The Impact of Government Budget Deficits on National Income and Employment

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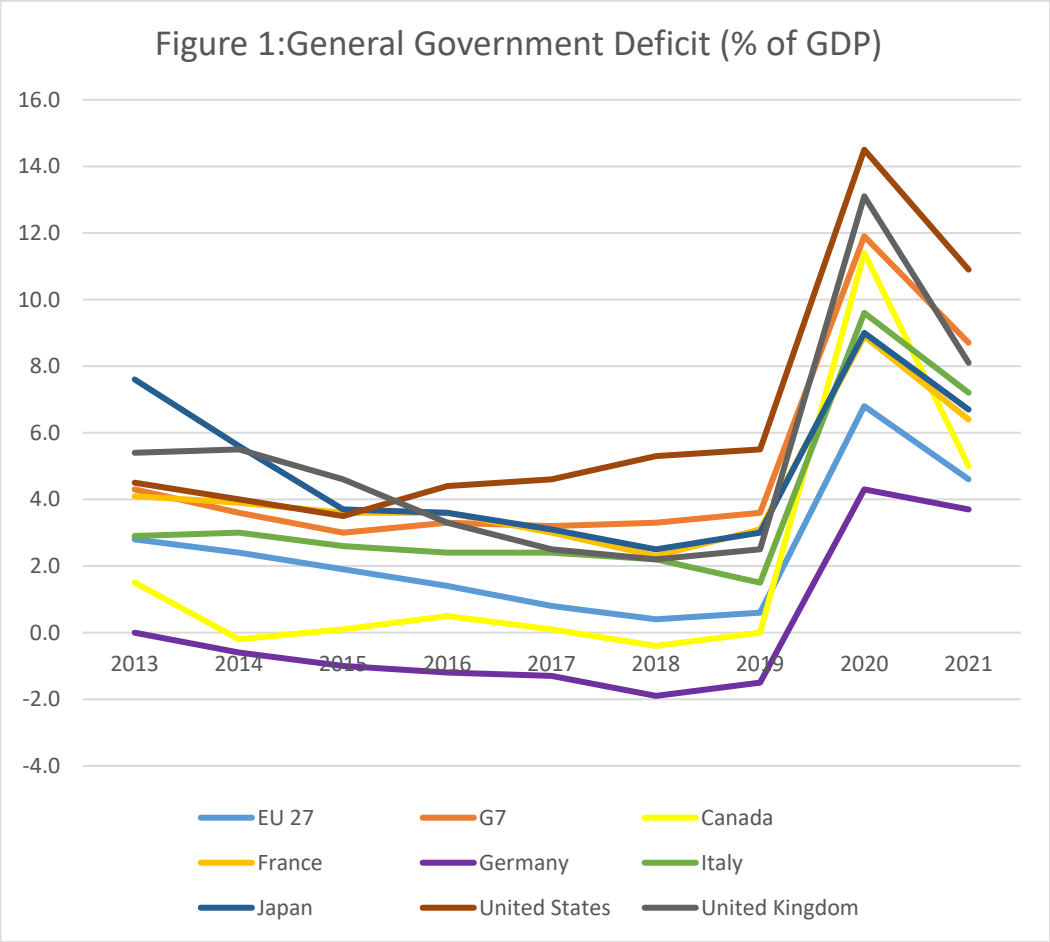
Abstract

This paper investigates the effect of government budget deficits on national income and employment by using data from G7 countries from 2012-2021. It employs fixed effect and ordinary least squares regressions to determine the correlation between government deficits and GDP growth and the correlation between government deficits and unemployment. The analysis reflects that government deficit positively correlates with GDP growth but has no significant correlation with unemployment. The author also finds that other control variables like gross saving, trade growth rate, and log(GDP) have different levels of impact on GDP growth or unemployment. Finally, the result shows that government budget deficits can promote national income growth in G7 countries, but no evidence shows deficits influence employment over the ten years.

Contents

1. INTRODUCTION

In recent years, many countries have widely applied expansionary fiscal policies, especially when resisting the economic recession brought on by Covid-19 since 2020. In this case, government budget deficits have become a common phenomenon and are always a concern of economists. In Figure 1, except for Germany and Canada, government deficits (% of GDP) in the G7 countries always exist during 2013-2021. The average deficit of G7 countries is also higher than that of 27 EU members yearly. Therefore, in this dissertation, the author will focus on the economic effect of government budget deficits in G7 countries and explore its impact on national income and employment over 2012-2021. The author uses GDP growth to represent national income and uses the unemployment rate to represent employment, and applies penal data models to respectively reflect how they are affected by government deficits (% of GDP). In my research, I adopt Fixed Effect (FE) and Ordinary Least Squares (OLS) analysis to regress the dependent variable of government deficits on the independent variable of GDP growth in Model 1, and on the independent variable of unemployment (% of total labor) in Model 2. I control the rest of the variables, including inflation, log(GDP), gross saving, trade, trade growth, and employee compensation. My primary hypothesis is that different levels of government debt can explain the change in GDP growth and unemployment. My second hypothesis suggests that other control variables, such as log(GDP), gross saving, and trade growth, can also explain the variability of GDP growth and unemployment.



*Notes: General Government Deficits in figure 1=(government spending - government revenue)/GDP *100%*

EU 27 - Average of the 27 EU member states

G7(Group of Seven) - Average of the Group of Seven member states

Source: Office for National Statistics and IMF World Economic Outlook October 2022

Spilioti and Vamvoukas's (2015) literature empirically investigates the effect of government debt on the GDP growth in Greece from 1970 to 2010. It concludes that government debt positively impacts GDP growth. Different from this literature, I use government deficits instead of government debt to explore its relationship with GDP growth and get the same conclusion that government deficits can promote GDP growth. I also explore the relationship between government deficits and employment, which is not done by Spilioti and Vamvoukas. Furthermore, I use more recent data

from 2012-2021 and have a more extensive country sample size, including Japan, Canada, Germany, etc.

In this report, the author uses two penal data models to analyze government deficits' impact on GDP growth and unemployment. The correlation between government deficits and GDP growth and the correlation between government debt and unemployment are discussed first by correlation analysis, then by OLS and FE regression analysis. The test results show that government deficit positively correlates with GDP growth at a significant level but has no apparent correlation with unemployment. It means the government budget deficit can promote national income growth but has no significant impact on employment over the decade 2012-2021 in G7 countries. Finally, the robustness of these results is tested by replacing explained variables, which verified the reliability of our research outcomes.

This paper is organized as follows. Section 2 applies theory and empirical reviews to discuss the effects of government budget deficits on national income and employment. Section 3 outlines the sources of data, methodology, and hypotheses used in this empirical paper. Section 4 presents our empirical analysis process and results. In section 5, the author shows some reflection on the limits of this research. Finally, section 6 summarizes the whole paper and gives the conclusion.

2. LITERATURE REVIEW

2.1 Theory Review

2.1.1 Neoclassical Paradigm

The Neoclassical theory focuses on the long-term effect of budget deficits. It assumes that people are far-sighted and that budget deficits can increase their aggregate lifetime consumption by transferring taxes to the next generation. If economic resources are completely utilized, an increase in consumption must mean a decrease in saving (Bernheim, 1989). Lower private savings would make people have less money available for investment. Elmendorf and Mankiw (1999) put forward that decrease in investment (accumulation of assets) means capital stock owned by people falls, and returns to these assets would thus decrease, which leads to a drop in future national income (aggregate output). So according to the neoclassical view, government budget deficits would crowd out private savings and diminish people's investment, reducing national income in the long run. In addition, the decrease in private investment and less capital utilization can also result in fewer private-sector jobs offered and a higher unemployment rate (De Leeuw & Holloway, 1985; Mahadea & Simson, 2010; Salsman, 2017).

2.1.2 Keynesian Paradigm

Unlike Neoclassical opinions, Keynesian focuses on the short-term effect of budget deficits. It envisions that a large number of people are short-sighted and

liquidity-constraint. Once the government budgets increase people's wealth by reducing taxes and other means, these short-sighted people tend to spend their disposable incomes immediately. Aggregate demand is stimulated, and the gross national product will remarkably increase. In this case, investors will be optimistic and confident about the future return on investment and conduct more investment activities. It is just the 'crowding-in' effect, which rejects the neoclassical thought of crowding out private capital. Thus, more private investment would encourage the growth of future national income (Saleh & Harvie, 2003). In addition, Keynesians assume the economy's resources are not fully employed. Once national income increases, the second-round effects and Keynesian multiplier will be created. Due to both consumption and national income growth, national saving and capital accumulation will not diminish and can be even higher than before (Bernheim, 1989).

Keynesian unemployment theory believes that the increase in the unemployment rate is caused by the fact that the number of vacancies in the labor market is lower than the number of job seekers (Kayode et al., 2014). To solve this situation, the government needs to intervene through investment and subsidies to public or private sectors or issuing some expansionary monetary policy (Haris, 2005), to increase aggregate market demand for talents and create jobs for the unemployed population. Therefore, Keynesians support that government deficits can help to reduce the unemployment rate.

2.1.3 Ricardian Paradigm

Ricardian Equivalence Hypothesis (REH) thinks government budget deficits can only postpone tax payments. Rational people fully expect that tax cuts today will lead to tax increases sometime in the future and believe this tax benefit is meaningless. Thus, they will not intend to increase consumption but save the extra disposable income (Marinheiro, 2007). Then, private savings will rise, and people will use these savings to buy bonds issued by the government to prepare for future tax increases (Saeed & Khan, 2012). In this case, government deficits (whether long-term or short-term) will not affect aggregate output and interest rate if the rise in private savings offsets the fall in national savings (the amount of deficits increases) (Barro, 1974). Furthermore, employment is unaffected due to no change in aggregate demand and output (Emeka, 2018). However, Barro (1974) proposes that realizing REH requires some prerequisites that are difficult to achieve. For example, households need to be rational, far-sighted, altruistic, and have no liquidity constraints, etc.

2.2 Empirical Review

2.2.1 The impact of government deficits on national income

Castro and Cos (2008) does an empirical investigation to analyze the economic impact of expansionary fiscal policy in Spain over the period 1980-2004. They use VAR methodology to test the impact of different public expenditure components on economic activities and find the phenomenon that regardless of the implementation of

public investment, public consumption, or tax cuts, the short-term response of GDP is positive and significant, but this response quickly fades away in the medium or long run due to their adverse effects on economic activities. They finally conclude that there is a positive relationship between government expenditure and output in the short-term, while medium and long-term budget deficits only lead to higher inflation and lower output.

Hassan et al. (2014) investigate the relationship between government deficit spending and GDP in the US over the long-term period 1930-2010. Using transfer function analysis, they find that the coefficient between deficit spending and GDP is -0.37 with $p< 0.0001$, which means government deficits have a negative impact on national income during the long-term period. Furthermore, the Cross Correlation and the Granger test consistently show a negative correlation between government deficits and GDP.

Loizides and Vamvoukas (2005) examine the impact of government size (measured as the share of government expenditure in GNP) on economic growth in the UK, Ireland, and Greece from 1960 to 1995 using time series data. Through applying bivariate and trivariate system analysis, they discover that public expenditure cause the growth of national income in all three countries either in the short term or long term, which rejects their hypothesis that public expansion can hamper the economic growth in

these countries. This conclusion is quite different from the results of Castro and Cos (2008) and Hassan et al. (2014).

2.2.2 The impact of government deficits on employment

Mahmood et al. (2014) discuss the factors influencing unemployment in Pakistan from 1990 to 2010. By employing variance inflation factor analysis and Stepwise regression with the forward selection technique, they find that the standardized coefficient between budget deficit and unemployment is 0.484 at a significant level. This positive correlation shows that a budget deficit can significantly enhance unemployment.

However, the results of Egbulonu and Amadi (2016)'s research reveal the opposite opinion. They test the long-term relationship between budget deficits and unemployment in Nigeria during 1970-2013. Through the parsimonious error correction model (ECM), they discovered that a 1% growth in government spending would significantly reduce unemployment by 0.068%. Then, the result of the Pairwise Granger Causality Test also presents that there is a negative relationship between government budget deficits and unemployment, and an increase in the tax rate would reduce employment in Nigeria.

Laokulrach (2013) investigates the impact of fiscal policy on service sector employment in Thailand from 1986 to 2011. The research uses multiple regression

analysis and finds no significant correlation between fiscal policy (budget deficits) and unemployment. In contrast, some supply-side policies and socioeconomic factors seem to impact unemployment more.

2.3 Summary

Overall, the Neoclassical, Ricardian, and Keynesian Paradigms provide different ideas on the impact of government budget deficits on national income and employment. Some empirical studies are also provided to illustrate the effect of government deficits in different situations. In this dissertation, I will discuss this topic based on G7 countries from 2012-2021. My paper is similar to Spilioti and Vamvoukas's (2015) literature. They did an empirical investigation to explore the relationship between government debt and economic growth over 40 years, starting from 1970 in Greece. They use time series data and conclude that government debt can promote GDP growth through regression analysis. The author uses similar empirical models while applying different data analyses (penal data analysis) and different dependent variable (government deficits) and control variables (log(GDP), employee compensation, inflation). In addition, the author also investigates the impact of government deficits on employment, which is not done by Spilioti and Vamvoukas (2015)'s literature.

3. DATA, METHODOLOGY AND HYPOTHESES

3.1 Data Sources

The data used in this paper mainly comes from Organization for Economic Cooperation and Development (OECD) database, World Bank national accounts data, and International Monetary Fund (IMF). It covers the decade from 2012 to 2021 for G7 members, including the United Kingdom (UK), United States (USA), France, Germany, Italy, Japan, and Canada. Information in 2022 was dropped from the original sample due to data constraints. It is obvious that the paper uses panel data analysis, and each variable has 70 observations. Penal data is a combination of time series and cross-section data. Its usage increases the degrees of freedom, provides more sample options, and therefore improves the efficiency of econometric estimates (e.g., Hsiao et al. 1995). Furthermore, in some instances, penal data can simplify computation and statistical inference and solve many problems that can not be addressed by time series or cross-section data sets alone (Hsiao, 2007).

3.2 Methodology

In order to measure the impact of government budget deficits respectively on national income and employment, the author will apply two empirical models. Model 1 tests the effect of budget deficits on national income, and Model 2 tests the effect of budget deficits on employment.

Model 1:

$$GRGDP_{it} = \beta_1 DEFICITS_{it} + \beta_2 SAVINGS_{it} + \beta_3 log(GDP_{it}) + \beta_4 INFLATION_{it} + \beta_5 TRADE_{it} + \beta_6 GRTRADE_{it} + \varepsilon_{it} \quad (1)$$

In Model 1, i is country and t is the year. For example, $GRGDP_{it}$ means the growth rate of the gross domestic product of a particular country in a specific year. As an explained (dependent) variable, it represents the change of national income. $DEFICITS_{it}$ is the general government deficit as the percentage of GDP and is the core explanatory variable. Here, general government deficit is defined as the balance of government income and expenditure, so if $DEFICITS_{it}$ is negative, government deficit exists. If $DEFICITS_{it}$ is positive, there is a governmnet surplus. $SAVINGS_{it}$ is gross savings as percent of GDP. $Log(GDP_{it})$ denotes the logarithm of the initial gross domestic product per capita level. $INFLATION_{it}$ means annual inflation measured by the consumer price index. $TRADE_{it}$ is the sum of exported and imported goods and services measured as a share of GDP, and $GRTRADE_{it}$ is the growth rate of trade. $\mathcal{E}_{it}$ denotes the unobserved remainder. $SAVINGS_{it}$, $log(GDP_{it})$, $INFLATION_{it}$, $TRADE_{it}$ and $GRTRADE_{it}$ are all control variables.

Model 2:

$$UNEMPLOYMENT_{it} = \beta_1 DEFICITS_{it} + \beta_2 SAVINGS_{it} + \beta_3 INFLATION_{it} + \beta_4 log(GDP_{it}) + \beta_5 TRADE_{it} + \beta_6 COMPENSATION_{it} + \varepsilon_{it} \quad (2)$$

In Model 2, $UNEMPLOYMENT_{it}$ is explained variable, which represents unemployed population as the percentage of the total labor force. $DEFICITS_{it}$ is a still core explanatory variable; other variables are control variables. $COMPENSATION_{it}$ is one of the control variables and represents the compensation of employees, which includes two components: gross salaries and wages payable in cash and value of social contribution payable by employers. This indicator is measured as a percentage of gross value added.

Our empirical models are similar to Spilioti and Vamvoukas (2015). However, their model uses time series analysis and only has time t in the model. In contrast, the author uses panel data analysis and chooses samples in different country i at different time t. Moreover, we also test the effect of government deficits on unemployment in Model 2, which is not tested in their model. Finally, we have different dependent variable (DEFICITS) and control variables like log(GDP), INFLATION, and COMPENSATION.

3.3 Hypotheses

The primary hypothesis we aim to examine is whether the variability of both GDP growth and unemployment is explained by the variability of the different levels of government deficits. The secondary hypothesis we have to test is whether the variability of GDP growth and unemployment is explained by the variability of other control variables such as log(GDP), gross saving, inflation, trade, trade growth, and

employee compensation. If any of these hypotheses is true, the implication would be that the growth rate of GDP and unemployment are affected by some of the above independent variables. If the alternative hypotheses are true, we infer that the changes in the above explanatory variables do not explain the changes in the GDP or unemployment.

4. EMPIRICAL ANALYSIS AND RESULTS

4.1 Descriptive Statistics

Table 1. Descriptive statistics of all variables

VARIABLES	Observations	mean	sd	min	max
GRGDP	70	1.043	3.089	-11.03	7.525
UNEMPLOYMENT	70	6.528	2.873	2.350	12.82
DEFICITS	70	-4.036	3.560	-14.86	1.950
SAVINGS	70	21.75	4.978	11.70	30.65
Log(GDP)	70	10.68	0.180	10.32	11.16
INFLATION	70	1.307	0.974	-0.233	4.698
TRADE	70	55.85	18.37	23.38	88.74
GRTRADE	70	0.313	5.81	-11.6	19.2
COMPENSATION	70	53.65	4.606	43.64	59.87

Table 1 shows that the mean of GRGDP is 1.043%, which has lagged behind the world average GDP growth rate (2.65%) in the past decade. However, due to the large GDP base of these developed countries, their average log(GDP) ($10.68) is far above the world average ($4.037). The mean of DEFICITS is -4.036% of GDP, and the minimum one is -14.86%, which is relatively high and even dangerous. It may be because these G7 countries need to find money to meet the growing demand for better

public services and social security systems due to population aging. They must also fund defense and the military in this increasingly unstable global security environment (ICAEW Insights, 2021). In addition, since 2020, the COVID-19 pandemic has caused a severe economic depression that has led to a significant rise in the government budget deficit. It has also resulted in a considerable increase in the government's annual debt. As for SAVINGS, its mean is 21.75% of GDP, which is lower than the world average (26.532%). The UK has the lowest gross saving among these countries, with annual figures being less than 16%. In the short term, low national savings may improve people's quality of life, but in the long run, it will give the country fewer funds to invest, which will affect future economic development (EconomicsOnline, 2021). The mean values of INFLATION (1.307%) and TRADE (55.85%) are maintained at a normal level. The average COMPENSATION (53.65%) of G7 is relatively higher than in other countries worldwide. Satisfactory employee compensation is conducive to reducing the unemployment rate. The average UNEMPLOYMENT is 6.528%, while the maximum unemployment rate is nearly double. This presents that the employment situation in the seven countries still has a lot of uncertainty and unrest.

4.2 Correlation Analysis

Table 2.1 Variance inflation factor (VIF) test for Model 1

Variable	VIF	1/VIF
INFLATION	1.880	0.532
TRADE	1.800	0.554
DEFICITS	1.790	0.560

Log(GDP)	1.610	0.621
GRTRADE	1.370	0.731
SAVINGS	1.300	0.770
Mean	VIF	1.620

Table 2.2 Variance inflation factor (VIF) test for Model 2

Variable	VIF	1/VIF
Log(GDP)	2.920	0.342
TRADE	2.760	0.362
COMPENSATION	2.470	0.406
DEFICITS	1.900	0.526
INFLATION	1.560	0.641
SAVINGS	1.240	0.805
Mean	VIF	2.140

Table 3.1 Correlation analysis of Model 1

	GRGDP	DEFICITS	SAVINGS	Log(GDP)	INFLATION	TRADE	GRTRADE
GRGDP	1						
DEFICITS	0.313***	1					
SAVINGS	-0.00600	0.314***	1				
Log(GDP)	0.303**	-0.204*	-0.0840	1			
INFLATION	0.385***	-0.0420	-0.268**	0.459***	1		
TRADE	0.00500	0.605***	0.168	-0.261**	0.0750	1	
GRTRADE	0.540***	0.220*	0.165	-0.101	0.294**	0.0810	1

Table 3.2 Correlation analysis of Model 2

	UNEMPLOYMENT	DEFICITS	SAVINGS	INFLATION	TRADE	COMPENSATION	log(GDP)
UNEMPLOYMENT	1						
DEFICITS	-0.0690	1					
SAVINGS	-0.381***	0.314***	1				
INFLATION	-0.102	-0.0420	-0.268**	1			
TRADE	0.101	0.605***	0.168	0.0750	1		
COMPENSATION	-0.369***	-0.00500	0.110	0.200*	0.279**	1	
Log(GDP)	-0.423***	-0.204*	-0.0840	0.459***	-0.261**	0.567***	1

∗∗∗, ∗∗ and ∗ denote statistical significance at the 1, 5 and 10 percent levels, respectively.

The data presented in Tables 2.1 and 2.2 show that the VIF means for Model 1 and Model 2 are 1.620 and 2.140, respectively, both below the threshold of 5. Additionally, every variable's VIF is less than 5, indicating no multicollinearity issue in either model. Table 3.1 and table 3.2 shows that the coefficient between DEFICITS and GRGDP is 0.313, and the coefficient between DEFICITS and UNEMPLOYMENT is -0.069, which means that government deficit has a positive impact on the growth of GDP and helps to reduce unemployment. However, table 3.2 illustrates no significant correlation between DEFICITS and UNEMPLOYMENT. Then, Regression analysis will be done in the next part to examine their relationships further.

4.2 Regression Analysis

In this part, the author will use ordinary least squares (OLS) and fixed effect (FE) models to do regression analysis. However, ordinary least squares regression assumes that all residuals are drawn from a population that has a constant variance (homoscedasticity) (Frost, 2022), so we need firstly use the Breusch-Pagan test to check whether there is heteroskedasticity in Model 1 and Model 2, which would violate the assumption of OLS. In Table 4, the P value in Model 1 is less than 0.05, so the null hypothesis of homoskedasticity is rejected, and there is heteroskedasticity in

Model 1. In contrast, the P value in Model 2 exceeds 0.05, the null hypothesis is accepted, and there is no heteroskedasticity in Model 2.

Table 4 Breusch-Pagan Test Statistics (H_0: Constant variance)

Model 1:	Variable: Fitted values of GRGDP	chi2(1) = 12.53	Prob > chi2 = 0.0004
Model 2:	Variable: Fitted values of UNEMPLOYMENT	chi2(1) = 3.55	Prob > chi2 = 0.0597

Table 5.1 Regression analysis for Model 1

	OLS Regression GRGDP	FE Regression GRGDP
DEFICITS	0.382**	0.488***
	(0.150)	(0.131)
SAVINGS	-0.090*	0.394
	(0.053)	(0.204)
Log(GDP)	5.957***	8.119*
	(2.059)	(3.844)
INFLATION	0.236	0.272
	(0.432)	(0.430)
TRADE	-0.032	-0.182
	(0.023)	(0.187)
GRTRADE	0.263***	0.275**
	(0.069)	(0.110)
_cons	-57.680***	-82.582*
	(21.592)	(39.833)
observations	70	70
r2	0.539	0.588
r2_a	0.495	0.549
F test	0.000	0.000

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 5.1 Regression analysis for Model 2

	OLS Regression UNEMPLOYMENT	FE Regression UNEMPLOYMENT
DEFICITS	-0.140	-0.190
	(0.113)	(0.133)

SAVINGS	-0.222***	-0.398**
	(0.071)	(0.158)
INFLATION	-0.219	-0.220
	(0.349)	(0.164)
TRADE	0.045*	0.070
	(0.023)	(0.083)
COMPENSATION	-0.162	-0.366
	(0.114)	(0.251)
Log(GDP)	-3.753	-0.377
	(2.911)	(1.478)
_cons	57.347**	34.452
	(27.161)	(20.781)
Observations	70	70
r2	0.390	0.425
r2_a	0.332	0.370
F test	0.000	0.000

Robust t-statistics in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The estimation results of Equations (1) and (2) are presented in Tables 5.1 and 5.2. In Table 5.1, both OLS and FE regressions reflect a significant positive correlation between GRGDP and DEFICITS, demonstrating that government budget deficits can promote national income growth in G7 countries. This aligns with Keynesian theory, which thinks government deficits can stimulate aggregate demand and remarkably improve GDP. This result is also supported by pieces of literature of Spilioti and Vamvoukas (2015)'s and Loizides and Vamvoukas's (2005).

In Table 5.2, although the coefficients between UNEMPLOYMENT and DEFICITS are negative in both regressions, their correlation is not significant, meaning government deficits do not have an obvious impact on employment. This result is consistent with that of correlation analysis. The cause may be that the sample period

is short (only ten years), and the effect of government spending on employment has not yet been evident. Another possibility is that budget deficits do not influence employment at all, and there are also some papers supporting the conclusion. For instance, Laokulrach (2013) did relevant research covering more than 20 years in Thailand and found that fiscal policy tool (budget deficits) does not have any significant impact on service sector employment. So far, the central question of our analysis of whether national income and employment are affected by the different levels of government budget deficits is upheld by the data.

The two tables also present that some control variables significantly affect GRGDP or UNEMPLOYMENT. For example, log(GDP) and GRTRADE are important determinants of GRGDP in Model 1 and have a positive impact on it. UNEMPLOYMENT is negatively affected by SAVINGS in Model 2. So the second question of our analysis of whether national income and employment are affected by the inclusion in equation estimation of some other control variables is also upheld by the data. The results of the F test for the two models are close to zero. It means the null hypothesis that all the regression coefficients are equal to zero is rejected, and both regressions are overall meaningful.

4.4 Robustness Check ----- Replacing Explained Variables

The author will test the robustness of our regression results by replacing explained variables for both models. For Model 1, the dependent variable GRGDP will be

replaced by GRGNI, which is the gross national income growth rate. This can test whether government budget deficits really have an impact on national income. For Model 2, the dependent variable UNEMPLOYMENT will be replaced by EMPLOYMENT, which denotes employed people as the share of the total working-age population. This can test whether government budget deficits really have an impact on employment. Table 6.1 presents that both GRGDP and GRGNI positively correlate with DEFICITS at a significant level. It verified that government budget deficits could encourage the growth of national income. Table 6.2 shows that DEFICITS have no significant correlation with neither UNEMPLOYMENT nor EMPLOYMENT, which confirms that government budget deficits do not influence employment in G7 countries.

Table 6.1 Robustness test for Model 1

	(1) GRGDP	(2) GRGNI
DEFICITS	0.382**	0.374*
	(2.55)	(2.23)
SAVINGS	-0.090	-0.075
	(-1.70)	(-1.27)
Log(GDP)	5.957**	6.206**
	(2.89)	(2.91)
INFLATION	0.236	0.064
	(0.55)	(0.13)
TRADE	-0.032	-0.034
	(-1.39)	(-1.29)
GRTRADE	0.263***	0.341***

	(3.80)	(3.97)
_cons	-57.680**	-60.306**
	(-2.67)	(-2.70)
Observations	70	69
r2_a	0.495	0.487

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

Table 6.2 Robustness test for Model 2

	(1) UNEMPLOYMENT	(2) EMPLOYMENT
DEFICITS	-0.140	0.352
	(-1.24)	(1.51)
SAVINGS	-0.222**	0.224
	(-3.13)	(1.50)
INFLATION	-0.219	0.341
	(-0.63)	(0.45)
TRADE	0.045	-0.067
	(1.93)	(-1.27)
COMPENSATION	-0.162	0.689**
	(-1.42)	(2.90)
Log(GDP)	-3.753	4.843
	(-1.29)	(0.80)
_cons	57.347*	-19.228
	(2.11)	(-0.34)
Observations	70	70
r2_a	0.332	0.345

t statistics in parentheses

* p<0.05, ** p<0.01, *** p<0.001

5. LIMITATIONS OF THE STUDY

There is no doubt that this paper has some limitations. The first one is that the observations of every variable are only 70, and the sample size is relatively small. This may reduce the study's statistical power and increase the margin of error (Deziel, 2019). The second shortcoming is that the countries selected by the author for research are all developed countries, so the conclusions drawn in this article may not conform to the overall level of the world. In addition, the robustness tests done by the author are inadequate. The author can also do more robust checks like examining endogenous problems, adding instrumental variables, doing heterogeneity analysis, etc. Finally, some control variables that might have a great impact on dependent variables are ignored by authors. For example, variables like wages and education may be important determinants of employment but were not mentioned by the author in the empirical model.

6. CONCLUSION

This paper aims to investigate the impact of government budget deficits on national income and employment in G7 members from 2012 to 2021. The author uses two penal data models to respectively explore the relationship between government deficits and GDP growth and the relationship between government deficits and unemployment. Both correlation analysis and regression analysis (including OLS regression and FE regression) reflect the same truth that government deficit is positively correlated with the growth rate of GDP while having no significant

correlation with unemployment over the decade. Then, the robustness of the results is checked by changing explained variables. The author replaces the growth rate of GDP with the growth rate of GNI and replaces the unemployment rate with the employment rate, and gets the same results as the original findings. The research also shows that control variables, including log(GDP) and trade growth, can significantly affect GDP growth in Model 1, and gross saving significantly affects the unemployment rate in Model 2.

However, there are some limits to this research. The sample size in the study is relatively small, which may decrease statistical power and lead to some errors. In addition, the robust test done by the author is inadequate, and the author also ignores some critical control variables like wages, education, etc. Therefore, in my future projects, I will extend my sample size, use more reliable and representative dependent and independent variables, and also do more comprehensive robust tests.

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