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FISCAL POLICY AND ECONOMIC GROWTH: EVIDENCE FROM EUROPEAN UNION COUNTRIES[3]

This article empirically examines the fiscal policy elements affecting economic growth in 27 European countries and Switzerland (Without the United Kingdom). The research objective is to estimate the impact of macroeconomic variables such as tax revenue, government expenditure and public debt on the economic development of 28 European countries. The study employs a panel ordinary least squares (POLS) technique with a fixed effect estimation method. The Hausman test was applied to support the validity of the fixed effect over the random effect estimation model. Annual secondary data for the period 1995-2020 were used, including 728 observations. Based on the results, it may be inferred that the increase in government expenditure and tax revenue leads to an increase in economic growth in 28 EU countries. However, the higher rates of public debt lead to a decrease in economic growth. From the standpoint of fiscal policy, we conclude that Keynesian theory in the 28 EU countries was present. The study has empirically established the importance of fiscal policy tools in European countries. The study calls for the establishment of moderate fiscal policy strategies that would help ensure solvency and stimulate economic growth.
Keywords: fiscal policy; budget deficit; economic growth; Keynesian theory
JEL: E62; H62; E12; E13

1. Introduction

The fiscal policy shows the actions of the government for the regulation of the economy and the achievement of certain macroeconomic goals and economic prospects (Georgieva, 2021). The objective of fiscal policy tools is the stimulation of economic growth by pursuing a policy guideline that ensures a sense of balance between taxation, spending and borrowing that is consistent with economic growth goals (Blanchard et al., 2010). Employing fiscal policy, the government influences the aggregate demand and supply of goods and services in the economy. Fiscal policy through tax revenues (direct and indirect taxes) and government

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expenditures affects short-term and long-term physical capital development and thus resilient growth. According to Blanchard et al. (2010), economic growth, price stability, the balance of payments equilibrium, and exchange rate stability are the most important macroeconomic targets that governments focus on when pursuing a fiscal policy to stimulate growth. Therefore, fiscal policy influences the aggregate demand for goods and services, employment, and inflation. In other words, fiscal policy has an impact on the business cycle and long-term economic growth potential of a country. In addition to tax collection and spending, governments use budget deficits and surpluses to impact the business cycle and long-term growth.

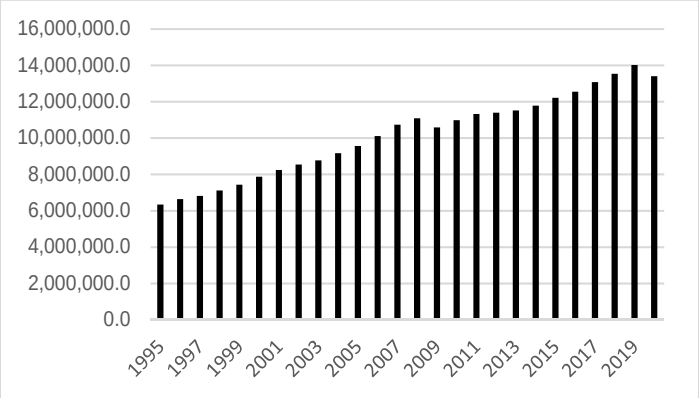
The government can adopt an expansionary or contractionary fiscal policy to influence economic activities. Expansionary fiscal policy has a stimulating effect on the economy, and restrictive fiscal policy has a restrictive effect on the economy. Under the expansionary fiscal policy, the government lowers tax rates and increases government expenditure by increasing the budget deficit. Under the restrictive fiscal policy, the government increases tax rates and lowers government expenditure, and increases the budget surplus. The government pursues expansionary fiscal policies when the economy is in recession. When the economy is at its peak, the government pursues restrictive fiscal policy. When the government deliberately changes the levels of tax rates and government expenditure, this policy is called discretionary fiscal policy, whether restrictive or expansionary fiscal policy. When these changes are made automatically without government intervention, this policy is defined as an automatic stabiliser of fiscal policy.

1.1 Fiscal Policy in European Union Countries

Fiscal policies have a significant effect on an individual country's economic growth, macroeconomic stability and inflation. Key aspects in this respect are the level and composition of government spending, revenue collection, budget deficits and public debt. Fiscal policy is a tool governments employ to influence the business cycle and economic growth. Nominal values of GDP for the period 1995-2020 in the EU show an increase from 6.3 trillion euros in current prices to 13.4 trillion euros or a 111% increase. The highest nominal value of GDP in 2019 was 14.07 trillion euros before the Covid-19 pandemic, an increase of 121%. During the crises (2009 and 2020), the nominal value of the GDP of the EU 28(EU 27 + Switzerland) decreased. In 2009, the nominal value of GDP decreased by 4.5%, and in 2020 the decrease is 4.3% compared to 2019, as shown in Figure 1. Figure 1 shows the trend of GDP growth in the EU.

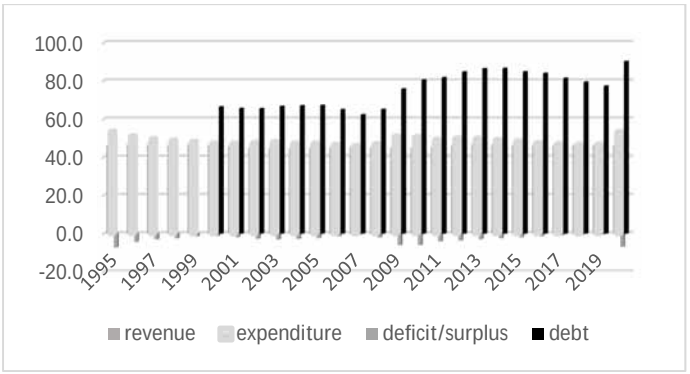
Figure 2 shows the trend of public revenues, government expenditures, budget balance (deficit/surplus), and government debt as a part of the GDP of the countries of EU 28 for the period 1995-2020.

Figure 1. GDP at market prices of EU 28 from 1995 to 2020 (trillion euros)



Source: Prepared by the authors (Data: Eurostat, https://www.mnje.com/index).

Figure 2. Budget revenue, expenditure and budgetary balance and debt trend in the EU



Source: Prepared by the authors (Data: Eurostat, https://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=gov_10a_main&lang=en).

As can be seen (see Figure 2) for the period 1995-2020 in the countries of EU 28, government revenues ranged from 44.4% to 46.6% as a share of GDP. The expenditures ranged from 45.6% to 53.1%. The average value of revenues was 45.6% and that of expenditures was 48.4%. This means, although with many limitations, that government periodically rely on budget deficits to stimulate economic growth (Kurantin, 2017). For the period under investigation, the highest deficit expenditures were registered during the crises in 1995, 2009 and 2020, with values of -7.2%, -6.0% and -6.9%. The average deficit was -2.8%. On the one hand, these deficits aim to stimulate economic growth, as observed empirically. Gllogjani et al. (2021) empirically proved for six Central and Eastern European countries(CEE) that the budget deficit stimulates economic growth. Similar findings are confirmed by Nayab (2015), Molocwa et al. (2018), and Zaheer and Jahan (2021) studies. On the other hand, the use of government deficits in the long-run lead to an increase in government debt and lower economic growth. As confirmed by Kurantin's (2017) study, the continued budget deficit

decreases economic growth in Ghana. Empirical literature records the critical role of government expenditure in providing necessary infrastructure and human capital but high tax revenue will lead to a crowding out effect and may lead to loss of political support by the population.

The government debt as a share of GDP in 28 EU countries was the lowest in 2007 at 62.2% and the highest in 2020 at 90.1%. The average debt value was 75.3%. According to László (2022), the government debt in the euro area countries had fallen from 87.7% to 84% by the end of 2019 but still was too high. A study by Misztal (2021) for the EU countries empirically confirmed that high debt reduces economic growth. The same conclusions are confirmed by Mhlaba and Phiri's (2019) study. They empirically investigate the influence of government debt on economic growth in South African countries for the period 2002-2016. Confirmed that the gross public debt may be beneficial towards short-run economic growth, but the long-term effects remain negative. Mariet (2014) published results for the period 2008-2012 in EU countries. She confirmed that a high level of government debt decreases economic activity. Empirical studies in European countries have been contracting each other.

Like many other advanced countries, European economies have faced a significant accumulation of public debt in the past three decades. The public debt-to-GDP ratio of these nations has increased from an average level of less than 60 per cent of GDP in the early 1990s to more than 90 per cent of GDP in 2015 and worsened by the global financial crisis. It turns out that the governments of the EU 28 countries mainly pursue fiscal deficit policy to overcome the debt effect, which is related to Keynes's theoretical views. The size of the deficit is small when economies are stable and register economic growth. When the economies of the EU 28 countries are in recession, governments significantly increase budget deficits and public debt to stimulate growth. However, deficits created by governments in the period of economic growth harm the long-term development of the economy and contradict Keynes's conclusions. The trends in the figures above reveal a widening gap between expenditure and revenue and increasing debt in the European Union, therefore, a concern that this study is interested in. In addition, at the moment, most empirical studies carried out in European countries on the subject have been inconclusive and mixed. Therefore the study intends to fill this void by investigating the role of fiscal policy tools in explaining economic growth in European counties by applying the *ordinary least squares* (OLS) technique and panel data methodology.

1.2 The objectives of the study

Therefore the paper attempts to:

- To estimate empirically the effect of the tax revenue on economic growth in EU 28 countries.
- To estimate empirically the effect of the government expenditure on economic growth in EU 28 countries.
- To estimate empirically the effect of the public debt on economic growth in EU 28 countries.

2. Theoretical Review

Contemporary fiscal policy is based on Keynes's theory. Keynes (1936) proves that changes made by the government in the levels of taxation and government expenditure have a direct impact on aggregate demand and levels of economic activity. According to him, governments can stabilise the economy by deliberately increasing or decreasing tax rates and government expenditures to regulate the business cycle. This means that during a recession, the government must pursue an expansionary fiscal policy and, in times of high inflation, a restrictive fiscal policy. Under the expansionary fiscal policy, the government reduces tax rates and increases government expenditure (increases the budget deficit). Therefore, the government deliberately makes discretionary changes in fiscal policy. Usually, the increase in government expenditure is accompanied by an increase in the budget deficit. There is a subsequent increase in government debt as a result of this action. Restrictive fiscal policy has the opposite effect. If inflation in the economy increases, the government must increase tax rates and reduce government expenditure. This limits the infrastructure investment by the government and slows private productivity. In expansionary policy, the government increases the money available to business agents and households, while in restrictive policy, it reduces the money. In other words, Keynesian theory encourages governments to exploit budget deficits when the business cycle is in recession. When the business cycle is at its peak, governments have to increase the budget surplus.

From a macroeconomic point of view, economic growth can be represented by the equation:

$$Y = C + I + G + NX \quad (1)$$

Where:

Y – national income (GDP);

C – consumption;

I – investment;

G – government expenditure

NX – net export.

Government fiscal policy in Equation 1 can be included through consumption, such as C (Y-T). Thus, government intervention through fiscal policy (Equation 2) directly affects national income (Y).

$$Y = C(Y - T) + I + G + NX \quad (2)$$

Therefore, C (Y-T) shows that consumption costs depend on taxpayers' incomes and the amount of taxes collected. Ceteris paribus, a reduction in taxes (T) increases aggregate consumption (C), which leads to an increase in national income (Y) on the one hand. On the other hand, an increase in government expenditure (G) also leads to an increase in national income (Y). These two policies show the expansionary policy of the government. Therefore, the government's expansionary fiscal policy increases national income.

When the government increases the amount of taxes, the disposable income of taxpayers decreases (Equation 2). In other words, an increase in taxes (T) leads to a decrease in national income (Y) due to lower consumption (C). When the government reduces government expenditure (G), the effect on consumption is the same as a tax increase (T). Therefore, a reduction in government expenditure (G) leads to a reduction in national income (Y). These two policies show the government's restrictive fiscal policy. Restrictive fiscal policy hurts national income.

These effects of fiscal policy on the economy show that expansionary fiscal policy increases national income and restrictive fiscal policy lowers it. Expansionary fiscal policy has a stimulating effect on the economy, and restrictive fiscal policy has a restrictive effect on the economy. Under the expansionary fiscal policy, the government lowers tax rates and increases government expenditure by increasing the budget deficit. Under the restrictive fiscal policy, the government increases tax rates and lowers government expenditure, and increases the budget surplus. The government pursues expansionary fiscal policies when the economy is in recession. When the economy is at its peak, the government pursues restrictive fiscal policy. When the government deliberately changes the levels of tax rates and government expenditure, this policy is called discretionary fiscal policy, whether restrictive or expansionary fiscal policy. When these changes are made automatically without government intervention, this policy is defined as an automatic stabiliser of fiscal policy.

The opposite view of Keynesian theory is neoclassical economics. The views of neoclassical economics require governments to pursue a budget-neutral policy. A neutral fiscal policy is associated with tax decreases and government expenditure limitations. A basic rule is that the budget is balanced and does not allow the use of a deficit. According to them, low tax rates and limited government expenditure increase the activity of the private sector, which leads to increased economic growth. According to neoclassical theory, three main factors affect economic growth.

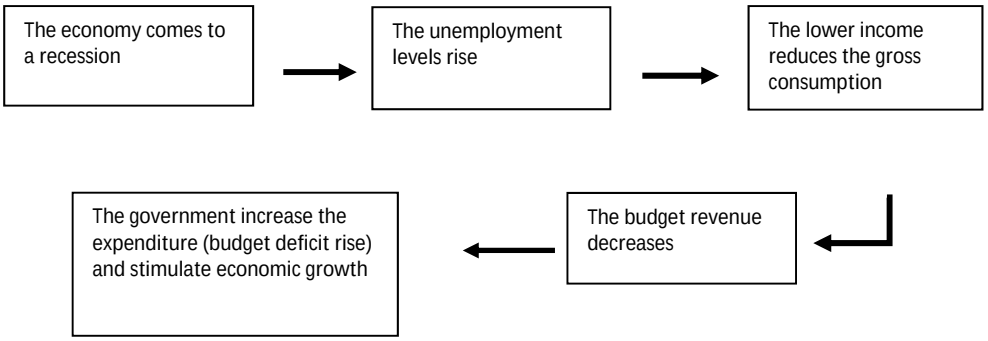
1. Labour supply, which is determined by wages and salaries after taxes are removed;
2. Saving, which is determined by the after-tax rate of return to saving;
3. Business investment is determined by the after-tax rate of return to capital investment.

As can be seen, the two theories have opposing views on the use of fiscal policy. Keynesian theory recommends that governments actively use fiscal policy to influence demand to regulate the business cycle and improve long-term growth. The neoclassical theory rejects these arguments. According to them, fiscal policy is not effective in regulating the economy. Therefore, low taxes and a balanced budget have a positive impact on the business cycle and long-term growth (Maravalle, Rawdanowicz, 2020).

However, both theories do not take into account the elasticity of tax revenues. The above specifics of theories for the use of fiscal policy may not apply if the taxes used by the government to collect revenue are elastic. Provided that a tax is elastic when inflation rises, it increases budget revenues and limits consumer demand for goods and services (Maravalle and Rawdanowicz, 2020). For these reasons, governments must use elastic taxes. If taxes are not elastic, governments often implement policies that change tax rates(Baunsgaard & Symansky, 2009). Frequent changes in tax rates lead to political instability in the country.

Figure 3 shows the operation of automatic fiscal stabilisers when the economy falls into recession.

Figure 3. Automatic fiscal stabilisers



Source: Baunsgaarda and Symansky (2009).

Automatic fiscal stabilisers (see Figure 3) are a convenient tool for governments to regulate the business cycle and long-term economic growth. As part of fiscal policy, internal and external debt can also stimulate aggregate demand and have a positive effect on growth in the short term, Calderón and Fuentes (2013). According to Elmendorf and Mankiw (1999), the high level of public debt, in the long run, pushes out private investment and worsens economic development. Similar results are confirmed by António et al. (2014). They proved that the increase in government debt leads to lower economic growth. In other words, a low level of government debt has a stimulating effect on the economy, while a high level of debt has a negative effect.

The rational expectation theory places more emphasis on the difference between the long-term and short-run effects of fiscal policy variables. Thus, permanent fiscal expansion can be expected to cause a crowding-out effect by influencing expectations of interest rates and exchange rate persistence (Krugman & Obstfeld, 1997). The crowding-out effect might be additionally magnified if the government's spending appears un-reversible, hence if fiscal policy is not perceived as credible by the private sector. In such cases, fiscal expansion could be perceived as inflationary and thus crowding-out effect through the negative influence of interest rates on investment and growth will be stronger.

The real business cycle hypothesis develops the idea that business cycles can be generated by random fluctuations in productivity. The theory also implies that fiscal policy will converge to a stochastic steady state in which policy varies predictably over the business cycle. Upon entering a boom, expenditure will increase, and tax revenue will fall, but the primary surplus will increase. The overall fiscal stance, as measured by the long-run pattern of debt, is counter-cyclical: public debt decreases in booms and increases in recessions (Battaglini & Coate, 2008). The theory integrates a dynamic political economy model of policy-making of the form used in Battaglini and Coate (2007) with a neoclassical real business cycle framework with serially correlated productivity shocks. The political economy

component of the model assumes that policy choices in each period are made by a legislature. The legislature makes policy decisions by majority rule and legislative policy-making is modelled as non-cooperative bargaining and supports fiscal policies supported by a majority of voters (Battaglini and Coate, 2007). All of the above theories show that through fiscal policy, the government can influence macroeconomic stability by regulating the business cycle and ensuring stable economic growth in the long run. Key aspects in this regard are government revenues and expenditures, the budget deficit, and government debt.

Empirical results of the fiscal policy have been published in different research. According to Gechert (2015), fiscal policy is one of the most important tools of economic management in achieving economic development and eliminating the problems that impede economic stability. He empirically confirms that the distributional and specialised effects of fiscal policy instruments, there are stable effects of the role of government spending and taxes on the overall demand and hence macroeconomic variables.

Ganchev and Todorov (2021)examine three fiscal instruments- direct taxes, indirect taxes and government spending in EU countries with the ARDL method for the period 1999-2020. They proved that fiscal instruments could be used to stabilise Bulgaria's growth in the short run, but they are neutral in the long run. Direct tax revenue, government consumption, and indirect tax revenue are highly effective and can be used as tools for invigorating and stabilising Bulgaria's economic growth in the short run.

Stoilova and Patonov (2020) study the fiscal policy of Bulgaria for the period 1995-2018 with the OLS method. The empirical estimates prove that taxation is a more reliable instrument of fiscal policy than government spending in terms of a small open emerging-market economy. Similar results for the economy of Bulgaria are confirmed by Karagyozova-Markova et al. (2013). They examine the fiscal policy in Bulgaria for the period Q1 1999-Q3 2011. The results of the linear VAR models indicate that the effectiveness of fiscal policy in stimulating economic activity is generally low, as first-year spending multipliers do not exceed 0.4.

Ugwuanyi and Ugwunta (2017) examined the impact of fiscal policy on economic growth in 18 sub-Saharan African countries using the panel data estimation technique under the fixed effect for the period 1990-2012. The empirical results revealed that the government's productive and unproductive expenditures, distortionary tax and non-distortionary taxes have significant effects on economic growth. The findings also revealed that budget balances of sub-Saharan African countries have a positive but insignificant effect on economic growth.

Gurdal et al. (2021) studied fiscal policy in G7 countries (Canada, France, Germany, Italy, Japan, the UK, and the USA) and used annual data for the 1980 to 2016 period. They confirm the positive effects of the taxation policies pursued by the G7 countries on economic growth. The main finding is that the taxation policies to be implemented based on the economic conjuncture of G7 countries are a powerful financial tool with the potential to serve the economic objectives to be achieved.

Babatunde et al. (2017) investigated the influence of taxation on economic growth from 2004 to 2013 in 16 African states using Panel Data. The results confirm a significant and positive relationship between tax revenues, foreign direct investment and economic growth.

Shahmoradi et al. (2019) empirically examined the impact of tax revenues on economic growth in 169 developed and developing countries for the period 2008-2016 using the panel data technique. The results of the analysis revealed that there is a negative and significant relationship between the ratio of tax revenues and GDP in developed countries. Also, they find that there is no significant relationship between tax revenues and economic growth in developing countries.

Stoilova and Todorov (2021) empirically estimate the impact of three fiscal instruments (direct tax revenue, indirect tax revenue and government consumption expenditure) on the economic growth of ten new European Union member states from Central and Eastern Europe (Bulgaria, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia) for the period 2007-2019. The empirical results indicate that the real output growth rate is negatively affected by direct tax revenue, while economic growth in the euro area, exports and gross capital formation are positively related to economic growth. The results also confirm that government consumption and indirect tax revenue have no significant impact on the growth rate of real output of the ten studied countries from central and Eastern Europe.

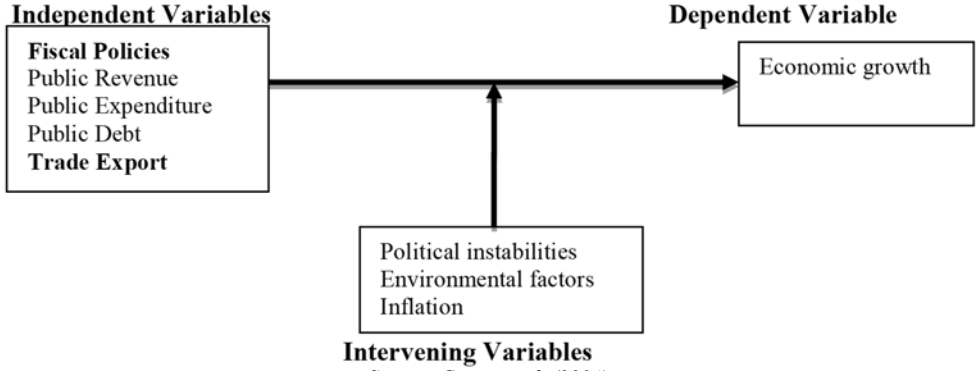
Gllogjani et al. (2021) estimate the influence of the fiscal deficit on economic growth in 6 countries of South-Eastern Europe. With the fixed-effects and dynamic linear regression and data for the period 2005-2019, they confirm the fiscal deficit and economic growth for the transition economies of Southeast Europe, supporting the Keynesian theory. The main findings are that public debt, foreign direct investment, exports, and imports have a positive effect on economic growth. They proved that public debt and imports have a positive influence on economic growth, unlike exports and foreign direct investment, which showed an adverse effect on economic growth.

From empirical studies, the majority of studies (Gllogjani et al., 2021; Stoilova & Todorov, 2021) conducted do not examine the effect of tax revenue, expenditure and public debt in 28 EU countries. In addition, some of the studies were cross-country or time series based, which are prone to many econometrics disadvantages like multicollinearity and omitted variable bias. As a result of the above-mentioned factors, the study found it necessary to devolve into the study to fill the existing void.

2.1 Conceptual Framework

The study argues that public debt, public expenditure, tax revenue and other economic growth variables affect economic growth prospects in European Union economies. In between the dependent and explanatory variables are the intervening factors which aren't controlled for in the study. This relationship is conceptualised in Figure 4.

Figure 4. Conceptual framework analysis



Source: Gisore et al. (2014).

3. Materials and Methods

Our research will adopt longitudinal and cross-sectional research designs to determine the role of fiscal policy in explaining the effect and trend of economic prospects of the European Union member states. This was administrated within the period 1995-2020 using secondary data and a panel ordinary least squares (POLS) estimation approach. The panel data approach was preferred as it permits the control for unobserved individual country characteristics and conditions. The study location was the European union member states. The study selected 27 European countries and Switzerland (Without the United Kingdom). The United Kingdom was left out, considering it has different macroeconomic fiscal policies and conditions in comparison to other European countries. This study employed secondary data set of 28 European countries. The data was collected from the World Bank indicators database, Penn World Tables and some World Bank reports. The brief data description is presented in Table 1.

Table 1. Sources of Data

Variables	Description	Unit of Measurement	Source
$y_{i,t}$	Economic growth	Real Gross Domestic Product growth	World Bank indicators database
$e_{i,t}$	Government Expenditure	Annual total government expenditure (%GDP)	World Development Indicators
$t_{i,t}$	Tax revenue	Aggregate tax revenue collected (% GDP)	World Development Indicators
$d_{i,t}$	Public Debt	Aggregate internal and external debt (% GDP)	World Development Indicators
$x_{i,t}$	Next export	Export (X) minus imports (M), (X – M % GDP)	Penn World Tables

3.1 Econometric Procedure

Building on Mose (2021), a modified econometric growth function was formulated and presented as follows:

$$lnY_{i,t} = \beta lnX_{i,t-1} + \gamma lnF_{i,t-1} + \mu_i + v_t + \varepsilon_{i,t} \quad (3)$$

Where:

$\ln Y_{i,t}$ – the dependent variable – economic growth

$lnX_{i,t-1}$ – set of explanatory variables

$lnF_{i,t-1}$ – the fiscal policy variables

β and γ – are parameters to be estimated

μ_i – country fixed effects

v_t – time fixed effects

$\mathcal{E}_{i,t}$ – the error term and the subscripts *i* and *t* represent country and period, respectively.

Modifying the Solow-Swan theoretical works (Solow & Swan, 1956), the panel model to be estimated is presented as:

$$y = f(e, t, d, x),$$

$$\ln y_{i,t} = \beta_0 + \beta_1 e_{i,t} + \beta_2 t_{i,t} + \beta_3 d_{i,t} + \beta_4 x_{i,t} + \varepsilon_{i,t} \quad (4)$$

Where:

$y_{i,t}$ is a measure of economic growth, which is real GDP at time t in country i.

$e_{i,t}$ – the total expenditure as a share of GDP

$t_{i,t}$ – the tax revenue as a share of GDP

$d_{i,t}$ – the total public debt as a share of GDP

$x_{i,t}$ – the difference between export and import as a ratio GDP to represent net export

$\mathcal{E}_{i,}$ – the error term at time t in country i.

3.2 Panel data analysis

The panel unit root test was employed to check if the variables are non-stationary and if the series possess unit root to reduce the chances of misleading results. Levin-Lin Chu unit test was employed in this study since it has superior test power for the long-run relationships in panel data than Im-Pesaran and Shin, which begin by specifying a separate ADF regression for each cross-section with individual effects and no time trend.

$$\Delta y_{it} = \alpha_i + \rho_i y_{i,t\ 1} + \sum_{j=1}^{p_i} \beta_{ij} \Delta y_{i,t\ j} + \varepsilon_{it} \quad (5)$$

Where:

$i = 1, \ldots, N$ and $t = 1, \ldots, T$

The second step is to check if the variables have a long-run relationship; this study will apply the Kao co-integration test. The co-integration procedures proposed by Kao make use of estimated residual from the hypothesised long-run regression of the following form:

$$y_{i,t} = \alpha_i + \delta_i t + \beta_{1i} x_{1i,t} + \beta_{2i} x_{2i,t} + \ldots + \beta_{Mi} x_{Mi,t} + e_{i,t} \quad (6)$$

for t = 1,…..,T; i = 1,….,N; m = 1, …., M,

Where:

T is the number of observations over time;

N – number of cross-sectional units in the panel;

M – number of regressed variables.

In this set α_i up, the member-specific intercept or fixed effects parameter varies across individual cross-sectional units. The same is true of the slope coefficients and member-specific time effects $\delta_i t$.

The study adopted panel ordinary least squares (POLS) as an estimation technique to analyse the relationship between the study variables. Panel data can be estimated by two methods, fixed or random effect model as selected by Hausman (1978) test. One advantage of the fixed effects model is that it allows the unobserved individual effects to be correlated with the included study variables. Some panel diagnostic estimation analyses were applied in the regression model to qualify the result, such as heteroscedasticity and serial correlation.

4. Results and Discussions

4.1 Descriptive matrix result

A normality test is employed in most studies to test whether the elements employed in the analysis are normally distributed. The common test for normality is the Jarque-Bera statistics test (Jarque& Bera, 1980). This test utilises the mean-based coefficient of skewness and kurtosis to test the normality of all the study elements. On the one hand, skewness measures the direction and degree of asymmetry. During this study, results indicate normal curves for all the variables, with positive values of skewness indicating a tail to the left. This suggests that the positively skewed variables were high during the start years but are progressively declining over the years. The negatively skewed variables show an increasing trend during the latter years. From the Kurtosis result, all the variables have a kurtosis value of more than three which suggests the variables have Leptokurtic distribution. Extreme negative or positive skewness implies that the European economy may experience high or extreme returns due to changes in the independent variable. Table 1 below shows a summary statistics of target variables.

Table 1. Descriptive Statistics Results

Variable	Observations	Mean	Standard Deviation	Skewness	Kurtosis
y	728	379176.7	618232.3	2.549	9.334
t	728	170708.0	289905.7	2.619	9.525
e	728	180578.6	305233.9	2.547	8.933
x	728	138867.9	221312.9	3.471	18.668
d	728	277490.7	533438.2	2.614	9.030

Source: Prepared by the authors (Data: Eurostat)
Notes: y- Gross Domestic Product (GDP) (a proxy for economic growth), t– tax revenue, e- government expenditure,x–Total export, and d– Public debt.

Bivariate correlation was used to evaluate the degree of relationship between study variables. The absolute value of the coefficient of correlation ranges from 0 to 1. In general, from Table 2 results, most independent variables seem to be positively correlated between themselves. Table 2 shows the correlation results.

Table 2. Correlation matrix

y	r	e	d	x	
1.0000	0.9939	0.9915	0.9369	0.7749	y
	1.0000	0.9979	0.9435	0.7697	t
		1.0000	0.9491	0.7526	e
			1.0000	0.7023	d
				1.0000	x

Source: Prepared by the authors.

4.2 Panel econometric results

The Levin-Lin-Chu unit root test was employed to eliminate any possibility of spurious regressions and erroneous results. This involved determining the order of integration of the time series through the unit root test. Accordingly, Levin-Lin-Chu's results are reported in Table 3.

Table 3. Panel Unit Root Test Results

Variables	Levin-Lin-Chu at Level		Order	LLC at First difference		Order
	Statistics	*Probability*		*Statistics*	*Probability*	
y	0.159	0.4370	*I(0)*	-9.345	0.0000	*I(1)*
t	0.180	0.5718	*I(0)*	-11.139	0.0000	*I(1)*
e	6.991	1.0000	*I(0)*	-6.51645	0.0000	*I(1)*
x	1.956	0.9748	*I(0)*	-10.905	0.0000	*I(1)*
d	6.717	1.0000	*I(0)*	-2.388	0.0085	*I(1)*

Source: Prepared by the authors.

The unit root results reveal that all study variables are non-stationary at the level. However, they become stationary after the differencing, implying that the variables are integrated into order one, I (1).

The Hausman test results (p-value is 0.00<0.05) suggest a rejection of the alternate hypothesis. Hence the null hypothesis is accepted, and therefore, the panel fixed effect model is chosen. One advantage of the fixed effects model is that it allows the unobserved individual effects to be correlated with the other variables. Table 4 reports the results of the fixed regression analysis.

Table 4. Fixed Effect Regression Results

Variables	**Coefficient**	**Standard error**	**t- Statistics**	**P-value**
t	1.706761***	0.089724	19.02237	0.0000
e	0.140714*	0.085034	1.654797	0.0984
x	0.098932***	0.014211	7.052347	0.0000
d	-0.039464***	0.014211	-2.777029	0.0056
Cons	59621.43***	4304.952	13.84950	0.0000
The goodness of Fit Test	**R^2 = 0. 958830**		**Adjusted R^2 = 0. 958603**	
F-Statics	**F=5517.525**		**P-value(F) = 0.000**	
Wooldridge Test	**F(1,27) = 173.064**		**Prob > F = 0.000**	
Modified Wald Test	**χ2 (28) = 3.047**		**Prob> χ2 = 0.000**	
Pesaran CD	**(z) = -1.38348**		**Pr = 0.463**	
Hausman Test	**χ^2 (4) = 28.070**		**Prob> χ^2 = 0.000**	

Source: Prepared by the authors.

The regression result reveals that public tax revenue is positively significant in European Union to economic growth at a five per cent level of significance. This suggests one per cent increase in revenue collection will translate to about a 1.7 per cent increase in economic activities. According to Keynes's theory, the relationship between economic growth and taxes is negative. The taxes decrease the welfare function of the economic agents and thus slow economic growth. Empirically this is confirmed by Khumbuzile and Khobai (2018), Dackehag and Hansson (2012), and Alinaghi and Reed (2021). There are many empirical studies which confirm a positive relationship between economic growth and taxes, such as Mercan et al. (2010), Kalaš et al. (2018), Gaszzzazhi, Asllani and Boqoll (2018), and Moyo, Samour and Tursoy (2021). The positive relationship means that the taxes are compatible with economic growth and able to influence growth through funding physical capital and human capital (Stoilova, 2017). This finding supports why Tax receipts as a share of GDP in 27 EU countries during 1995-2020 increased from 24,8% to 26,7%. According to Taqi, M. et al. (2021), the overall tax has a positive relation with economic growth. Therefore, the total taxes in 28 EU countries do not decrease economic growth.

The government expenditure was positively significant in European Union to economic growth at a ten per cent level of significance. This suggests one per cent increase in public spending will translate to about a 0.14 per cent increase in economic activities. This finding supports policy action recommended by Bretton Woods Institutions (Mitchell, 2005). Further, per Keynesian scholars, expenditure can contribute positively to economic expansion through the increased purchasing power of the local population (Romer,1996). As a result, public consumption spending augments the total demand, which stimulates an increased output by betting on expenditure multipliers and funding key infrastructure projects (Gisore et al. 2014).

Public debt was negative with economic growth in European Union member states. According to Babu et al. (2015), extensive use of domestic borrowing can have severe repercussions on the economy. Domestic debt service can consume a significant part of government revenues, especially given that domestic interest rates are higher than foreign ones. From the findings, increased external and internal debt will lead to low economic growth attributed to the crowding out effect and increasing interest rates or debt payment.

Trade export is positively significant in European Union. Export earns the necessary foreign exchange for a country and increases productivity through competition and innovation and thus translating to economic growth (Murphy et al. 1991).

The coefficient of determination (adjusted R2) shows that 95 per cent of the dependent variable is explained within the model. The F-test result indicates that all the independent variables have explanatory power at a 1% level of significance. This indicated that the overall goodness of fit was satisfactory. From the above regression result, cross-sectional dependence/contemporaneous correlation is not a problem. Heteroscedasticity and autocorrelation were detected in the panel regression model. This study used panel robust standard error to correct it.

5 Conclusion and Recommendations

This study explored the indication of how the increase in government expenditure, tax revenue, public debt and net export leads to an increase in economic growth in European countries. The results reveal that there is a positive relationship between government expenditure, tax revenue and economic growth. On the other hand, public debt negatively affects the European Union's economic growth. From the findings, therefore, adjustments at both levels of revenues and changes in the structure of the tax system can influence economic activity. Tax cuts offer the potential to raise economic growth by improving incentives to work, save, and invest. But they also create income effects that reduce the need to engage in productive economic activity, and they may subsidise old capital, which provides windfall gains to asset holders that undermine incentives for new activity. The net effect of the tax cuts on growth is thus theoretically uncertain and depends on both the structure of the tax cut itself and the timing and structure of its financing.

Expenditure growth can facilitate physical and human capital development and, thus, productivity which will translate to growth. The government's action for attaining economic growth ultimately depends on the fiscal space available for it to initiate spending, reorder the existing expenditures, implement tax cuts and increase net exports. The expenditures depend on the access to financing at a reasonable cost since prospective lenders believe that additional spending and borrowing would put much pressure on the economy and result in to delay in recovery as many resources will be taken from the private sector.

The high rate of public deficits has raised concerns about the financial health of many economies. Though governments can be able to run moderate fiscal deficits for extended periods, with domestic and international financial markets and international and bilateral partners convinced of their ability to meet present and future obligations, deficits that grow

too large and linger too long may, however, undermine that confidence. Being cognizant of these risks calls for the establishment of a fiscal policy strategy that would help ensure solvency. It should at least be committed to fiscal correction once the unfavourable conditions improve; structural reforms should be identified and implemented to enhance growth. The deficit should be maintained within manageable limits and avoid the unsustainable budget deficit, which could have undesirable macroeconomic costs and the government's macroeconomic objectives, such as low inflation and high economic growth, might be in jeopardy. For more clear recommendations, there's a necessity for further revenue source data disaggregation into debt and tax revenue for deeper policy prescription.

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