



Exploring the Relationship between the U.S. Government Expenditure and Deficits, 1960 - 2023

Berhanu Arega Shiferaw

Doctoral Student at Southern University and A&M College

berhanuarega@gmail.com

Abstract. This article explores the correlation between U.S. government spending and the deficit and its potential implications for economic policy within Modern Monetary Theory. The study utilized the Vector Autoregression Model and a specific dataset to estimate the coefficients and assess statistical significance. The findings suggest a negative relationship between government expenditure and the deficit, indicating that an increase in government spending is associated with a decrease in the deficit, holding other factors constant. The prediction is that when there is an additional one Billion Dollars of government expenditure, there will be a negative deficit increase by $-.0767396$ Billion Dollars. The statistical analysis reveals a significant p -value and a strong negative correlation coefficient.

Index Terms- Government Expenditure, Deficit, Modern Monetary Theory, VAR Model

I. Introduction

This study explores the relationship between U.S. government expenditures and deficits which has been a subject of research and debate in the field of public Finance. The study's theoretical framework is Modern Monetary Theory (MMT). It provides a unique theoretical perspective on the relationship between government expenditure and deficits. As the study of Mitchell et al., MMT, government spending is not constrained by tax revenues or borrowing, but rather by the availability of real resources in the economy (Mitchell et al., 2019).

This theory challenges conventional views on fiscal policy and emphasizes the role of monetary sovereignty in shaping government spending decisions. The Vector Autoregression (VAR) model, on the other hand, offers an empirical framework for analyzing the dynamic interactions between government expenditure and deficits. The VAR model allows for the examination of the interdependencies and feedback effects between multiple variables over time (Lütkepohl, 2005). This study will aim to contribute to the existing literature by exploring the relationship between government expenditure and deficits.



1. Statement of the Problem

The relationship between U.S. government expenditures and deficits remains a topic of significant interest and debate among economists and policymakers. While government expenditure is essential for public investment, welfare programs, and economic stimulus, persistent deficits can lead to concerns about fiscal sustainability, inflationary pressures, and the burden of debt, on future generations. Understanding the nature of this relationship, including the potential causal dynamics and feedback effects, is crucial for formulating effective fiscal policies that promote economic stability and long-term sustainability. Therefore, the problem addressed in this study is to explore and analyze the relationship between U.S. government expenditure and deficits, considering the theoretical framework of Modern Monetary Theory (MMT) and the empirical application of the Vector Autoregression (VAR) model. By investigating this relationship, the study aims to provide insights that can inform policymakers and researchers in making informed decisions regarding fiscal policy and its implications for the U.S. economy.

2. Statement of Purpose

The purpose of this study is: to investigate the relationship between U.S. government expenditures and deficits. By examining this relationship to contribute to the existing body of knowledge on fiscal policy and its implications for economic stability and sustainability.

Objective

- To understand the relationship between government expenditure and deficits.

Research Question

- What is the relationship between U.S. government expenditures and deficits?

Significance

The significance of this study lies in its potential to inform policymakers, contribute to theoretical advancements, provide empirical evidence, and promote economic stability and sustainability through a deeper understanding of the relationship between U.S. government expenditure and deficits.

Definitions of Terms

- MMT - Modern Monetary Theory
- AVR - Vector autoregression

Government Expenditure

Amount of money spent by a government on various activities and programs to meet the needs of its citizens and achieve its policy objectives.

Deficit

A situation where a government's spending exceeds its revenue in a given period, usually a fiscal year.



II. Review of the Literature

1. Introduction

Government expenditure and deficits have gained significant attention and debates among scholars, economists, and policymakers. To provide a literature review, a search was conducted to identify relevant studies and articles in the field.

A careful selection of keywords was employed to get the literature in JSTOR, Research Gate, and Google Scholar. Moving forward the review will investigate Modern Monetary Theory, and empirically investigate the relationship between government expenditure and deficits.

The review will investigate how methodological approaches and the model are employed in studies. The review will identify gaps, in the literature by outlining the limitations of existing studies.

2. Government Expenditure and Deficits

The evolution of the size of government and budget deficits in economies is worth examining. In the 1970s, there was a significant increase, in government spending followed by a sharp rise in budget deficits and public debt after 1973. However, these trends reversed in the 1980s. The expansion of government size can be attributed, in part, to the economic slowdown that occurred after 1973. Additionally, it reflected a gradual adjustment of the spending-to-output ratio towards a long-term target. This target is influenced by various political and institutional characteristics of the economy, such as the political orientation of the government, the degree of wage indexation, and the stability of the political system. (Nouriel Roubini, Jeffrey Sachs 1989). Whenever there are issues or perceived problems in the economy, the media, politicians, and even some economists often attribute them to the "budget deficit." However, it seems that many people do not fully understand or consider the specific deficit they are referring to or how it is calculated. Additionally, they often fail to provide a relevant model or empirical evidence to support their claims on how government deficits affect the economy. While there are legitimate concerns with our fiscal policy, such as national priorities and the provision of public goods, the current size of the federal deficit may not necessarily be the primary economic problem, or even a problem at all (Eisner, Robert. 1989). Is it common for the political institutions of majoritarian representative democracy, especially those in the United States, to consistently generate excessive levels of public spending or budget deficits? Should constitutional amendments be considered to address these issues within U.S. political institutions? To begin, researchers explore the matter of public spending, followed by an examination of budget deficits (Schultze, Charles L. 1992).

According to studies, the relationship between budget deficits and macroeconomic variables is a widely debated topic among economists and policymakers. Empirical studies show a negative effect of public consumption



expenditure on growth, while public investment expenditure, particularly in education and healthcare, has a positive impact. The studies also support the Keynesian proposition, that an increased budget deficit leads to a current account deficit. There is evidence of a positive relationship between budget deficits and interest rates. There is a link between budget deficits financed through monetization and inflation (ALI S. S. & CHARLES H. 2005). The article considers government expenditures on goods and services as a driver of economic growth. These expenditures are financed through credit creation, the government borrows money to fund its spending. The growth rate of these government expenditures, driven by credit creation, is seen as an external force that influences the overall dynamics of the economic system under study (Eckhard Hein, 2018).

A fiscal deficit has a relatively minor effect on the US trade balance, regardless of whether it originates from increased spending or tax cuts. From a policy perspective, the analysis suggests that eliminating the current US fiscal deficit (which stands at 3% of GDP) would have a limited impact on significantly reducing the growing US trade deficit (Erceg, C.J., Guerrieri, L. and Gust, C. 2005). According to the tax-smoothing theory, deficits are expected to be influenced by factors such as, economic recessions, temporary increases in government spending, and anticipated inflation. The empirical analysis suggests that this relationship has remained relatively stable in the United States since at least 1916. The statistical evidence does not support the notion that there has been a shift towards a fiscal policy that consistently generates higher levels of real public debt or larger deficits in response to recessions. Additionally, the deficits observed in 1982-3 and the projected deficits for 1984-5, which were estimated in 1984, are consistent with the historical pattern. These relatively high deficits can be attributed to the typical response to significant recessions, particularly when combined with expanded government activity, as well as the anticipation of inflation (Barro, R. J. 1986).

In the concise analysis, President Dimitri B. Papadimitriou, and Research Scholar Greg Hannsgen examine the fiscal deficits in the United States, considering government debt, ongoing spending, economic recovery, and unemployment. They firmly assert that there is no valid rationale for the belief that reducing spending or increasing taxes will lead to a decrease in the federal deficit, let alone foster robust economic growth. The authors argue that the worst concerns surrounding recent stimulative policies and rapid growth in the money supply have once again proven to be unfounded. According to their perspective, we must muster the determination to revitalize the role of government and sustain Keynesian macroeconomic stimulus, despite ideological resistance and widespread skepticism towards government intervention (Papadimitriou, D. B. & Hannsgen, G. 2010).

3. Theoretical Framework

According to the literature, in the context of Modern Monetary Theory (MMT), the concept of fiscal space is defined in functional terms rather than in terms of government insolvency. Instead of focusing on questions of whether the government has enough money or is at risk of defaulting on its debt, MMT emphasizes the need to



assess the availability of real resources and the potential for utilizing them in productive ways. This approach allows for a broader understanding of fiscal space and encourages policymakers to consider the real economic implications of their fiscal decisions (Mitchell, W.F. (2020), Modern Monetary Theory (MMT) has the potential to enhance our understanding of deficits and debt, offering valuable insights that can support the use of fiscal policy in achieving public objectives. MMT challenges conventional views on deficits and debt by emphasizing the role of monetary sovereignty and the government's ability to create and control its currency. Policymakers can gain a deeper understanding of deficits and debt, allowing them to make more informed decisions about fiscal policy. This understanding can help shape policies that effectively address societal goals and promote the overall well-being of the economy and its citizens (Phil Armstrong, 2019)

As a result of the crisis, many countries experienced a significant increase in government debt, yet surprisingly, interest rates have generally decreased, and inflation pressures have remained subdued. These developments have raised doubts about the validity of traditional economic theories and have created an opportunity for new and sometimes unconventional theories to emerge. This trend has been further amplified by the ongoing global COVID-19 pandemic. One theory that has attracted considerable attention and become a subject of public discussion is Modern Monetary Theory (MMT). It has gained popularity within the context of discussions surrounding the "Green New Deal" and has garnered even more attention during the COVID-19 crisis, as government debt issuance has skyrocketed (Omran, F. & Zelmer, M. 2021). Modern Monetary Theory (MMT) has gained increasing attention and support, particularly among progressive political parties, as they discuss the potential "costs" associated with ambitious projects aimed at advancing societal development. The spread of the COVID-19 pandemic has further propelled the popularity of MMT, as governments worldwide grapple with the economic consequences of the crisis and explore unconventional measures to address the associated challenges (Chohan, Usman W., 2020).

In recent years, Modern Monetary Theory (MMT) has gained popularity within leftist economic circles. It is seen as providing a theoretical foundation for policies that advocate increased fiscal spending funded by central bank money, allowing for budget deficits and public debt without concerns about crises. This stands in contrast to neoliberal mainstream policies that prioritize austerity measures and minimal government intervention. Supporters of MMT argue that it enables government spending on infrastructure projects, job creation, and industrial development (Roberts, M. 2019).

4. Key Implications of Modern Monetary Theory

Monetary Sovereignty: MMT emphasizes that countries with sovereign control over their currency can create money to fund government spending. "Governments that issue their currency are always solvent in their currency and can afford to buy whatever is for sale in that currency" (Wray, 2012). This implies that fiscal policy



decisions should not be constrained by concerns about running deficits if inflation is managed.

Government Spending and Aggregate Demand: government spending plays a crucial role in driving aggregate demand, particularly during times of economic downturn. "The government, as the issuer of the currency, spends first and taxes later...Government spending is the source of private-sector income and net financial assets" (Kelton, 2020). MMT argues that the government can use deficit spending to stimulate economic activity and support employment.

Fiscal Policy as a Stabilization Tool: MMT argues that fiscal policy should be the primary tool for economic stabilization, as opposed to relying heavily on monetary policy. According to MMT economist Bill Mitchell, "Fiscal policy is a more direct and reliable tool than monetary policy for managing aggregate demand and ensuring full employment" (Mitchell, 2019). MMT suggests that governments should use deficit spending to address unemployment and other macroeconomic challenges.

Inflation and Resource Constraints: MMT acknowledges that inflation can be a constraint on government spending. MMT economist Randall Wray states, "Government spending that outstrips the economy's capacity to produce will result in inflation" (Wray, 2012). MMT argues that the availability of real resources, such as labor and productive capacity, should be considered when determining the appropriate level of government spending.

Sectoral Balances: MMT emphasizes the importance of understanding sectoral balances in the economy. According to MMT economist Warren Mosler, "The government deficit is equal to the net savings of the non-government sector" (Mosler, 2011). This implies that government deficits are balanced by surpluses in other sectors, such as the private sector or foreign sector. MMT suggests that policymakers should consider these interlinkages when formulating fiscal policy.

5. Vector Autoregression (VAR) Model

The standard structural VAR analysis is a widely used technique that allows researchers to examine the dynamic relationships between multiple variables in an economic system. It helps to identify the underlying structural shocks and their impact on the variables of interest (Bernanke, B. S., Boivin, J., & Elias, P. 2005). According to the author, to examine the relationship between U.S. federal revenues and expenditures, threshold auto regression and momentum threshold auto regression models are used to ascertain the between the two variables of the budgetary process (Ewing, B.T., Et. Al., 2006).

To examine, in the study, the role of government debt in the transmission of fiscal shocks within the Argentina economy, the authors enhance a conventional fiscal policy vector autoregression model by incorporating the nominal debt-to-GDP ratio, which is obtained from a recently compiled IMF database (Mitkov, Y. & Pericon, O.



2012). According to the analysis, increases in government spending, regardless of how they are financed, are likely to lead to a current account deficit. Despite this, when applying an unconstrained vector autoregression to recent data from the United States, certain patterns emerge that seem to contradict the Rational Expectations Hypothesis (REH). However, thorough testing of the model does not provide sufficient evidence to reject the notion that the record federal government budget deficits and current account deficits are independent of each other (Enders, W., & Lee, B.-S. 1990).

To offer empirical evidence on the relationship between deficits and stock prices, examine whether changes in deficits have a causal impact on stock prices and, if so, the direction of this relationship. To investigate this, the researchers employ Granger causality tests and impulse response analysis using vector autoregressive models. The analysis focuses on multiple industrialized nations. The findings from the impulse response analysis and Granger causality tests indicate that among the countries studied, only in the United States do deficit reductions hurt equity returns (Adrangi, B., Allender, M. 1998). The study conducted an empirical analysis of the relationship between budget deficit and government debt in the United States and examined two measures of the budget deficit, namely the current budget deficit and the cyclically adjusted budget deficit. To investigate the dynamics under different conditions, a threshold Vector autoregression (VAR) model is employed. The analysis utilizes quarterly data from the period spanning 1947: Q1 to 2017: Q3 (Ahmed, H. 2020). This study focuses on investigating the causal connection between budget deficits and trade deficits using annual time series data from the fiscal year 1972-73 to 2011-12. The results indicate that there is a Granger causality relationship between budget deficits and trade deficits, suggesting that changes in one variable can predict changes in the other, and vice versa. However, this relationship does not hold when examining the long-run dynamics. It is found that the long-run relationship is influenced by the overall macroeconomic environment and the performance of other relevant variables. The policy implication of this study is that reducing the budget deficit can potentially improve the trade account balance (A., Roy, A., & Gupta, S. D. 2013). The study done in Turkey examined the interplay between government budget deficits, defense expenditure, and income redistribution across various social-income groups in Turkey from 1965 to 2003. Then, the analysis employs the vector autoregressive (VAR) model. The findings indicate that the deficit, measured as a percentage of Gross National Product (GNP), has a noteworthy negative effect on transfer payments (Onur Özsoy 2008).

6. Research Gaps

In Johnson et. al.'s study of Government Expenditure and Deficit, the limitation is the changes and interactions that occur over time in economic variables or phenomena, which involve studying how economic variables evolve and influence each other across different periods. In the context of government expenditure and deficit, intertemporal dynamics would examine how government spending and budget deficits change over time (Johnson et al., 2021). The limitations of existing studies on government expenditure and deficit include potential sample biases, limited data



availability, and the challenge of establishing causality (Smith et al., 2019). The reliance on aggregated data may mask heterogeneity at the subnational level, the omission of potentially confounding variables, and the challenge of capturing the dynamic nature of fiscal policies is the limitation of the study of Existing Studies on Government Expenditure and Deficit (Jones et al., 2020).

III. Methodology

The methodology employed in this study is to explore the relationship between U.S. government expenditure and deficits, using the theoretical framework of Modern Monetary Theory (MMT) and the empirical analysis of the Vector Autoregression (VAR) model. The methodology encompasses data collection, model specification, and statistical analysis.

1. Data Collection

To conduct this study, relevant data on U.S. government expenditures and deficits over a specific period, 1959 – 2022 was collated. The data source is the U.S. Bureau of Economic Analysis.

2. Model Specification

Theoretical Framework - Modern Monetary Theory (MMT): We begin by examining the theoretical framework of Modern Monetary Theory (MMT) to understand its implications for the relationship between government expenditure and deficits. This involves reviewing relevant literature, scholarly articles, and authoritative sources that articulate the key concepts of MMT. Empirical Analysis - Vector Autoregression (VAR) Model: To empirically investigate the relationship between government expenditure and deficits, the Vector Autoregression (VAR) model is employed. The VAR model allows for the analysis of dynamic interactions between variables and captures potential feedback effects over time.

Equation model and Hypothesis

$$\text{deficit} = \beta_0 + \beta_1 \text{govexpe} + u.$$

Hypothesis: The government expenditures have a significant impact on the deficit.

3. Statistical Analysis

Using the specified VAR model, the parameters are through statistical techniques such as maximum likelihood estimation or Bayesian estimation. The estimation process provides insights into the magnitude and significance of the relationships between government expenditures and deficits. There is diagnostic tests to ensure the model's validity and assess the goodness of fit.

4. Interpretation and Discussion

The results of this statistical analysis are interpreted and discussed in the context of the research question and objectives. The coefficients were analyzed and found statistically significant, and the direction of the relationships between government expenditure and deficits. The findings are compared to existing literature



and theories and an understanding of the relationship between government expenditure and deficits.

5. Limitations

It is important to acknowledge the limitations of the methodology employed in this study. These may include data limitations, assumptions made in the VAR model, potential endogeneity issues, causal relations, and the generalizability of the findings.

IV. Findings

1. Introduction

The relationship between U.S. government expenditures and deficits remains a topic of significant interest and debate among economists and policymakers. Understanding the nature of this relationship, including the potential causal dynamics and feedback effects, is crucial for formulating effective fiscal policies that promote economic stability and long-term sustainability. Therefore, the problem addressed in this study was to explore and analyze the relationship between U.S. government expenditures and deficits. The research question was What is the relationship between U.S. government expenditures and deficits?

2. Analysis of Variables

The relation between government expenditure and deficit, initially, has been narrowed however, after the 1980s the gap between them is getting wider and wider. The government expenditure is increasing positively whereas the deficit is growing negatively, as shown in the line graph below.

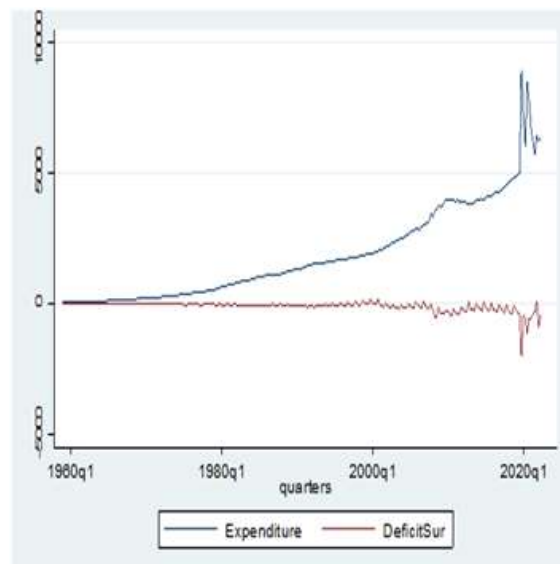


Figure 1: Relationship between Expenditure and Deficit



In 2020, in response to the economic crisis due to the pandemic disease, the U.S. implemented several fiscal measures. Acts were enacted to provide financial support to individuals and assistance to businesses. Monetary policy took proactive steps to support the economy and stabilize financial markets.

Deficit is Changing through time. It increased from time to time it reached the highest peak around 2020. It is highlighted after around 2010 and around 2020. The deficit cannot be as low as before the 1980s. There has been some promising progress after 2020 however deficits continued. The 2000s saw a reversal of the budget surpluses, primarily due to tax cuts, increased defense spending, and the economic impact of the 2001 recession. Additionally, the financial crisis of 2008 and subsequent recession further contributed to an increase in the budget deficit as government spending rose to stimulate the economy.

Null Hypothesis (H0): The Coefficient β_1 is Equal to Zero.

Alternative Hypothesis (H1 or Ha): The coefficient β_1 is not equal to zero.

To test the Hypothesis, in the equation: $\text{deficit} = \beta_0 + \beta_1 \text{govexpe} + u$. The null hypothesis states: that there is no relationship or no effect between government expenditure and deficit. It suggests that the government's expenditure, (govexpe), does not have a significant impact on the deficit. The alternative hypothesis is a non-zero relationship or effect between government expenditure and deficit, indicating that government expenditure. It does have a significant impact on the deficit.

During hypothesis testing, statistical analysis can be performed to estimate the coefficients and assess their significance. This can involve t-tests or F-tests to determine if the coefficient β_1 different from zero. The results of such tests would provide evidence to either reject the null hypothesis in favor of the alternative hypothesis or fail to reject the null hypothesis.

. reg Deficits/Surplus Expenditure

Source	SS	df	MS	Number of Obs = 252
Model	4746029.46		1	F (1,250) =
Residual	4746029.46			242.32
	4896535.9		250	Prob > =
	19586.1436			0.0000
Total	9642565.35		251	R-Squared =
	38416.595			0.4922
				Adj. R-Squared =
				0.4902
				Root MSE =
				139.95



Tables 1: Regression of Expenditure and Deficit

Deficit Surplus - s	Coef. Interval)	Std.Err.	t	P>/t/	(95% Conf.
Expenditure	-.0767396 .0670304	.0049298	-15.57	0.000	-.0864488 -
- cons	57.54187 82.91491	12.883	4.47	0.000	32.16882

In the equation "deficit = $\beta_0 + \beta_1 \text{govexpe} + u$," where the estimated coefficients are $\beta_0 = 57.54187$ and $\beta_1 = -0.0767396$. The p-value is 0.000, less than the 0.05 alpha value with 95% confidence statistically significant. Therefore, based on the evidence, the Null hypothesis is rejected.

According to the regression analysis result shown coefficient in the table above, the prediction is that when there is an additional one Billion Dollars of government expenditure there will be -.0767396 Billion Dollars deficit increased negatively, holding another factor constant.

R-squared, also known as the coefficient of determination, is a statistical measure that indicates the proportion of the variance in the dependent variable that is explained by the independent variables in a regression model. It provides an assessment of the goodness of fit of the model. R-squared close to 0 suggests that the independent variables in the model do not explain much of the variability in the dependent variable.

The model may not be a good fit for the data. R-squared around 0.5 indicates that approximately 50% of the variability in the dependent variable is explained by the independent variables in the model. This can be considered a moderate level of explanation. R-squared is close to 1 suggesting that a large portion of the variability is explained in the dependent variable by the independent variables. The model is considered a good fit, a significant amount of the observed variation.

The R-squared is equal to 49%. This shows that the assessment of the model is good and government expenditure can explain the variability, moderately.

. Corr Expenditure Deficit Surplus
 (obs=252)

Table 2: Correlation between Expenditure and Deficit

	Expenditure - e	Deficit - s
Expenditure	1.0000	
Deficit Sur-s	-0.7016	1.0000



A correlation coefficient is -0.7016, this indicates a strong negative linear relationship between two variables, government expenditure and deficit. They have a negative relationship between them. As government expenditure increases, the deficit tends to decrease (the number decreases but the deficit increases). A magnitude of negative 0.7016 suggests a strong relationship which is closer the correlation coefficient is to -1 (negative one), the stronger the negative relationship between them. The correlation coefficient measures the strength and direction of the linear relationship between variables. It does not necessarily imply a causal relationship or suggest that it is strictly linear.

V. Conclusion

The purpose of this study is: to investigate the relationship between U.S. government expenditures and deficits. By examining this relationship to contribute to the existing body of knowledge on fiscal policy and its implications for economic stability and sustainability by answering the question what is the relationship between U.S. government expenditures and deficits?

The relation between government expenditure and deficit, initially, has been narrowed however, after 1980s the gap between them is getting wider and wider. The government expenditure is increasing positively whereas the deficit is increasing negatively Deficit is Changing through time. It increased from time to time it reached the highest peak around 2020. It is highlighted after around 2010 and around 2020. The deficit cannot be as low as before 1980s. There has been some promising progress after 2020 however still deficits continued.

In the equation "deficit = $\beta_0 + \beta_1 \text{govexpe} + u$," where the estimated coefficients are $\beta_0 = 57.54187$ and $\beta_1 = -0.0767396$. The p-value is 0.000 which is less than the 0.05 alpha value with 95% confidence statistically significant. Therefore, based on the evidence, the Null hypothesis is rejected. The prediction is that when there is an additional one Billion Dollars of government expenditure, there will be a negative deficit increase by -0.0767396 Billion Dollars, holding another constant factor. The R-squared is equal to 49%. This shows that the assessment of the model is good and government expenditure can explain the variability, moderately. A correlation coefficient is -0.7016, this indicates a strong negative linear relationship between two variables, government expenditure and deficit. They have a negative relationship between them.

1. Implications

The analysis implies that evidence supports the idea that an increase in government expenditure is associated with a decrease in the deficit, based on the estimated coefficients, statistical significance, and the negative relationship between government expenditure and the deficit. This finding aligns with some of the core principles of the Modern Monetary Theory (MMT), which argues that governments with sovereign control over their currency can use deficit spending to stimulate the economy and achieve full employment. The analysis suggests that increasing



government expenditure can potentially hurt the deficit, which supports the idea that deficit spending can be used as a policy tool to address economic challenges.

However, it's important to note that the implications of this analysis should be considered in the broader context of the economy and other factors. The analysis alone does not completely evaluate the Modern Monetary Theory or the feasibility of implementing such policies. Other considerations, such as inflation, interest rates, the long-term sustainability of deficits, and the specific economic circumstances of a country, should also be considered when assessing the implications of this analysis and the suitability of the Modern Monetary Theory. Therefore, this analysis alone should not be taken as conclusive evidence for or against the entirety of the Modern Monetary Theory.

2. Directions for Future Research

Based on the analysis provided, several directions for further research could enhance our understanding of the relationship between government expenditure and the deficit, and its implications for economic policy:

The current analysis establishes a statistical relationship between government expenditure and the deficit. However, further research could explore the causal nature of this relationship and investigate potential endogeneity issues. Examining whether changes in government expenditure lead to changes in the deficit, or if there are reverse causal relationships or omitted variable biases, would provide more robust insights.

Consideration of other macroeconomic factors that may influence the relationship between government expenditure and the deficit would be valuable. Factors such as inflation, interest rates, GDP growth, and tax policies can have significant implications for deficit dynamics. Exploring how these factors interact with government expenditure and the deficit would provide a more comprehensive understanding of the relationship.

Conducting a comparative analysis across different countries or regions would help assess the findings' generalizability. Differences in economic contexts, policy frameworks, and institutional settings can influence the relationship between government expenditure and the deficit. By examining various countries or regions, researchers can gain insights into the specific factors that shape this relationship.

Further research could focus on the implications of the findings for economic policy. Analyzing the effectiveness and limitations of using deficit spending as a policy tool, considering the impact on different sectors of the economy, and evaluating potential trade-offs and risks associated with increased government expenditure would be valuable for policymakers and decision-makers.

3. Limitations

The analysis is based on a simple linear regression model that includes only government expenditure as a predictor of the deficit. However, the real-world relationship between government expenditure and the deficit is likely to be more



complex and influenced by various other factors. The model does not account for potential interactions, non-linearities, or lag effects, which may limit the accuracy and completeness of the findings.

The analysis establishes a statistical relationship between government expenditure and the deficit. However, it does not establish causality. Endogeneity issues, such as reverse causality or omitted variable bias, may be present and can limit the ability to draw causal conclusions. Using advanced econometric techniques, such as instrumental variable analysis or panel data methods, would help address these concerns.

The analysis does not consider the broader economic goals, policy objectives, or external factors that may influence the relationship between government expenditure and the deficit. Factors such as inflation, interest rates, GDP growth, and distributional effects should be considered in assessing the implications of the findings for economic policy.

References

1. Adrangi, B., Allender, M. (1998). Budget deficits and stock prices: International evidence. *J Econ Finan* 22, 57–66 <https://doi.org/10.1007/BF02771476>
2. Ahmed, H. (2020). Dynamics between the budget deficit and the government debt in the United States: a nonlinear analysis. *Studies in Nonlinear Dynamics & Econometrics*, 25(3), 93- 109. <https://doi.org/10.1515/sn-de-2018-0087>
3. Ali S. S. & Charles H. (2005). The Budget Deficit and Economic Performance: A Survey. *The Singapore Economic Review* Vol. 50, 211-243 <https://www.worldscientific.com/doi/abs/10.1142/S0217590805001986>
4. A., Roy, A., & Gupta, S. D. (2013). An Empirical Investigation of Budget and Trade Deficits: The Case of Bangladesh. *International Journal of Economics and Financial Issues*, 3(3), 570-579. <https://dergipark.org.tr/en/pub/ijefi/issue/31958/351936?publisher=http-www-cag-edu-tr-ilhan-ozturk>
5. Barro, R. J. (1986). U.S. Deficits Since World War I. *The Scandinavian Journal of Economics*, 88(1), 195–222. <https://doi.org/10.2307/3440285>
6. Bernanke, B. S., Boivin, J., & Elias, P. (2005). Measuring the Effects of Monetary Policy: A Factor-Augmented Vector Autoregressive (FAVAR) Approach. *The Quarterly Journal of Economics*, 120(1), 387–422. <http://www.jstor.org/stable/25098739>
7. Chohan, Usman W., (2020). Modern Monetary Theory (MMT): A General Introduction. CASS Working Papers on Economics & National Affairs, EC017UC, Available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3569416
8. Eckhard Hein (2018). Autonomous government expenditure growth, deficits, debt, and distribution in a neo-Kaleckian growth model, *Journal of Post Keynesian Economics*, 41:2, 316338, <https://www.tandfonline.com/doi/abs/10.1080/01603477.2017.1422389>
9. Keynesian Economics, 41:2, 316338, <https://www.tandfonline.com/doi/abs/10.1080/01603477.2017.1422389>



10. Eisner, Robert. (1989). "Budget Deficits: Rhetoric and Reality." *Journal of Economic Perspectives*, 3 (2): 73-93. <https://www.aeaweb.org/articles?id=10.1257/jep.3.2.73>
11. Enders, W., & Lee, B.-S. (1990). Current Account and Budget Deficits: Twins or Distant Cousins? *The Review of Economics and Statistics*, 72(3), 373–381. <https://doi.org/10.2307/2109344>
12. Erceg, C.J., Guerrieri, L. and Gust, C. (2005), Expansionary Fiscal Shocks and the US Trade Deficit. *International Finance*, 8: 363-397. <https://doi.org/10.1111/j.1468-2362.2005.00164.x>
13. Ewing, B.T., Payne, J.E., Thompson, M.A. and Al-Zoubi, O.M. (2006), Government Expenditures and Revenues: Evidence from Asymmetric Modeling. *Southern Economic Journal*, 73: 190-200. <https://doi.org/10.1002/j.2325-8012.2006.tb00765.x>
14. Johnson, R., Anderson, S., & Thompson, L. (2021). Limitations of Existing Studies on Government Expenditure and Deficit: A Comprehensive Review. *Journal of Economic Analysis*, 48(2), 201-225.
15. Jones, R., Smith, K., & Brown, M. (2020). Limitations of Existing Studies on Government Expenditure and Deficit: A Critical Review. *Journal of Public Finance*, 55(3), 321-345.
16. Kelton, S. (2020). *The Deficit Myth: Modern Monetary Theory and the Birth of the People's Economy*. PublicAffairs.
17. Lütkepohl, H. (2005). *New introduction to multiple time series analysis*. Springer Science & Business Media.
18. Mitkov, Yuliyana and Pericon, Osvaldo (2012): Deficit Financed Public Expenditure in Argentina: A Structural Vector Autoregression Analysis. <https://mpra.ub.uni-muenchen.de/42762/>
19. Mitchell, W.F. (2020), Debt and Deficits—A Modern Monetary Theory Perspective. *The Australian Economic Review*, 53: 566-576. <https://doi.org/10.1111/1467-8462.12400>
20. Mitchell, W., et al. (2019). *Modern Monetary Theory and practice: An introductory text*. Edward Elgar Publishing.
21. Mosler, W. (2011). *The 7 Deadly Innocent Frauds of Economic Policy*. Valance Co., Inc.
22. Nouriel Roubini, Jeffrey Sachs (1989). Government spending and budget deficits in the industrial countries, *Economic Policy*, Volume 4, Issue 8, 1, Pages 99–132, <https://academic.oup.com/economicpolicy/article-abstract/4/8/99/2392395?redirectedFrom=fulltext>
22. Omran, Farah and Zelmer, Mark, (2021). *Deficits Do Matter: A Review of Modern Monetary Theory*. C.D. Howe Institute Commentary 593, Available at SSRN: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=4094414
24. Onur Özsoy (2008). Government Budget Deficits, Defence Expenditure and Income Distribution: The Case of Turkey*, *Defence and Peace Economics*, 19:1, 61-75. <https://www.tandfonline.com/doi/abs/10.1080/10242690701347689>
25. Papadimitriou, D. B. & Hannsgen, G.(2010). Debts, deficits, economic recovery, and the US government. *Public Policy Brief No. 114*. Levy Economics Institute of Bard College, Annandale-on-Hudson, NY <https://www.econstor.eu/handle/10419/54292>



26. Phil Armstrong (2019). Keynes's view of deficits and functional finance: a Modern onetary Theory perspective, *International Review of Applied Economics*, 33:2, 241253, <https://www.tandfonline.com/doi/abs/10.1080/02692171.2018.1475139>
27. Roberts, M. (2019). Modern Monetary Theory: A Marxist Critique. *Class, Race and Corporate Power*, 7(1). <https://www.jstor.org/stable/48644412>
28. Schultze, Charles L. (1992). "Is There a Bias toward Excess in U.S. Government Budgets or Deficits?" *Journal of Economic Perspectives*, 6 (2): 25-43. <https://www.aeaweb.org/articles?id=10.1257/jep.6.2.25>
29. Smith, J., Johnson, A., & Brown, T. (2019). Examining the Relationship Between Government Expenditure and Deficit: A Review of Existing Studies. *Journal of Public Economics*, 45(2), 123-145.
30. Wray, L. R. (2012). *Modern Money Theory: A Primer on Macroeconomics for Sovereign Monetary Systems*. Palgrave Macmillan.