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Measuring the Impact of Public Expenditure on the Balance of Payments Using the ARDL Model in Iraq for the Period (2004–2023)

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Abstract. *Government expenditure is a great reason in economic stability and its impact on the balance of payments is dire. In this light, this paper seeks to use the time series analysis method and the ARDL model to investigate the association between the balance of payments of Iraq and the public spending within the 2004-2023 period. The Eviews 13 software was used to analyse it. The findings show that there is a positive association between spending by the people and balance of payment especially at the short run. The latter findings indicate that the efficiency of government expenditure reform is a necessary tool to accomplish the expansion and close the balance of payments deficit. This study highlights the importance of strategic fiscal policies and government spending in achieving a balanced economy and sustainable growth. Additionally, it emphasizes the need for continuous monitoring and adjustment of public spending to ensure its alignment with national economic objectives. The findings contribute to the understanding of fiscal policy implications in developing economies, especially in the context of Iraq's economic challenges.*

Keywords: *ARDL model, Balance of payments, Eviews 13 software, Public expenditure, strategic fiscal*

1. INTRODUCTION

The relationship between the balance of payment and state expenditure is soundly placed in determining the financial stability of any country and the development of the economy. As the economical and political changes have highly occurred in Iraq since the year 2003, the actualization of this relationship has been instrumental in the introduction of sound economic policies. The problem of Iraq is growing budgetary gaps and trade limitations and this study is particularly timely. It is with this work that we hope to provide the policymakers with information that is going to improve the performance of the economy and financial sustainability. In this paper, the impact of the state expenditure on the balance of payment will be reviewed and a recommendation will be given as to how the Iraqi economy can further be improved.

Research Problem

The primary challenge of the current study is understanding the complex relationship that exists between the public expenditure and balance of payment of Iraq. Since Iraq is a rentier economy and the government tries to enhance growth by spending more money, it is likely to worsen the balance of payments deficit.

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Research Significance

This paper will formulate a comprehension of this rather significant relationship by explicating the position of the public expenditure and its effects on the balance of payments within Iraq.

Research Objective

The purpose of the study is to analyze and describe the connection between the balance of payment and the government spending in Iraq during 2004-2023.

Research Hypothesis

The research shows that the relationship between the balance of payments in the short and long run and the level of public spending are positively correlated.

Research Methodology

The study conducts the analyses of the two variables based on the statistical and econometric methods and time series analysis based on ARDL model.

Research Structure

The research is organized into two main sections:

1. **Conceptual Framework:** a summary of the balance of payments, governmental spending, and their connection.
2. **Empirical Analysis:** Iraq's balance of payments and public spending connection is measured using the ARDL model for the years 2004–2023.

2. PREVIOUS STUDIES

The linkage between the government expenditure and the key macroeconomic variables like the balance of payment is a topic that has been given much literature. To investigate these short- and long-run dynamic relations, a number of studies have been dedicated to the use of such models as ARDL (Autoregressive Distributed Lag).

In one Nigerian study it was determined that current expenditure yields little or no effect on economic growth and that capital expenditure yields a long-term and short-term effect that is positive. This underlines the importance of the quality of the government spending in generating positive economic outcomes (Onifade, S.T., Çevik, S., Erdoğan, S. et al.). A statistical analysis of the correlation between the growth of the economy and government expenditure.

Furthermore, a study that looked at the relationship between public spending and balance of payments performance in developing economies found that while public capital expenditures can help improve the balance of payments in the short term, they can also result in a deficit

over time if they are not managed effectively (Chandana Aluthge, Adamu Jibir, Impact of Government Expenditure on Economic Growth in Nigeria).

ARDL model has been found useful in the study of long-term dynamics between the government expenditure and the economy. In a Nigerian context, this model was used to assess the impact of fiscal policies and demonstrated its ability to account for the time-varying effects of economic variables (Stephen Taiwo Onifade, Savaş Çevik, An empirical retrospect of the impacts of government expenditures on economic growth.

One of the significant research is that of Muhammad Lahsan Allawi. Additionally, a standard study conducted from 1990 to 2018 under the title "Analysis of the relationship between the result of the general budget and the position of the balance of payments, the case of Algeria" came to the conclusion that the relationship between the two deficits to and from the general budget and the balance is strengthened because oil revenues have an impact on both the general budget deficit and the trade balance, and because oil revenues are important for both the general budget's components and the trade balance's items. commercial.

Despite the substantial body of literature on the subject, studies specifically addressing the direct relationship between public expenditure and the balance of payments in Iraq remain scarce, which underscores the significance of this research in filling this gap and offering valuable insights using the ARDL model.

3. CONCEPTUAL FRAMEWORK OF PUBLIC EXPENDITURE AND THE BALANCE OF PAYMENTS

Concept of Public Expenditure

The term "public expenditure" describes the monetary contributions made by the government, as authorized by the legislature, to fulfill economic and social goals and provide public goods and services. (Mithani, 2020: 221). It also involves expenditures made by the government to fulfill public needs (Atlam, 2004: 76). The primary purpose of public expenditure is to maximize public welfare (Al-Wadi, 2001: 126). Public expenditure is categorized into:

1. **Current Expenditure:** Used to cover operational expenses and recurring needs, with effects limited to the fiscal year in which they occur.
2. **Capital Expenditure:** Allocated for capital assets and infrastructure development, aimed at increasing production and public services (Barakat, 1986: 78).

Concept of the Balance of Payments

The balance of payments is a statistical overview of a country's economic interactions with the rest of the world during a specific time period. (McLenaghan, 1996: 1). It serves as a historical record of economic transactions and reflects the country's external obligations and entitlements (Hudson, 1987: 185). The balance of payments comprises three main components:

1. **Transactions with non-residents:** Includes trade, services, capital flows, and unilateral transfers.
2. **Transactions by domestic residents:** Involves individuals, companies, and government agencies.
3. **Period coverage:** Typically covers transactions over one year.

In essence, the balance of payments acts as a mirror reflecting a country's economic status and trade position with the rest of the world.

Relationship between Public Expenditure and the Balance of Payments

Public expenditure influences the balance of payments indirectly by affecting aggregate demand. As government spending increases, the demand for goods and services rises, which may lead to higher imports if domestic production is insufficient (Shawabkeh, 2001: 40).

In certain cases, governments offer subsidies to encourage the production of export-oriented goods, which can improve the trade balance (Al-Janabi, 1991: 47). However, excessive government spending can also lead to inflationary pressures, especially when the productive capacity of the economy is limited (Dodge, 2005: 667).

Empirical Analysis of Public Expenditure and the Balance of Payments in Iraq (2004–2023)

Table 1. Public Expenditure and Balance of Payments in Iraq (2004–2023) (in Million USD).

Year	Public Expenditure	Growth (%)	Balance of Payments	Growth (%)
2004	22089.05846	-17.9	4212	-2.1
2005	18139.73521	-17.9	4122	21.0
2006	26689.60041	47.1	7360.8	78.6
2007	30830.35703	15.5	11787.3	39.7
2008	49379.36409	60.2	1800.8	53.1
2009	44472.94839	9.9	5000.8	727.8
2010	4308.47173	22.1	6286.3	225.7
2011	38227.02592	72.0	10393.7	65.3

2012	73296.6099	25.9	7986.8	323.2
2013	86677.23195	18.3	7860.9	1.6
2014	67766.60665	-21.8	8571.2	-25.1
2015	57094.49716	-15.7	13473.6	13.5
2016	4393.70397	-8.7	8344.1	38.1
2017	61224.74858	12.6	2701.2	-67.6
2018	66837.34628	9.2	6595.8	344.2
2019	91202.87592	36.5	10791.9	3.6
2020	60865.9544	-33.3	8272.2	-176.7
2021	69728.58237	14.6	10791.9	-230.5
2022	69981.86508	0.8	1684.2	8.3
2023	85348.8	22.0	20078.8	7.8

Compound Growth:

Public Expenditure: 6.9%

Balance of Payments: 8.18%

Source: Statistical Bulletins of the Central Bank of Iraq, Various Years

Simple growth rate calculated according to the following formula:

The composite growth rate is calculated according to the following formula:

R = [(PT/PO)^(1/N) - 1] * 100

From Table (1), we notice that public spending in Iraq in 2004 was (22,089.05846) million dollars, while the balance of payments was positive, amounting to (4,212) million dollars. This year marked the first year after the political system change in Iraq, which saw economic and social changes as well as an open consumption pattern after the country had been under siege. Public spending in this year had an expansive effect since the Iraqi economy had just come out of a regime-change war, leaving it exhausted and devastated. Efforts were being made to restore the economy and restart economic activity through public spending and stimulating effective aggregate demand in the economy.

Public spending continued to increase until 2009 when the world experienced a global crisis in the U.S. mortgage market that extended to other countries. The global economy faced a crisis that led to a decline in oil prices. Since Iraq is a rentier state that relies on oil exports to finance public spending, we observe a decrease in spending in 2009 to (44,472.94839) million dollars, with a negative growth rate of (9.9%). This was reflected in the balance of payments,

which recorded a negative net external transactions balance of (5,000.8) million dollars, with a negative growth rate of (127.8%).

In the years (2010-2014), public spending witnessed a continuous rise due to Iraq's need for current and investment spending for the reconstruction of the country until 2015, when public spending decreased due to significant parts of Iraq falling into the hands of terrorism on one side and a decline in global oil prices on the other. This led to a reduction in public spending to (57,094.49716) million dollars, with a growth rate of (15.7%). The balance of payments amounted to (13,473.6) million dollars, with a growth rate of (13.5%) due to the war on terrorism and the ISIS war.

In the years (2016-2019), public spending in Iraq increased until 2020 when public spending declined again, reaching (60,865.9544) million dollars, with a negative growth rate of (33.3%). The balance of payments also recorded a negative balance of (8,272.2) million dollars, with a negative growth rate of (176.7%) due to declining oil prices and the COVID-19 pandemic that affected the world.

In the years (2021-2023), public spending continued to rise, reaching (85,348.8) million dollars in 2023, with a positive growth rate of (22.0%). The balance of payments amounted to (20,078.8) million dollars, with a positive growth rate of (71.8%). Regarding the compound growth for the entire period, public spending showed a growth rate of (6.9%) and a compound growth rate for the balance of payments of (8.18%).

4. ANALYZING THE RELATIONSHIP BETWEEN PUBLIC SPENDING AND THE BALANCE OF PAYMENTS USING THE DISTRIBUTED LAG AUTOREGRESSIVE MODEL IN IRAQ FOR THE PERIOD (2004–2023)

Research Variables and Descriptive Statistics

To test the study hypothesis and achieve its objectives, the following specifications have been made for the independent variable, public spending, and the dependent variable, the balance of payments:

1. **G**: Public Spending (Independent Variable)
2. **BP**: Balance of Payments (Dependent Variable)

The following functional relationship is predicted to be tested in accordance with the research's theoretical framework:

$$G=a + b\ BP + ui$$

Where (G) represents public spending, and (BP) denotes the balance of payments. The (EViews 13) software will be utilized to conduct the econometric tests.

Test Results

1. Unit root test

Table 2. Unit Root Test (PP).

Unit Root Test Results Table (Pp)

Null Hypothesis: the variable has a unit root

At Level	**BP**	**G**	
With Constant	-2.5055	-1.5778	t-Statistic
Prob.	0.1297	0.474	n0
With Constant & Trend	-2.3578	-2.4902	t-Statistic
Prob.	0.3869	0.3283	n0
Without Constant & Trend	-2.1367	0.4855	t-Statistic
Prob.	0.0346	0.8105	n0

At First Difference

At First Difference	**d(BP)**	**d(G)**	
With Constant	-5.7212	-5.1724	t-Statistic
Prob.	0.0002	0.0007	***
With Constant & Trend	-6.5238	-5.5391	t-Statistic
Prob.	0.0000	0.0000	***
Without Constant & Trend	-5.8758	-6.1870	t-Statistic
Prob.	0.0000	0.0001	***

The table is prepared by the researcher based on the analysis results from EViews 13.

Table (2) shows that the G variable becomes stationary at the first difference, whether with a constant or with a constant and trend, while the BP variable stays stationary at the level, according to the Phillips-Perron (PP) technique unit root test for the research variables. The ideal lag length is then ascertained as follows:-

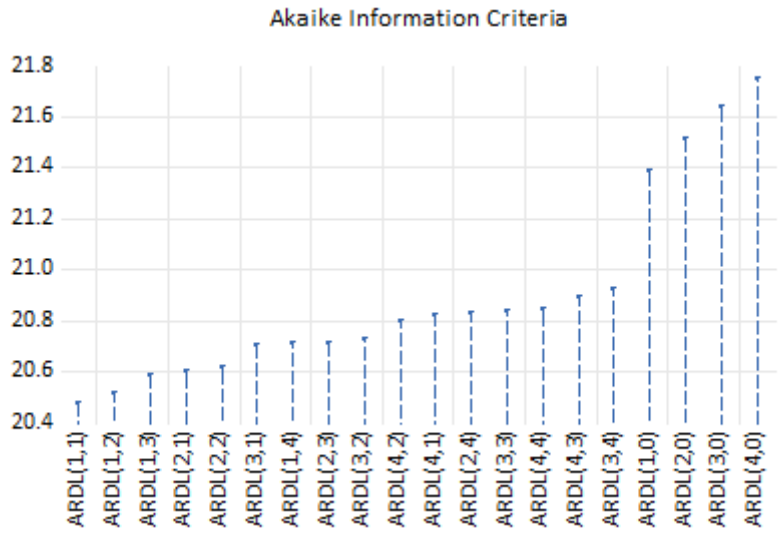

Figure 1. Determining the Optimal Lag Length.

The researcher created the figure using the EViews 13 analysis results.

It is clear from Figure (1) that Lag 1 is the ideal lag duration for the model.

2. The ARDL model for cointegration

Table 3. ARDL Model Results for Cointegration.

Variable	Coefficient	Std. Error	t-Statistic	Prob.*
BP (-1)	0.359455	0.147587	2.435545	0.0278
G	0.544783	0.109095	4.993662	0.0002
G (-1)	-0.588440	0.105307	-5.587828	0.0001
C	3762.799	4344.287	0.866149	0.4001
R-squared	0.72			
Adjusted R-squared	0.66			
F-statistic	13.01			
Durbin-Watson stat	1.46			

The table is prepared by the researcher based on the analysis results from EViews 13

Table (3) presents the results of the Autoregressive Distributed Lag (ARDL) model. It shows that **BP(-1)** is significant at the 5% level based on its **p-value**. Similarly, **G** and **G(-1)** are also statistically significant. The explanatory power of the model, represented by **R-squared (R^2 = 0.72)**, indicates that 72% of the variations in the dependent variable are explained by the independent variable included in the estimated model, while the remaining 28% are attributed to other factors outside the model.

A decent match is shown by the Adjusted R-squared value of 0.66. Furthermore, the model's overall significance is confirmed by the computed F-statistic value of 13.01, which is significant at the 5% level. As a result, we accept the alternative hypothesis and reject the null hypothesis.

3. Bound testing

Table 4. Bounds Test.

Test Stat.	**Value**	**K**
F- Stat	6.68	1
Signi	10 Bound	11 Bound
%5	4.09	4.66

The table is prepared by the researcher based on the analysis results from EViews 13

Table (4) shows the results of the Bounds Test. We find that the computed value of the F-statistic is 6.68 at the 5% significance level, which is greater than the upper critical threshold. Consequently, public spending has a significant effect on the balance of payments over time.

4. Testing for autocorrelation and heteroskedasticity issues

Table 5. Test for Serial Correlation and Heteroskedasticity.

Breusch-Godfrey Serial Correlation LM Test & Heteroskedasticity Test: ARCH

Test	**F-statistic**	**Obs*R-squared**	**Probability**
Breusch-Godfrey Serial Correlation LM Test	1.213979	1.516079	0.2891
Heteroskedasticity Test: ARCH	0.363628	0.399990	0.5550

The table is prepared by the researcher based on the analysis results from EViews 13.

Table (5) and the outcomes of the Breusch-Godfrey Serial Correlation LM Test demonstrate that the p-values for the F statistic and Chi-Square are not significant at the 5% level. This suggests that there is no problem or association, which is the null hypothesis.

Regarding the Heteroskedasticity Test: ARCH, it indicates that the model is free from issues of non-stationarity or heteroskedasticity. The computed p-values for the F statistic and Chi-Square, which are not significant at the 5% level, show that the estimated model does not exhibit non-stationarity or heteroskedasticity issues.

As shown in Figure (2), the results of the normality test indicate that the p-value (Prop) is greater than 5%, suggesting that the model is free from issues.

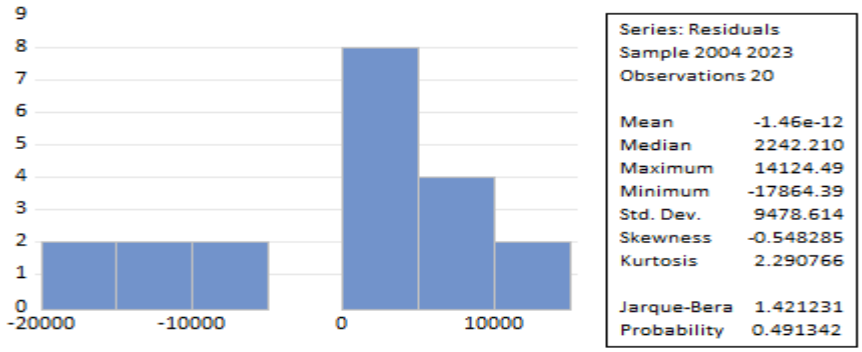

Figure 2. Normal Distribution

The figure is prepared by the researcher based on the analysis results from EViews 13

This is also demonstrated in Figure (3), which shows the stability of the model at the 5% significance level.

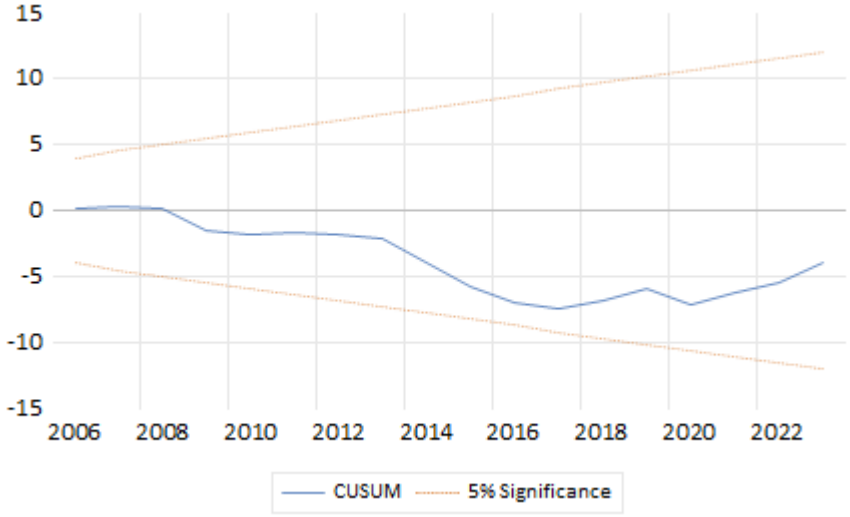

Figure 3. Stability Test.

The figure is prepared by the researcher based on the analysis results from EViews 13.

5. Estimation of the Error Correction Model (ECM)

Table 6. Error Correction Model

Error Correction Model (ECM)

ECM for the Short Run

Variable	Coefficient	Std. Error	t-Statistic	Prob.
D(G)	0.544783	0.109095	4.993662	0.0002
CointEq(-1)	-0.640545	0.147587	-4.340123	0.0006

ECM for the Long Run

Variable	Coefficient	Std. Error	t-Statistic	Prob.
G	-0.068156	0.112916	-0.603593	0.5551
C	5874.368040	6811.579210	0.862409	0.4020

The table is prepared by the researcher based on the analysis results from EViews 13.

The Error Correction Model is shown in Table (6), which shows that the error correction parameter is significant at the 5% level. Given that the rate of adjustment is high, this implies that the two variables have a short-term connection.

5. CONCLUSIONS

1. Public spending is a fundamental and important variable in the economy due to its significant and effective impacts on any country's economy.
2. Public expenditure indirectly impacts the balance of payments by influencing aggregate demand, leading to an increase in imports. This, in turn, negatively affects the balance of payments, resulting in a deficit. This highlights the crucial role of government spending in overall economic performance.
3. The empirical results show a positive direct relationship in the short run between public spending and the balance of payments in Iraq.

RECOMMENDATIONS

1. The government should pay attention to revenue sources, as they eventually translate into expenditures. Given that Iraq heavily relies on oil revenues to cover public spending, it is essential to diversify the economy and not rely solely on oil revenues to fund both consumption and investment expenditures.
2. Strengthening public investments in productive sectors is necessary to enhance financial balance and promote transparency in the management of public resources, which will positively impact the balance of payments.
3. The government should improve the efficiency of spending to stimulate growth and reduce the deficit in the balance of payments.

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