary action, the rate of poverty will be 46% as aggregate. Also, the trend in the model states that the rate of poverty tends to increase by the rate of 2% each year in Iraq. This is quite true. Because the raw data of poverty which has been used in this article and attached an appendix with this article shows that the rate of poverty is in increasing trend since 2012 and the government expenditure ratio to GDP is in decreasing trend since then as well.

Furthermore, from the forecasting test, it is predicted that the GDP of Iraq may increase until 2025 relatively in a steady rate. This may be due to the change in oil price by increasing its price leads to an increase in GDP. However, the government expenditure is anticipated to decrease quite sharply. Also, it is anticipated that the poverty rate increase for those subsequent years due to drawing back the expansionary action by the government and because most of Iraqi people works and are employed in the public sector. Also, it is known that Iraq recently going through a difficult situation related to its general budget that has a high deficit and wants to decrease its expenditure in order to balance its budget. Another action which has been done was by devaluating its currency, which will affect the standard of living because most of the goods and services in Iraq are imported. That action will lead to an increase in their price and lower the standard of living; poverty tends to increase as a consequence.

All in all, government expenditure will increase economic growth. As a consequence the rate of poverty will decrease. However, economic growth does not eliminate poverty in the country because the inequality in income distribution is still present. Although there was a War in Iraq the rate of growth is still an increasing rate.

## 6. Conclusion:

The aim of this article was to examine the role of fiscal expenditure on Inequality throughout economic growth. Two models have been applied to reveal this effect and relation. Iraq for the time interval of 2004 to 2019 has been chosen. Variables were GDP, G.EXP, and ISIS. The main model has been estimated by ARCH model, which reveals that G.EXP had a positive impact on economic growth by the rate of 0.77% and was significant at the level of significant 5%.



The second model, Sub-model, has been applied by using ARDL model for the variables of poverty and GDP. The result shows that the GDP in the current and three previous years have impacted poverty negatively. As GDP increased the rate of poverty has declined. Their coefficients were significant at the level of significant 5%.

From the forecasting results for subsequent years (2020-2025), shows that the economic growth is anticipated to increase and government expenditure is decreasing. Also, from the trend of sub model, it is expected to increase the rate of poverty by 2.04% yearly.

As a recommendation for Iraqi policy makers, Iraq has to take more effective actions toward the poverty rate, because it is in growth rate since 2012. Although its GDP has been in growing poverty has increased which tells that there is an inequality in income distribution. Also, the impact of war on poverty was high and led to destruction and migration by a vast population inside Iraq. Government should reconstruct the affected areas by war in order to decrease the migrations. Furthermore, enhance the domestic investment to provide more job vacancies to stimulate the economy and to improve the government multiplier in an effective manner.

This article has come through some limitations, such as; there was difficulty to obtain the poverty rate from official organizations. Some other variables are excluded from the model which can have an effect on economic growth and poverty. Taxation policy has not been considered in this article which may have an effect on GDP and poverty as well. This article does not study the effect of ISIS on the poverty rate. The time interval in this article is relatively small which may lead to biasness of the results. Due to these limitations further research are recommended especially for longer time interval and another fiscal policy instrument.

الملخص:

بشكل عام يميل النمو الاقتصادي إلى تقليل عدم المساواة في الاقتصاد. الهدف من هذه المقالة هو تحديد دور السياسة المالية في عدم المساواة خلال النمو الاقتصادي. تم اختيار العراق للفترة (2004-2019) لدراسة متغيرات الإنتاج المحلي الإجمالي (GDP) والإنفاق الحكومي (G.EXP) والفقر و ISIS كنموذج. تم تطبيق نموذجين، الأول: هو نموذج لتأثير G.EXP و ISIS على الناتج المحلي الإجمالي باستخدام نموذج ARCH. تظهر النتيجة أن G.EXP و ISIS كان لهما تأثير إيجابي على النمو الاقتصادي. النموذج الثاني هو فحص تأثير الناتج المحلي الإجمالي على الفقر باستخدام نموذج ARDL. تظهر النتيجة أن الناتج المحلي الإجمالي له علاقة سلبية مع الفقر، حيث أن الناتج المحلي الإجمالي يزيد ومعدل الفقر يميل إلى الانخفاض. آثار النمو الاقتصادي السابق لها تأثير أكبر على معدلات الفقر. ومن المتوقع أن ينخفض G.EXP ويزيد الناتج المحلي الإجمالي للفترة من 2020 إلى 2025. يوصى بأن تتخذ الحكومة إجراءات فورية لخفض معدل الفقر وتقليل عدم المساواة في توزيع الدخل في الاقتصاد وإعادة بناء المنطقة المتضررة من الحرب لإعادة الأشخاص المهاجرين إلى مكانهم الأصلي. ويزيد من الإنفاق الاستثماري. هناك حاجة إلى مزيد من الدراسة بفواصل زمني مختلف وأطول والمتغيرات النسبية الأخرى المتعلقة بهذا الموضوع وباستخدام طرق مختلفة للنماذج القياسية.

پوخته:

به شیوهی که گشتی که شهی نابووری یارمه تیده ری که مکردنه وهی نا یه کسانیه له نابووریدا. نامانج لهم توژیژینه وهیه بریتیه له دیار یکردنی رۆلی رامیاری دارایی له سهه نا یه کسانی نابووری له ریگه ی که شهی نابووریه وه. سالانی 2004-2019 هه لژیژردراوه بۆ لیکۆئینه وه له سهه گۆراوه کانی به رهه می ناوخوی گشتی (GDP) وه خه رجی ده ولته (G.EXP) وه هه ژاری و داعش (ISIS) وه ک نمونه. دوو مۆدیل لیره دا لیکۆئینه وه له سهه کراوه ئاوانیش، یه کهم؛ کاریگه ری خه رجی ده ولته و داعش له سهه به رهه می ناوخوی گشتی به به کاره یئانی مۆدیلی ARCH. که ئانجامه که ی نه وه مان پیده ئیت که خه رجی ده ولته کاریگه ری نه ریئنی هه بووه له سهه به رهه می ناوخوی گشتی. وه مۆدیلی دووهم؛ بریتیه له زانیی کاریگه ری به رهه می ناوخوی گشتی له سهه هه ژاری به به کاره یئانی مۆدیلی ARDL. نه نجامه کان نه وه مان بۆ ده رده خات به رهه می ناوخوی گشتی پیوه ندیه کی پیچه وانیه هی هیه له گه ل هه ژاری، به شیوه یه که به رهه می ناوخوی گشتی زیاد ده کات وه هه ژاری کهم ده کات. وه کاریگه ری نابووریه کنی سالانی پیشتی ئهم کاریگه ری یان گه ورته ره له سهه تیکرای هه ژاری. وه وا پیشینی ده کریت که خه رجی ده ولته کهم بکات و به رهه می ناوخوی گشتی زیاد بکات له ماوه ی سالانی 2020 بۆ 2025. پیشینار ده کریت که ده ولته به شیوه یه کی به په له هه ستیت به ریکاری پیویست بۆ نمکردنه وه تیکرای هه ژاری و نا یه کسانی نابووری له دابه شکردنی داهاتی نابووری و بونیاتنه وه ی نه شو ئانه ی که زه ره رمه ندبوون به هوی شه ره وه به مه به سته گه راندنه وه ی ئاوه ره کان بۆ شو ئنی راستی خو یان، وه هه ره ها زیاد کردنی خه رجی وه به ره یئان. ئهم بابه ته پیویستی به توژیژینه وه ی زیاتر هیه به بۆ سالانی جیاواز و زیاتر و به کاره یئانی گۆراوی تری ریژه یی په یوه ندیدار بهم بابه ته وه، وه ریگه ی شیکاری نابووری پیوانه یی جیاوازر.



References:

Al-Arabiya.net, 2020. Available at:

<https://www.alarabiya.net/ar/politics/2020/03/04/%D8%A7%D8%B1%D8%AA%D9%81%D8%A7%D8%B9-%D9%86%D8%B3%D8%A8%D8%A9-%D8%A7%D9%84%D9%81%D9%82%D8%B1-%D9%81%D9%8A-%D8%A7%D9%84%D8%B9%D8%B1%D8%A7%D9%82-%D9%85%D9%86%D8%B0-2003-%D8%A8%D8%B3%D8%A8%D8%A8-%D8%A7%D9%84%D9%87%D8%AF%D8%B1-%D9%88%D8%A7%D9%84%D9%81%D8%B3%D8%A7%D8%AF>. (Accessed: 20 February 2021).

Apergis, N. (2020) 'The role of fiscal policy in the link between income inequality and banking crises', *Applied Economics Letters*, 00(00), pp. 1–5. doi: 10.1080/13504851.2020.1808570.

Araújo, C. H. V. (2007) 'Pedro Cavalcanti Ferreira and Carlos Hamilton Vasconcelos Araújo', *Fiscal Policy, Stabilization, and Growth*, p. 297.

Aye, G. C., Clance, M. W. and Gupta, R. (2019) 'The effectiveness of monetary and fiscal policy shocks on U.S. inequality: the role of uncertainty', *Quality and Quantity*, 53(1), pp. 283–295. doi: 10.1007/s11135-018-0752-3.

Bailey, S. J. (1995) *Public Sector Economics: Theory, Policy and Practice*. Macmillan (Macmillan texts in economics). Available at: <https://books.google.iq/books?id=TXR2QgAACAAJ>.

Bander, Raja; Kadhm, E. (2018) 'the effect of monitary and fiscal policy on economic growth in Iraq for the period of 1980-2016', *Journal of monetary and Financial Studies*, pp. 38–71.

Clifton, J., Díaz-Fuentes, D. and Revuelta, J. (2020) 'Falling inequality in Latin America: The role of fiscal policy', *Journal of Latin American Studies*, 52(2), pp. 317–341. doi: 10.1017/S0022216X20000334.

Ebady, Batol; Kadem, S. (2012) 'The role of fiscal policy in the current environment', *Journal of Qadssia for Economic and administration science*, 15(2). Available at: <https://treasury.gov.au/speech/the-role-of-fiscal-policy-in-the-current-environment>.

Gallardo Pérez, H. J., Vergel Ortega, M. and Cordero Díaz, M. C. (2019) 'Economic growth model in developing economies', *Journal of Physics: Conference Series*, 1388(1). doi: 10.1088/1742-6596/1388/1/012033.

Keita, L. (2018) 'Models of economic growth and development in the context of human capital investment: The way forward for Africa', *Africa Development*, 43(3), pp. 159–184.

Khusaini, M., Wahyudi, S. T. R. I. and Utama, Z. S. (2018) 'DOES TRADE OPENNESS AND FISCAL POLICY AFFECT INEQUALITY AND ECONOMIC GROWTH? A STUDY IN INDONESIA', *Regional Science Inquiry*, X(2), pp. 215–226. Available at: <https://econpapers.repec.org/RePEc:hrs:journl:v:x:y:2018:i:2:p:215-226>.

Mankiw, N. G. (2013) *Macroeconomics*. Eighth. Harvard University: Worth Publisher.

Mankiw, N. G. (2018) *Principles of Economics*, 8th ed. Eight. United State of America.

Michálek, A. and Výboštok, J. (2019) 'Economic Growth, Inequality and Poverty in the EU', *Social Indicators Research*, 141(2), pp. 611–630. doi: 10.1007/s11205-018-1858-7.

NADAR, E. N. (2013) *MONEY AND BANKING*. PHI Learning. Available at: <https://books.google.iq/books?id=EtKPMY6oYwEC>.

Odusola, A. (2017) 'Fiscal Space, Poverty and Inequality in Africa', *African Development Review*, 29, pp. 1–14. doi: 10.1111/1467-



8268.12229.

Organization for Statistics and Information Technology (2012) Iraq Household Socio-Economic Survey 2012, Kurdistan Regional Statistics Office (KRSO). Available at: <https://microdata.worldbank.org/index.php/catalog/2334/study-description> (Accessed: 5 March 2022).

Samuelson, Paul Anthony; Nordhaus, W. D. (2010) Economics. ninth. McGraw-Hill/Irwin.

World Economic Outlook Database (2020) International Monetary Fund. Available at: [https://www.imf.org/en/Publications/WEO/weo-database/2020/October/weo-report?c=433,&s=NGDP\\_RPCH,&sy=2003&ey=2020&ssm=0&scsm=1&sc=0&ssd=1&ssc=0&sic=0&sort=country&ds=.&br=1](https://www.imf.org/en/Publications/WEO/weo-database/2020/October/weo-report?c=433,&s=NGDP_RPCH,&sy=2003&ey=2020&ssm=0&scsm=1&sc=0&ssd=1&ssc=0&sic=0&sort=country&ds=.&br=1) (Accessed: 5 March 2022).

Appendix: List of Variables and their observations:

Year	Poverty	GDP	G.EXP	ISIS
2004	23.9	53.386	63.205	0
2005	23.6	1.675	50.329	0
2006	23.3	5.638	46.122	0
2007	22.9	1.889	57.254	0
2008	23	8.228	58.932	0
2009	23	3.379	49.575	0
2010	23	6.403	43.369	0
2011	18.9	7.546	42.892	0
2012	18.9	13.936	48.249	0
2013	19	7.628	43.783	0
2014	22.5	0.738	43.442	1
2015	26.5	2.537	40.743	1
2016	30	15.199	34.658	1
2017	31.5	-2.495	31.75	1
2018	20.5	-0.106	35.635	0
2019	31.7	4.426	48.269	0