

The Impact of Budget Deficit on Selected Macroeconomic Variables

A Case Study

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Abstract

We will study the effect of the Palestinian Government's Budget Deficit on its economy using a number of selected macroeconomic variables. The purpose of this paper is to investigate the effect of the budget deficit on the unemployment rate, inflation, and real Gross Domestic Product (GDP) per capita. The data were collected from the Palestinian Central Bureau of Statistics covering the period from 1996 to 2022. The Vector Error Correction Model (VECM) was used to analyze the data. The results indicated that there is no short-term relation between the variables; however, in the long run, there is a relation between the variables. According to the VECM, the budget deficit has a negative cause-and-effect relation with unemployment. Meanwhile, the budget deficit has a positive effect on the inflation rate. Finally, the budget deficit has a negative effect on real GDP per capita.

Keywords

Budget Deficit, Macroeconomic Variables, Palestinian Economy, Vector Error Correction Model

Introduction

In 1994, the Palestinian Authority was created to govern the West Bank, Gaza Strip, and run the affairs of Palestinians located throughout the historic land of Palestine. The aim was to develop this government into a separate entity and break away from the Israeli occupation by manifesting This paper will attempt to analyze the economic sustainability of the Palestinian Government over time and its effect on the standard of living of the Palestinian people. We will only look at economic matters and avoid political changes that might occur.

The nexus between budget deficit and macroeconomic variables such as unemployment, inflation, and economic growth has long been a subject of intense debate and empirical scrutiny among economists. This interplay has even greater significance in the context of developing economies, where fiscal imbalances and macroeconomic instability can pose formidable challenges to growth and development. Fiscal imbalance is a primary challenge for many policymakers worldwide (Hassan and Kalim, 2012). One such economy is Palestine, a region beset with a myriad of economic and political complexities.

The Palestinian Government – unlike other governments in the world – has no sovereignty over borders, natural resources, or military independence. As a result of the Israeli occupation, the Palestinian Government's role is limited; thus, it is difficult for such an entity to survive and grow independently. The Israeli occupation has succeeded in creating a semi dependent economy on the Israeli economy, i.e., the Palestinian economy is heavily dependent on the Israeli economy. Israel had managed to keep control of borders, resources, and movement within the Palestinian territories. It maintained an iron grip on both the West Bank and Gaza. This created a situation where the Palestinian Government cannot function freely. In other words, it is exceedingly difficult for the Palestinian Government to function properly and efficiently, creating a situation where it is most likely that this government will constantly have a budget deficit. The purpose of this paper is to examine the cause-and-effect relationships between the budget deficit and unemployment, inflation, and real Gross Domestic Product (GDP) per capita. This will aid policymakers in understanding the consequences of a budget deficit.

A case study will shed light on the intricate dynamics of these economic factors within a unique geopolitical context (Khalidi and Taghdisi-Rad, 2009; Awwad and Zidan, 2021). The motivation of this study is to examine whether economic theory would hold in an environment characterized by volatility, uncertainty, complexity, and ambiguity (VUCA). In addition, due to the Israeli occupation restrictions, the Palestinian Government is expected to experience a constant budget deficit. This is because Israel controls come of the tax withholdings of the Palestinian Government. It uses these withholdings to pressure the Palestinian Government in conducting its own agenda (Hillis, 2021). So, this paper will investigate the effect of a constant budget deficit on the standard of living of the Palestinian people and the well-being of its economy.

A fiscal deficit occurs when the current expenditure exceeds the current income. A fiscal deficit is beneficial if it achieves the targeted goals such as promoting economic growth; in other words, it could be a means for achieving a goal. Thus, the target of fiscal deficit should be improving the economic well-being of citizens by stabilizing price levels and promoting economic development (Ubi and Inyang, 2018).

Keynes also stressed in the demand side economy the need for increasing government spending despite exceeding the current income. This is advised to be conducted in periods of depression, for example, during the Great Depression in the 1930s in the United States and the Global Economic Crisis in 2008. This will trigger an increase in the demand for productive goods and reduce unemployment (Anyanwu and Oaikhenan, 1995, Ogboru, 2006).

Similarly, the budget deficit, which is indicative of the fiscal health of an economy, can significantly influence economic variables. A deeper understanding of how these fiscal elements influence unemployment, inflation, and economic growth in Palestine could provide valuable insights for policymakers, scholars, and stakeholders interested in the region's economic development.

Through rigorous empirical analysis, this study hopes to contribute to the existing body of literature on fiscal policy and macroeconomic performance, with a particular focus on the Palestinian context. The findings of this study could guide effective policymaking, foster sustainable economic growth, and alleviate the pressing issues of unemployment and inflation in Palestine.

Let us look at the different macroeconomic variables for Palestine in more detail. Table 1 shows the Palestinian fiscal indicators for the period from 1996 to 2022.

Table 1: The Palestinian Government Fiscal Indicators from 1996 to 2022

Year	Net Revenues	Net Expenditure	Budget Deficit	Current Revenues/Current Expenditures (%)	Government Debt/GDP (%)
1996	937.0	801.9	-135.1	77.8	7.6
1997	1075.4	1020.6	-54.8	93	10.7
1998	1104.7	1134.7	30.0	103.5	13.5
1999	1186.5	1191.1	4.6	99.9	15.2
2000	1449.0	1230.0	-219.0	78.3	20
2001	1122.0	809.0	-313.0	24.9	21.8
2002	987.0	728.0	-259.0	29.2	21.1
2003	1367.0	1099.0	-268.0	60.2	21.4

Year	Net Revenues	Net Expenditure	Budget Deficit	Current Revenues/Current Expenditures (%)	Government Debt/GDP (%)
2004	1403.0	1278.0	-125.0	68.7	23.1
2005	2006.0	1731.0	-275.0	68.70	24.80
2006	1741.0	1775.0	34.0	50.6	22.2
2007	2938.0	2999.0	61.0	63.00	26.40
2008	3758.0	4028.3	270.3	54.40	23.30
2009	2950.4	2795.3	-155.1	53.00	23.90
2010	3032.4	2861.3	-171.1	63.00	21.10
2011	3153.6	3050.3	-103.3	73.50	21.10
2012	3172.3	3086.4	-85.9	73.50	22.00
2013	3677.9	3936.6	258.7	71.40	19.00
2014	4021.7	4436.5	414.8	81.00	17.40
2015	3688.2	3755.0	66.8	83.90	20.00
2016	4318.2	4758.3	440.0	97.00	18.50
2017	4371.9	4691.0	319.1	96.20	15.80
2018	4127.7	4318.6	190.9	94.60	14.60
2019	3782.7	3705.4	-77.3	89.90	16.30
2020	3990.3	3856.8	-133.4	89.20	23.50
2021	4546.1	4889.1	342.9	104.70	21.20
2022	5029.9	5723.6	693.7	112.70	18.50

According to the table above, the budget deficit for Palestine fluctuated over the given period. It reached its lowest point in 2001 when the budget deficit was -USD 313.0 million, which was due to the ongoing second initiative. Meanwhile, it reached its highest point in 2022, registering a surplus of USD 693.7 million. This was due to COVID-19, where government expenditures decreased due to a lack of economic activity. Table 2 shows the macroeconomic indicators for Palestine covering the period from 1996 to 2022.

Table 2: Macroeconomic indicators for Palestine from 1996 to 2022

Year	Unemployment Rate (%)	CPI (2018 = 100)	Real DP per Capita	Real GDP at (2015) Prices
1996	23.8	49.58	2249.2	5483.5
1997	20.3	53.09	2442.2	6287.8
1998	14.4	56.05	2701	7189.1
1999	11.8	59.16	2830.2	7784.4
2000	14.3	60.82	2506.5	7118.4

Year	Unemployment Rate (%)	CPI (2018 = 100)	Real DP per Capita	Real GDP at (2015) Prices
2001	25.3	61.56	2208	6455.6
2002	31.2	65.08	1877.6	5649.4
2003	25.5	67.94	2080.1	6441.2
2004	26.8	69.98	2463.6	7853.4
2005	23.50	72.86	2,659.20	8,740.10
2006	23.7	75.66	2553.3	8653
2007	21.70	77.06	2,570.00	8,980.80
2008	26.60	84.69	2,686.90	9,648.00
2009	24.50	87.02	2,841.90	10,477.10
2010	23.70	90.28	2,929.80	11,082.40
2011	20.90	92.88	3,131.60	12,146.40
2012	23.00	95.46	3,242.10	12,886.90
2013	23.40	97.11	3,314.50	13,492.40
2014	26.90	98.79	3,233.00	13,471.10
2015	25.90	100.20	3,277.90	13,972.40
2016	26.90	99.98	3,489.80	15,211.00
2017	25.70	100.20	3,463.10	15,426.90
2018	26.20	100.00	3,417.70	15,616.20
2019	25.40	101.58	3,378.30	15,829.00
2020	23.40	100.83	2,922.50	14,037.40
2021	26.40	102.08	3,051.50	15,021.70
2022	24.40	105.90	3,086.80	15,612.50

Source: Palestine Monetary Authority <https://www.pma.ps/en/Statistics/TimeSeriesData>

Literature Review

Many studies have discussed the impact of the budget deficit on unemployment, inflation, and economic growth. We will start our review of this literature with Ball and Mankiw (1995), who examined the effects of budget deficits on the economy in four stages. The first stage studied how standard theory looks at the cause-and-effect relationship between budget deficits and saving, investment, the trade balance, interest rates, exchange rates, and long-term growth. The second stage quantitatively measured the extent of some of these effects. Third, it demonstrates the effect of budget deficits on economic welfare. Last, the persistence of the budget deficit of a country might lead to a collapse in the demand for a country's assets. This paper attempted to talk about budget deficits in a theoretical sense and answer the question do these theoretical effects happen in real life? There is a substantial amount of empirical research aimed at finding these effects, but this research has not

definitively confirmed or disproved the theories they discussed. The biggest challenge in producing convincing empirical work is the identification problem. Countries do not implement fiscal policies as controlled experiments; instead, policies evolve over time in response to changing economic conditions. This makes it hard to distinguish the effects of budget deficits from their underlying causes. Nevertheless, the U.S experience was looked at for the past 12 years, then looked at the Latin America experience.

Habibullah, Cheah, and Baharom (2011) studied the long-run relationship between budget deficit and inflation. This study utilized annual data for the period of 1950-1999 for thirteen developing Asian countries. These countries were Indonesia, Malaysia, the Philippines, Myanmar, Singapore, Thailand, India, South Korea, Pakistan, Sri Lanka, Taiwan, Nepal, and Bangladesh. The Granger causality within the error-correction model (ECM) framework indicated that all variables involved (budget deficits, money supply, and inflation) were integrated of order one. The ECM estimates indicate the existence of a long-run relationship between inflation and budget deficits. The paper concluded that budget deficits were inflationary in developing Asian countries.

Ene (2018) examined the effects of variation in the Government Annual Deficit (GAD) on unemployment in Nigeria. This paper utilized an ex-post factor research design. The data was collected from the Central Bank of Nigeria Statistical Bulletin (2017) and publications of the National Bureau of Statistics covering the period from 1997 to 2017. The linear regression and Vector Error Correction Model (VECM) methods were used to estimate the parameters of the model. In addition, diagnostic checks were also conducted to test for heteroskedasticity and serial correlation. The results indicated that GAD has a significant positive effect on the unemployment rate in Nigeria.

Sawyer (2021) reconsiders the writings of Michal Kalecki, who looks at issues of fiscal policy and budget deficits and converges to a full employment state in capitalist economies. The study looks at those writings that focus on the period after the global financial crises relating to recent fiscal policy debates. It examines the relationship between the magnitude of the budget deficit and reaching full employment. This paper also thoroughly discusses Kalecki's approach to the 'burden' of debt. Finally, it revisits reaching full employment given social and political constraints.

Zubdeh (2021) examined the relationships between the budget deficit and gross domestic product, balance of trade, inflation rate, unemployment rate, and current accounts for Palestine. The data used for the paper covers the years 2000-2018. The least square and ARMA methods were used to analyze the data. The results revealed a long run co-integration relationship between the budget deficit and the independent variables. The gross domestic product, the balance of trade, and the unemployment rate had significant negative relationships with the budget deficit. Meanwhile, the remaining variables, inflation rate, and current account, have a significant positive relationship with the budget deficit.

From the above literature reviews, we can notice that budget deficit positively affects inflation and the unemployment rate. However, we will evaluate the validity of this relationship in an unstable political environment. This paper will add to the literature on the effect of the budget deficit on macroeconomic variables in the Palestinian context. We will investigate whether economic theory holds in an unstable environment. Considering the type of data available, the VECM was the most suitable model for statistical analysis. Accordingly, the uniqueness of this paper lies in the fact that the VECM model will be employed to study this cause-and-effect relation.

Theoretical Framework

The concept of fiscal policy, including government expenditure and revenue collection, is foundational in understanding a nation's economic dynamics. A budget deficit, a situation where

government expenditures surpass revenues, has significant macroeconomic implications (Mankiw, 2016).

Now we will discuss the relevant theories that study the cause-and-effect relationship between budget deficit and macroeconomic variables. Keynesian economics, a cornerstone of fiscal policy theory, advocates the use of government spending to manage economic fluctuations (Meltzer, 1981). According to this school of thought, increased government spending can stimulate demand in economic downturns, while decreasing spending can mitigate inflation during economic booms (Blanchard and Leigh, 2013).

Keynesian theory suggests that government spending, even if it leads to deficits, can stimulate economic activity, thereby reducing unemployment, especially during recessions (Eyzaguirre, Ferrarini, and O'Roark, 2019). This study will explore this relationship in the context of Palestine. From a monetarist perspective, large deficits can lead to an increased money supply and, consequently, greater inflation (Friedman, 1968). This framework will investigate the applicability of this theory to Palestine, considering its unique economic constraints.

Theoretical links between government spending and economic performance will be explored to understand how budget deficits impact economic growth and living standards in Palestine (Barro, 1990). Palestine's economy is distinct, marked by political instability, limited monetary policy control, and high dependency on foreign aid (Rothstein, 2015). These factors necessitate an adapted application of fiscal theories.

Based on the theoretical and empirical background, specific hypotheses will be formulated. For example, it might be hypothesized that increased budget deficits in Palestine correlate with higher unemployment rates and affect inflation and GDP per capita (Alesina and Perotti, 1997). The choice of methods, such as the VECM, will be justified by their ability to capture long-term relationships between budget deficits and macroeconomic variables (Johansen, 1995).

Data and Methodology

The data were collected from the Palestinian Monetary Authority and the Palestinian Central Bureau of Statistics. The annual data covered the period of 1996-2022. The VECM approach was used to analyze the data. We will start our analysis to test whether the variables are stationary. The augmented Dickey-Fuller (ADF) test is used to determine whether a time series is stationary. The null hypothesis of the ADF test is that the time series is nonstationary (i.e., it has a unit root), while the alternative hypothesis is that the time series is stationary. A small p value (typically ≤ 0.05) indicates strong evidence against the null hypothesis, so the null hypothesis is rejected. Then, we use the cointegration method to test whether the variables have a long-run relationship. We will also conduct the Granger causality test to determine the direction of the cause-and-effect relationship. Finally, we use the VECM to estimate the magnitudes of the parameters. Theoretical Support for Methods: The choice of methods, such as the VECM, will be justified by their ability to capture long-term relationships between budget deficits and macroeconomic variables (Johansen, 1995).

Results

R software was used to analyze the data. We started our analysis by determining whether each of the variables was stationary, i.e., we used the ADF test to determine whether each variable was unit-free. Here are the results of the unit root test for each variable.

Table 3: Results of the ADF test

Variable	Lag Order	P value
Budget Deficit	2	0.02099408
Unemployment Rate	2	0.01
dCPI	0	0.0164589
dGDPC	1	0.04446986

Notes:
dCPI = Consumer Price Index at 1st difference
dRGDPC = Real Gross Domestic Product per Capita at 1st difference

Table 4: Results of the Unit Root Test

Variable	Stationary/Non-Stationary
Budget Deficit	Stationary at 1 st Difference
Unemployment Rate	Stationary at 1 st Difference
CPI	Stationary at 1 st Difference
RGDPC	Stationary at 1 st Difference

According to the cointegration test results, the null hypothesis ($r = 0$) can be rejected at the 1% significance level because the test statistic (55.91) is greater than the critical value (55.43). This implies that there is at least one cointegrating relationship among these variables.

Looking at the rows corresponding to $r \leq 1$, $r \leq 2$, and $r \leq 3$, we can see that their test statistics are less than the 1% critical value. Therefore, we fail to reject these null hypotheses, suggesting that there is only one cointegrating relationship among the variables.

The cointegration relationship among the variables, as suggested by the eigenvectors (normalized to the first column), can be written as follows:

$$-1330.31 \times \text{Unemployment.12} - 3275.33 \times \text{dCPI.12} + 51.07 \times \text{dGDP.12} = \text{Deficit.12}$$

The loading matrix or the adjustment coefficients provide insights into how quickly the variables converge toward equilibrium. Here, the adjustment is highest for the 'Deficit' variable, implying that 'Deficit' adjusts the fastest toward equilibrium when there is a disturbance.

Table 5: Eigenvalues (lambda)

Lambda	Value
1	0.707554
2	0.4505128
3	0.3518683
4	0.0654799

Table 6: Test statistics and critical test values

Hypothesis	Test Statistic	10% Value	Critical	5% Value	Critical	1% Value	Critical
$r \leq 3$	1.63	6.5		8.18		11.65	

$r \leq 2$	12.03	15.66	17.95	23.52
$r \leq 1$	26.4	28.71	31.52	37.22
$r = 0$	55.91	45.23	48.28	55.43

Table 7: Eigenvectors, normalized to the first column (cointegration relations)

	Deficit.l2	Unemployment.l2	dCPI.l2	dGDP.l2
Deficit.l2	1	1	1	1
Unemployment.l2	-1330.31047	2492.24409	-13.3944161	6.933584
dCPI.l2	-3275.33189	2204.70038	200.7365866	-58.5393477
dGDP.l2	51.06562	49.47337	-0.6968707	-0.2802321

Table 8: Weights (Loading Matrix):

	Deficit.l2	Unemployment.l2	dCPI.l2	dGDP.l2
Deficit.d	-0.008136612	-0.0037707889	-0.395076845	-0.1220471412
Unemployment.d	0.0000655217	-0.0001683413	0.0014832	-0.0007197549
dCPI.d	-0.00001769596	-0.0000469467	-0.00259712	0.0009940016
dGDP.d	-0.02410575	-0.0015043913	0.006746078	0.0148687377

Therefore, the results suggest that these variables have one cointegrating relationship, meaning that the order of cointegration is one. This implies that there exists a long-run equilibrium relationship between the variables. The following are the results from the Granger causality tests:

Table 9: Results from the Granger Causality Tests

Test	p value	Result
Deficit -> Unemployment	0.5431	No Granger Causality
Unemployment -> Deficit	0.9302	No Granger Causality
Deficit -> CPI	0.01145	Granger Causality
CPI -> Deficit	0.2772	No Granger Causality
Deficit -> RGDP	0.04134	Granger Causality
RGDP -> Deficit	0.9521	No Granger Causality

According to the table above, Deficit does not Granger-cause Unemployment and vice versa. This means that past values of Deficit do not help predict current Unemployment values and that past Unemployment values do not help predict current Deficit values. Moreover, Deficit Granger causes CPI ($p < 0.05$), suggesting that past values of Deficit help predict current CPI values, while the reverse is not true. Similarly, deficit Granger causes RGDP ($p < 0.05$), suggesting that past values of deficit help predict current RGDP values, while the reverse is not true.

Let us look at the results from the VECM.

Table 10: Eigenvalues (lambda) and Critical Values of the Test

	Eigenvalue	Test Statistic	10% Critical Value	5% Critical Value	1% Critical Value
$r \leq 3$	0.1750644	4.62	7.52	9.24	12.97
$r \leq 2$	0.3685579	15.65	17.85	19.96	24.6
$r \leq 1$	0.5992301	37.6	32	34.91	41.07
$r = 0$	0.7304829	69.06	49.65	53.12	60.16
Not Used	0	-	-	-	-

Table 11: Eigenvectors (normalized to the first column)

	Deficit.I1	Unemployment.I1	CPI.I1	RGDPC.I1	Constant
Deficit.I1	1	1	1	1	1
Unemployment.I1	-255.08167	-4296.8436	1.116179	-184.779767	-24.6279423
CPI.I1	89.4372	-6061.3147	-1.812429	82.383478	21.7647237
RGDPC.I1	-3.958228	262.5004	-0.401012	-2.709673	-0.3999373
Constant	11022.85768	-162008.616	1295.525062	4790.727628	-7.4105172

Table 12: Weights (loading matrix)

	Deficit.I1	Unemployment.I1	CPI.I1	RGDPC.I1	Constant
Deficit.d	0.114057424	-0.001217747	-0.7446723609	0.0120203069	2.44E-16
Unemployment.d	0.002677317	0.00001648241	-0.0005605934	0.0012789656	2.65E-17
CPI.d	0.001828048	-0.000006388319	0.0016989371	-0.0006460614	-5.94E-18
RGDPC.d	-0.018037136	-0.001731193	0.2427628735	0.0524826219	-2.75E-15

Table 13: VECM Coefficients

	Deficit.d	Unemployment.d	CPI.d	RGDPC.d
ect1	0.11405742	0.002677317	0.0018280482	-0.018037136
Deficit.dI1	-0.04195279	-0.005310956	-0.0006839599	0.219137655
Unemployment.dI1	-5.68324323	0.317258848	0.2510493342	-18.47940957
CPI.dI1	-55.03252893	-1.24185259	-0.1844313108	23.50048133
RGDPC.dI1	0.08091027	0.003116319	0.0057599483	-0.003472417

Table 14: Estimated Cointegrating Relations (Long-term Equilibrium)

	ect1
Deficit.I1	1
Unemployment.I1	-255.08167
CPI.I1	89.4372
RGDPC.I1	-3.958228
Constant	11022.85768

Table 15: One-step ahead Forecast

Variable	Forecast	Lower Bound	Upper Bound	CI
Deficit	609.9778	225.6461	994.3095	384.3317
Unemployment	25.03013	19.90414	30.15612	5.125988
CPI	109.8734	106.9371	112.8096	2.936269
RGDPC	3496.669	3192.873	3800.465	303.7959

Please note that the lower and upper bounds represent a confidence interval around the forecast when meant not to have a budget deficit. It is also reported in the 'CI' column. If the actual future value falls within this interval, the forecast can be considered accurate.

Conclusion

This paper aimed to investigate the effect of the existence of a budget deficit for the Palestinian Government on the economy. We had demonstrated how it is extremely difficult, due to the Israeli occupation, for the Palestinian Government not to have a budget deficit. Therefore, this paper aimed to show how the Palestinian economy can survive given the existence of a permanent budget deficit. We chose three macroeconomic variables to assess the effect of a Palestinian budget deficit on the economy: GDP per capita, inflation, and unemployment. Our results indicated that the Palestinian budget deficit has a long-run negative effect on the unemployment rate and GDP per capita. Thus, as the budget deficit increases, the GDP per capita of the Palestinians decreases, i.e., an increase in the budget deficit lowers the standard of living of the individual Palestinian. Although an increase in the budget deficit is lowering unemployment, it is apparent that the jobs generated from the deficit are low-paying jobs that are not leading to an increase in the standard of living. This might be because the jobs created from the increase in the budget deficit are low-paying government jobs. At the same time, an increase in the budget deficit has a long-run positive effect on inflation, i.e., as the budget deficit increases, the inflation rate increases. This is of course very harmful for the economy since the Palestinian Government lacks the tools to control inflation. This is due to the absence of a monetary policy because of the conditions that evolved from the Israeli occupation.

Our results match the findings of Zubdeh (2021), where an increase in the budget deficit is both lowering the standard of living of the individual Palestinian and increasing the price level in the economy, i.e., it is making the lives of the Palestinians extremely difficult. This is why it is recommended that policymakers try their best efforts to prevent a further increase in the budget deficit.

The limitation of this paper lies in the short duration of the period considered in the analysis. The results would have been more robust with a longer time series. Additionally, integrating more variables into the analysis would have provided a better understanding of how the budget deficit affects the living conditions of Palestinians. For example, examining how the budget deficit influences the poverty level in Palestine could offer valuable insights. This paper paves the way for future research to study the magnitude of the budget deficit's impact on macroeconomic variables and, consequently, how it directly affects the standard of living for Palestinians. Furthermore, exploring potential strategies to avoid a budget deficit under the current circumstances would be a compelling topic for future investigation.

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