



*Research article*

## **Examining the relationship between public debt and private consumption in European OECD countries (2011–2020)**

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**Abstract:** This study examined the impact of public debt on private consumption in 26 European Organization for Economic Co-operation and Development (OECD) member countries from 2011 to 2020. Analyzing data from OECD, World Bank, and International Monetary Fund reports, we employed various statistical methods, including correlation analysis, linear regression, fixed effect, random effect, and the Generalized Method of Moments model via the Arellano-Bond estimation approach. Our findings indicated that public debt, foreign direct investments, inflation, and gross domestic product (GDP) growth positively influence private consumption, while gross fixed capital formation and exports of goods and services have a negative impact. The study underscores the need for careful consideration of the repercussions of public debt on citizens’ daily lives, especially in terms of private consumption, emphasizing the crucial need for policymakers to consider the delicate balance between public debt management and sustainable economic growth in OECD countries for shaping effective economic policies that foster responsible debt management to support long-term economic development.

**Keywords:** public debt; private consumption; investments; inflation; economic growth

**JEL Codes:** E21, E22, D12, E31, H62, H63, F43

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## 1. Introduction

Public debt stands as a significant challenge for nations globally, driven by the complexities of globalization, free economies, technological advancements, and interconnected national economies. The relentless pursuit of improving and advancing the standard of living has escalated people's demands in every state, compelling governments to increase public spending and investments. However, this surge in demands, coupled with the state's constrained supply capacity, often leads to annual expenditures and investments surpassing the generated income, resulting in budget deficits. This study focuses on the critical issue of how European countries, as members of the OECD, have managed public debt during the period 2011–2020 and explores the impact of this debt on their economic growth. The heightened standard of living for citizens has posed challenges for European governments in managing state revenues, leading to the necessity of external and internal public debt. The objective of borrowing this public debt is to mitigate adverse effects from macroeconomic factors and enhance positive impacts on the economic growth of these countries. Of particular interest is the examination of the relationship between public debt and private consumption, a pivotal component of economic growth. This study aims to elucidate how governments' management of public debt in these countries influences the private consumption patterns of households and businesses, particularly given the recurring challenges faced by governments worldwide. The ensuing findings will contribute to the academic discourse on the effectiveness of public debt management and its enduring impact on private consumption amid the evolving socio-economic landscape.

In recent years, several different authors (e.g., Berben and Brosens, 2007; Kusairi et al., 2019; Morina and Berisha, 2021; Pozzi et al., 2004) have analyzed the effect of public debt in private consumption of different countries of the world. In their study Berben and Brosens (2007) point out that OECD countries with a higher level of public debt result in a fiscal expansion partially hindered by the decline in private consumption of households and businesses in these countries. Whereas, in OECD countries characterized by a low level of public debt, private consumption is insensitive to changes in government debt. So, according to the empirical findings of this study, in countries with high public debt, the level of government debt negatively impacts private consumption. Kusairi et al. (2019) in their study concluded that public debt positively impacts the growth of private consumption in Asia Pacific countries. Also, these authors emphasize that income, capital accumulation, government spending, real interest rate, and inflation positively affect private consumption in these countries.

The study of Morina and Berisha (2021) finds that public debt has no impact on private consumption in countries in transition. Because in economies with a low level of public debt, this debt is not essential for private consumption. The insignificant impact of public debt on private consumption in transition countries is acceptable and can be argued with empirical evidence. Pozzi et al. (2004) supported the idea that a high public debt prompts lenders to tighten lending conditions. So, according to this study, it is suggested that stabilization policy can be more effective (Keynesian) with high rates of public debt.

The empirical results of this study will benefit society in general because the governments of different countries will have scientific evidence for how to manage their public debt and how to allocate these public debt funds in the function of the growth of private consumption. So, policymakers in these countries can design an appropriate investment strategy, where all funds from public debt can be allocated to capital investments that will generate higher income for businesses and households in the function of the growth of private consumption. Since this study has empirically proven this positive

effect between public debt and private consumption, pursuing such a strategic policy in managing public debt will bring benefits to society and, in general, to the economies of these countries. The scientific importance of this paper lies in the fact that two critical macroeconomic components have been analyzed: public debt and private consumption. The results of this study will be able to serve as a good reference base for the government of these countries' Central Banks, the Ministry of Finance, and other decision-making actors. Since, in this study, developed countries are mainly analyzed, it is crucial to see how these countries use public debt while also achieving sustainable economic growth. So, these relevant institutions in the future will be able to make decisions on how to manage the public debt in the function of the increase in private consumption, where they will bring more benefits to society and the economy of these countries in general.

This scientific paper is structured into six distinct sections. In Section 2, a comprehensive literature review is presented, synthesizing the empirical findings of various scholars who have examined the relationship between public debt, economic growth, private consumption, and other macroeconomic factors. This section serves to contextualize the correlation between the primary variables of interest in the study. Section 3 outlines the scientific research methodology and specifies the econometric model employed. A detailed exposition is provided regarding the sample and data utilized, encompassing variable measurements, model definitions, and the statistical tests undertaken for data analysis. In Section 4, a comparative analysis of linear trends is conducted. This analysis delves into the ratio of public debt to private consumption within European OECD member countries. The section presents the results of the econometric analysis, empirical findings, and hypothesis testing derived from the study. Moving forward to Section 5, discussions are presented, offering insights and interpretations of the findings obtained. This section facilitates a deeper understanding of the implications and significance of the study's results. The concluding segment of the paper, found in the final section, encapsulates the study's conclusions, recommendations, and practical implications derived from the research findings.

## 2. Literature review

The value of goods and services purchased by households and businesses makes up total private consumption. Private consumption is an important indicator that shows how much the country has grown in GDP. The high budget deficit and public debt level directly affect private consumption, so there is a fair relationship. When the government of a country decides to finance the budget deficit through debt, either internal or external debt, then in the short term, this will not have an impact on the incomes of families and businesses and on the level of private consumption. So, private consumption will not be affected by debt or budget deficit.

In the long term, the state will force itself to generate income that will be used for the payment of interest rates and the debt it has received. The fair and accurate division of state expenditures into short-term and capital expenditures that bring long-term income and economic development is the first step a state must take to alleviate the budget deficit and public debt. Financing or investing in capital projects that will bring long-term income will prevent the state from being forced to increase tax rates. This will make the income generated from investments get used to pay public debts and interest. Not dividing the public expenses fairly and financing short-term expenses with debt-secured means will force the government to generate tax revenues in the long-term by increasing tax rates to

pay the public debt. Public debt will again affect private consumption in the long term due to reduced household and business income.

Leibfritz et al. (1994) in their study found that monetary policy played a crucial role in generating economic recovery and the effects of fiscal policy through fiscal consolidation in OECD countries are achieved depending on the level of economic stability. However, if economic growth is slow, then the governments of these countries will make further efforts to keep the public debt under control through fiscal consolidation. The study of Checherita-Westphal and Rother (2011) investigated the average impact of government debt on GDP growth in twelve Eurozone countries over about 40 years starting in 1970. These authors found a nonlinear impact of public debt concerning the gross domestic product in the long term. According to Fincke and Greiner (2013), there is a negative correlation between public debt and economic growth in seven developed countries from 1970–2012. Whereas, according to Ostry et al. (2015), the inherited public debt represents a heavy burden on the economy, reducing its investment potential and economic growth prospects. However, when the fiscal space is ample, public debt management is more efficient, and more opportunities are created from the available income to realize its repayment in future periods.

Lee and Ng (2015) have examined whether the public debt contributed to Malaysia's economic growth (1991–2013). Economic growth, measured by GDP per capita, negatively correlates with public debt. The study by Bolat et al. (2016) found that in the United Kingdom, the government did not raise the primary surplus with the increase in the government debt but decreased it, and this reduction was significant for the economy of this country. According to Butkus and Seputiene (2018), the impact of public debt on economic growth depends on institutional aspects. Even if we have stable institutions, it is not enough to prevent the negative effect of debt. Morina and Misiri (2019) in their study, have found that taxes, public debt, and subsidies have had a positive impact on the budget deficit of the Western Balkan countries. According to Silva (2020), private and public external debt increases public investment, and private external debt reduces private investment. Therefore, the external debt in Portugal has not been allocated to positively and significantly increase economic growth. Burriel et al. (2020) in their study, point out that economies with high public debt may lose more output during a financial crisis, face an accumulation of private debt in the short and long term, and have less room for countercyclical fiscal policy.

According to the findings of Kose et al. (2020), the cost of repaying public debt can increase significantly during periods of financial stress and result in financial crises. High public debt levels can limit governments' ability to provide fiscal stimulus during economic downturns, and high debt can hamper investment flows and long-term economic growth. Ghourchian and Yilmazkuday (2020) show that the adverse effects of government consumption are relatively higher than the harmful effects of government debt. These restrictions on government debt are shown to be more critical for countries with greater trade openness, lower inflation, or greater financial depth. Fetai and Avdimetaj (2020) emphasize that the lower level of public debt in the Western Balkans countries has a positive effect on economic growth, but beyond a certain threshold level, it turns into a negative effect on economic growth. The econometric results of the study by Salmon (2021) show that an increase of 1 percentage point in the ratio of government debt to GDP would reduce real GDP growth by about 0.01 percentage points, while an increase of 1 percentage point in the ratio of government consumption to GDP leads to a decline in real economic growth.

Referring to the study by Hilton (2021), it is emphasized that public debt has no causal relationship with GDP in the short term but has a one-sided causality with economic growth in the

long term. Spyrakis and Kotsios (2021) found that fiscal recovery accompanied by fiscal consolidation is achievable, and the tax rate and public spending are needed to adjust the debt-to-GDP ratio. The econometric model developed in this study suggests that they should follow similar trajectories, whether in economic growth or decline. Butkus et al. (2021b) concluded that public debt statistically has a significant negative effect on marginal growth that begins to appear at a lower ratio of public debt to GDP. According to Misiri et al. (2021) public debt has a positive impact on the economic growth of Kosovo, implying that the low level of public debt has ensured financial stability at the national level. The allocation of funds obtained through public debt in the function of capital investments has also positively influenced the economic development of this country.

According to the study by Rajabi (2021) the government's budget deficit has a positive and significant impact on cost efficiency for ensuring sound public finance policy, which is vital to ensure sustainable economic development within the euro area. Dominese et al. (2021) in their study, identified that the consequences of the monetary policy of the European Central Bank were more pronounced in 2020 when unprecedented financial stimulus measures were implemented in the fight against the impact of COVID-19, which resulted in a decline in government bond yields in Southern Europe to record lows. Referring to the study by Shahini and Muço (2022), it is found that public debt has a positive impact on the economic growth of the Western Balkans, regardless of its level, and that the increase in corruption in these countries harms economic growth. Inflation is an essential macroeconomic factor affecting the correlation between public debt and economic growth. Therefore, in their study, Fetai and Misiri (2022) discovered a statistically significant negative and non-linear correlation between inflation and economic growth, showing that the threshold of inflation is 3.90%, and any level above 3.90% brings adverse effects on economic growth in countries of the Western Balkans.

Public debt, a critical facet of fiscal policy, warrants a nuanced exploration, considering various dimensions such as the Euro and non-Euro contexts, distinctions between long- and short-term debt levels, and the accumulated debt across European countries as shown in Table 1.

**Table 1.** Public debt in European countries: A comprehensive examination.

Economic phenomenon	Implications	A comprehensive examination
Euro and non-Euro dynamics	Eurozone challenges	Within the Eurozone, countries face a unique set of challenges due to a shared currency. Member states relinquish control over monetary policy, relying heavily on fiscal measures to address economic imbalances.
	Non-Euro countries	Nations outside the Eurozone retain monetary autonomy but may face currency volatility. Their fiscal policies play a pivotal role in managing debt and promoting economic stability.
Long-term vs. Short-term debt levels	Short-term impact	In the short term, financing budget deficits through debt issuance might not immediately impact private consumption. Governments may utilize this strategy to stimulate economic activity without an immediate burden on households and businesses.
	Long-term implications	Over the long term, governments must grapple with the consequences of accumulated debt. The allocation of resources to capital projects that generate sustained income becomes imperative to mitigate adverse effects on private consumption.
Accumulated debt in European countries	Diverse debt profiles	European countries exhibit diverse debt profiles, influenced by historical, economic, and policy factors. Southern European countries often grapple with higher debt burdens, while northern counterparts may maintain lower levels.
	Policy responses	Each country's approach to public debt management varies. Some nations adopt stringent fiscal policies to curb debt accumulation, while others may leverage debt strategically to fund developmental projects.
Macroeconomic factors influencing public debt	Gross fixed capital formation (GFCF)	The relationship between GFCF and public debt involves assessing how investments in fixed assets contribute to economic growth and debt sustainability.
	Foreign direct investment (FDI)	Understanding how FDI impacts public debt and, in turn, private consumption, sheds light on the role of international capital flows in economic dynamics.
	Inflation dynamics	The interaction between inflation and public debt reveals the challenges of managing debt in the face of price fluctuations and their implications for economic growth
	Export dynamics	Analyzing the relationship between exports and public debt provides insights into how trade policies influence debt levels and, consequently, private consumption.
	GDP growth	The negative impact of GDP growth on private consumption underscores the intricate relationship between overall economic performance and individual spending patterns.

By delving into these dimensions, this study aims to contribute a more comprehensive understanding of the theoretical underpinnings of public debt in European countries. It recognizes the complexity of managing debt within the Eurozone, considers the temporal dynamics of debt, and acknowledges the diverse debt landscapes across European nations. This multifaceted theoretical background lays the foundation for a nuanced empirical analysis of the interplay between public debt and private consumption.

The study by Avdimetaj et al. (2022), has the focus on understanding the relationship between public debt and private consumption in developing European countries. Employing data from international financial institutions and advanced econometric methods, the study identifies a

non-linear relationship, indicating that an increase in public debt adversely affects private consumption expenditures (Avdimetaj et al., 2022). This finding underscores the importance of comprehending the dynamics between public debt and private consumption for formulating effective economic policies in developing nations.

Gogas et al. (2014) contributes to the study by examining the long-run relationship between public debt and private consumption in fifteen OECD countries. Contrary to the Ricardian equivalence proposition, their empirical findings fail to support this theory across the entire sample. The study highlights the challenges faced by policymakers striving for balanced government budgets and emphasizes the complexities associated with the public debt-private consumption relationship (Gogas et al., 2014).

Coccia's studies, particularly those comparing the evolution of public debts and government deficits in European countries, contribute valuable insights into the intricate relationships between public debt, private consumption, and economic growth. These insights are crucial for policymakers seeking nuanced perspectives to inform decision-making in the face of significant differences and potential contributing factors to negative socioeconomic effects on the overall European Union economy (Coccia, 2017, 2019). On the other hand, Butkus et al. (2021a) focuses on the factors conditioning the turning point of the public debt-growth relationship. Their study estimates thresholds of indicators in the post-global financial crisis and COVID-19 pandemic era, providing nuanced insights into the relationship between public debt and economic growth.

Javed and Husain (2022) delves into the influence of government expenditure on Oman's economic growth, identifying significant negative predictors, including government expenditure, personal consumption expenditure, and public debt. The findings offer valuable insights for policymakers to recognize the role of government expenditure in shaping Oman's economic development. Additionally, Coccia and Benati (2023) study the impact of the COVID-19 pandemic on European countries, emphasizing the critical role of government debt in creating structural vulnerabilities and affecting countries' ability to respond to crises such as the pandemic. Lastly, Röhrs (2016) analyzes the determination of public debt in a dynamic politico-economic model that contributes further insights, underlining the potential impact of the absence of commitment on public debt levels based on the elasticity of substitution between public and private consumption.

Regarding the paper by Caner et al. (2021), the authors conduct an empirical analysis to investigate the joint influence of public and private debt on economic growth. Utilizing a dynamic panel data model that considers the endogeneity and interlink of both debt variables, the study identifies a threshold effect in the interaction between public and private debt. Specifically, when the aggregate debt to GDP ratio surpasses 220%, a negative and significant impact on economic growth is observed. The paper emphasizes the underestimation of the true effect of individual debt if the interactive effect is neglected. Additionally, the authors decompose private debt into household and corporate components, revealing that the public-private debt interaction operates through channels involving household debt and public debt. The study also explores the robustness of threshold effects across various factors such as banking crises, output volatility, institutional quality, taxes, private and public pension savings, participation rate, and potential outliers, providing a comprehensive analysis of the complex relationship between debt and economic growth in 29 OECD countries.

The literature review presents a summary in the form of a meta-analysis where the empirical findings of many studies by other authors have been analyzed. A considerable number of these authors have analyzed the effect of public debt on economic growth in developed countries, developing

countries, and countries in transition. However, very few empirical studies deal with the correlation between public debt and private consumption in the economies of different countries, especially in European countries that are members of the OECD. Through this study, we will try to contribute to this issue, supplementing the existing literature in the field of macroeconomics as well as investigating how the increase in public debt will affect private consumption in European countries that are members of the OECD. This research will also try to determine how other macroeconomic factors (gross fixed capital formation, foreign direct investment, inflation, export, and GDP growth) have affected the final consumption expenditure of European OECD countries.

### **3. Scientific research methodology and econometric model specification**

#### *3.1. Sample and data*

In this study, quantitative methods and techniques were applied through secondary data. The reason for applying secondary data is that these statistical data are more accurate and reliable in terms of their relevance and originality. These statistical data are published by relevant institutions such as the OECD, the International Monetary Fund, the World Bank, the European Central Bank and Eurostat. The countries included in the sample of this study are Austria, Belgium, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland, and the United Kingdom. To answer this study's research questions and explain the correlation between public debt and private consumption, five other independent variables are included in the econometric model, which controls the effect between the main variables of this study.

#### *3.2. Measures of variables*

The main objective of this study is to analyze the correlation and impact of public debt on private consumption in the 26 countries selected. In order to explain and explore the correlation between public debt and private consumption, the effects of five other independent macroeconomic variables that control the level of influence of public debt on private consumption were also taken into account. These independent control variables are gross fixed capital formation, foreign direct investment, inflation, export, and gross domestic product growth. In this study, 26 European member countries of the OECD are included, and the statistical data applied in this research include the ten years, respectively, the period 2011–2020.

Final consumption expenditures are a dependent or endogenous variable that depends on the influence of other independent variables such as public debt, gross fixed capital formation, foreign direct investment, inflation, export, and GDP growth. Econometric evaluations, interpretation, and testing of the validity of the hypotheses are made through these statistical tests: descriptive statistics, correlation analysis, linear regression, fixed effect regression, random effect regression, Hausman Taylor estimation, Generalized Method of Moments (GMM) model (Arellano-Bond estimation, Arellano-Bover/Blundell-Bond estimation, linear DPD estimation), and the generalized estimating equations (GEE) model. All these types of panel data statistical tests that have been applied in this



study reflect more significant support for the empirical findings, the level of statistical significance, and the scientific relevance of this study.

### 3.3. Models and data analysis procedure

In this part of the scientific research methodology, the econometric model and the specification of the independent and dependent variables of this study are presented. In this study, as a dependent variable, we used private consumption, which represents final consumption expenditure that is an essential component of economic growth for the countries included in the analysis of this study. Controlling or independent variables that explain and control the dependent variable of this study are: gross fixed capital formation, foreign direct investments, inflation measured through the consumer price index, export, and the growth of the gross domestic product.

The econometric model shows that the dependent variable  $Y$  (private consumption) is expressed as a function of the independent variables:

$$Y = f(X_1, X_2, \dots, X_n) + \varepsilon \quad (1)$$

where  $\varepsilon$  shows the normal distribution.

*Private consumption = f (determining factors of private consumption and the impact of public debt on final consumption expenditure).*

$$FCE = f(PD, GFCF, FDI, CPI, EGS, GDP\_GROWTH) \quad (2)$$

The main hypothesis of this study is:

*H1: Public debt has positively influenced the final consumption expenditure of European OECD countries.*

Table 2 provides a comprehensive description of the variables incorporated into the econometric models utilized in the study. Each variable is delineated, offering clarity and insight into their respective roles within the analysis.

**Table 2.** Description of variables included in econometric models.

Variables	Variable description	Data source
Dependent variable	Final consumption expenditure (FCE)	OECD, World Bank and IMF Annual Reports (2011–2020)
Independent variable	Public debt (PD)	OECD, World Bank and IMF Annual Reports (2011–2020)
Independent variable	Gross fixed capital formation (GFCF)	OECD, World Bank and IMF Annual Reports (2011–2020)
Independent variable	Foreign direct investments (FDI)	OECD, World Bank and IMF Annual Reports (2011–2020)
Independent variable	Consumer price index (CPI)	OECD, World Bank and IMF Annual Reports (2011–2020)
Independent variable	Export of goods and services (EGS)	OECD, World Bank and IMF Annual Reports (2011–2020)
Independent variable	Gross domestic product growth (GDP_GROWTH)	OECD, World Bank and IMF Annual Reports (2011–2020)
Independent variable	Eurozone_Dummy	OECD, World Bank and IMF Annual Reports (2011–2020)

To prove the validity of the hypothesis of this study, we have built this econometric model as follows:

$$FCE_{it} = \beta_0 + \beta_1 PD_{it} + \beta_2 GFCE_{it} + \beta_3 FDI_{it} + \beta_4 CPI_{it} + \beta_5 EGS_{it} + \beta_6 GDP\_GROWTH_{it} + Eurozone\_Dummy + \gamma_{it} \quad (3)$$

where:

*FCE* – Final consumption expenditure

*DP* – Public debt

*GFCE* – Gross fixed capital formation

*FDI* – Foreign direct investment

*CPI* – Consumer price index

*EGS* – Export of goods and services

*GDP\_GROWTH* – Gross domestic product growth

$\beta_0$  – Represents the constant or value of variable *Y* when all values of *X* are zero

$\beta_1 - \beta_6$  – Regression coefficients for relevant independent variables

$\gamma$  – Stochastic variables (other factors not considered in the model)

*i* – Code

*t* – Time period (2011–2020)

**Final consumption expenditure (FCE)** – the expenses of resident economic and institutional units, including households and businesses, which make these expenses for goods or services used for the direct satisfaction of individual and collective requests or desires of community members. This category of private consumption includes expenditures for goods and services, consumption of garden produce and rent expenditures intended for residents. According to Eurostat, the categorization of consumption expenditures is based on three sources of data: the household budget survey, national accounts, and the harmonized index of consumer prices (Gerstberger and Yaneva, 2013). Final consumption expenditure represents the dependent variable of this econometric model and is expressed as a percentage of the gross domestic product.

**Public debt (PD)** – represents the total amount, including total liabilities, borrowed by the government to meet its budget intended for the economic development and financial stability of the country. According to Greiner and Fincke (2015), when aggregate demand is low and unemployment high, the government of a country must become more active to restore complete employment equilibrium, which then reduces the outstanding public debt. So, the governments of different countries of the world must finance public and capital investments that bring long-term benefits from public deficits so that future generations can contribute to their financing. Public debt represents the primary independent variable in this study and is expressed as a percentage of gross domestic product.

**Gross fixed capital formation (GFCE)** – represents the value of tangible and intangible (durable) goods for non-military purposes, purchased by resident economic-producing units to be used at least for one year in the production process, as well as the value of services included in fixed capital goods (Gibescu, 2010). The formation of gross fixed capital represents the first controlling, and exogenous variable in this econometric model and this variable is also expressed as a percentage of gross domestic product.

**Foreign direct investments (FDI)** – in the literature of international economics are considered instruments for countries' economic growth, especially developing ones. These investments imply the existence of a long-term relationship between the direct investor, an economic entity resident in

one economy, and the direct investment undertaking, representing an economic entity resident in another economy. This relationship entails a significant level of influence of the investor in the management of the enterprise (Chaudhuri and Mukhopadhyay, 2014). Foreign direct investments represent this study's second controlling exogenous variable, and this controlling variable is expressed as a percentage of the gross domestic product.

**Consumer price index (CPI)** – provides a measure of monthly household goods and services prices. Inflation (increase in prices) and deflation (decrease in prices) are reported through this index. Both of these economic phenomena can damage the macroeconomic stability of a country. According to Biggeri and Laureti (2010), the consumer price index refers to the temporal and spatial dimension of price differences in the consumer's basket. Therefore, the results obtained by this index are different according to the basket of goods and services. The consumer price index represents the third controlling variable, an exogenous variable in this study's econometric model. Consumer price index (CPI) was measured through the Laspeyres formula, where the values of this index represent the averages of each given period.

**Export of goods and services (EGS)** – consists of business transactions in goods and services (sales, exchanges, and gifts) from residents to non-residents. The export of goods and services represents the fourth controlling and exogenous variable in this study, which is expressed as a percentage of the gross domestic product. So, when the economic ownership of goods and services changes between residents and non-residents, goods and services are exported. According to Gabriele (2006), the increase in exports of services and goods should be considered an essential economic instrument that contributes positively to the broader economic and social development, especially in developing countries.

**Gross domestic product growth (GDP\_GROWTH)** – represents GDP's annual percentage growth rate, referring to market prices. These prices are adjusted to local currency and aggregates based on constant 2010 dollars. GDP growth represents the last control and exogenous variable in this study, and this variable is expressed as a percentage change in economic growth from one period to the next.

#### 4. Results

In this study, the ratio of public debt and private consumption in European OECD countries have been compared through the analysis of linear trends. Table 3 presents data on public debt and private consumption for European countries that are members of the OECD for 2016–2019.

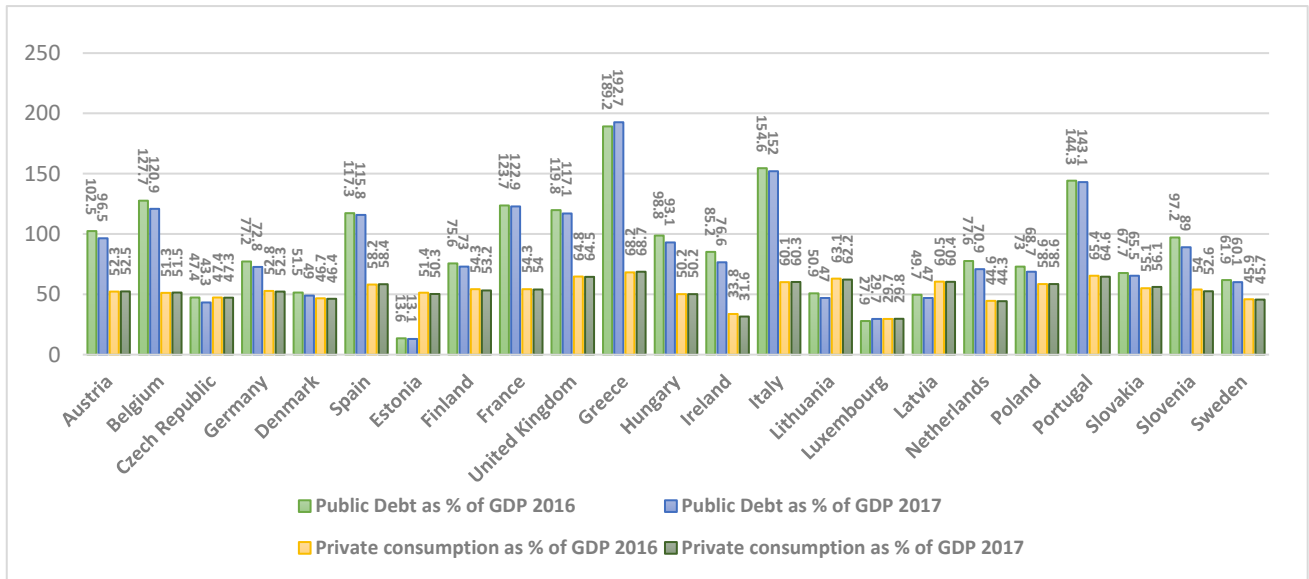
Table 3 show the ratio of the participation of the public debt in the GDP of the European member states of the OECD. From the data above, we see that Greece, Italy, and Portugal are the countries with the highest level of public debt. Public debt in Greece has an average participation of 194.4% in GDP. Comparing the reports in Greece over the years, we see that the public debt has increased. In 2016, the participation was 189.2%, while in 2019, it increased to 200.7%. Italy has an average ratio of 151.9%. During these four years, in 2018, participation had decreased to 146.8% compared to 2016 and 2017, when participation was 154.6% and 152%, respectively. In 2019, the level of public debt had increased again to 154.5%. Portugal, on the other hand, has had a downward trend during this period. In 2016, the ratio of public debt participation in GDP was 144.3%, while in 2019, it decreased to 136%. On the other hand, figure 1 illustrates the analysis of the linear trend between public debt and private consumption in the GDP of European OECD countries for the years 2016 to 2017. The graph visually

presents the relationship between public debt and private consumption, providing insights into their potential correlation or trends over the specified time period.

**Table 3.** Comparative analysis of the participation of public debt and private consumption in the GDP of European OECD countries (2016–2019).

Variables:	Public debt as % of GDP		Private consumption as % of GDP		Public debt as % of GDP		Private consumption as % of GDP	
	2016	2017	2016	2017	2018	2019	2018	2019
States/Years	2016	2017	2016	2017	2018	2019	2018	2019
Austria	102.5	96.5	52.3	52.5	91	88.9	51.9	51.7
Belgium	127.7	120.9	51.3	51.5	117.7	120.3	51.8	51.4
Czech Republic	47.4	43.3	47.4	47.3	39.7	37.7	47.5	46.8
Germany	77.2	72.8	52.8	52.3	69.6	68.2	52.3	52.4
Denmark	51.5	49	46.7	46.4	47.2	47.8	47	46.6
Spain	117.3	115.8	58.2	58.4	114.5	117.3	58.2	57.3
Estonia	13.6	13.1	51.4	50.3	12.9	13.4	50.2	49
Finland	75.6	73	54.3	53.2	69.9	69.8	53	52.4
France	123.7	122.9	54.3	54	121.2	123.4	53.9	53.6
United Kingdom	119.8	117.1	64.8	64.5	113.8	117.2	64.7	64
Greece	189.2	192.7	68.2	68.7	199.2	200.7	69.2	69.3
Hungary	98.8	93.1	50.2	50.2	86.6	83.5	49.3	49.4
Ireland	85.2	76.6	33.8	31.6	74.6	68.7	30.5	29.3
Italy	154.6	152	60.1	60.3	146.8	154.5	60.2	60
Lithuania	50.9	47	63.1	62.2	40.7	44.5	61.5	60.5
Luxembourg	27.9	29.7	29.7	29.8	28.8	30	29.8	29.5
Latvia	49.7	47	60.5	60.4	45.6	47.2	59	59.5
Netherlands	77.6	70.9	44.6	44.3	66	62.2	44.1	43.5
Poland	73	68.7	58.6	58.6	66.8	63.3	58.4	57.5
Portugal	144.3	143.1	65.4	64.6	137.3	136	64.3	63.8
Slovakia	67.7	65.5	55.1	56.1	63.4	63.1	56.4	56.7
Slovenia	97.2	89	54	52.6	83	80.9	52.1	52.4
Sweden	61.9	60.1	45.9	45.7	59.2	55.9	45.7	44.9

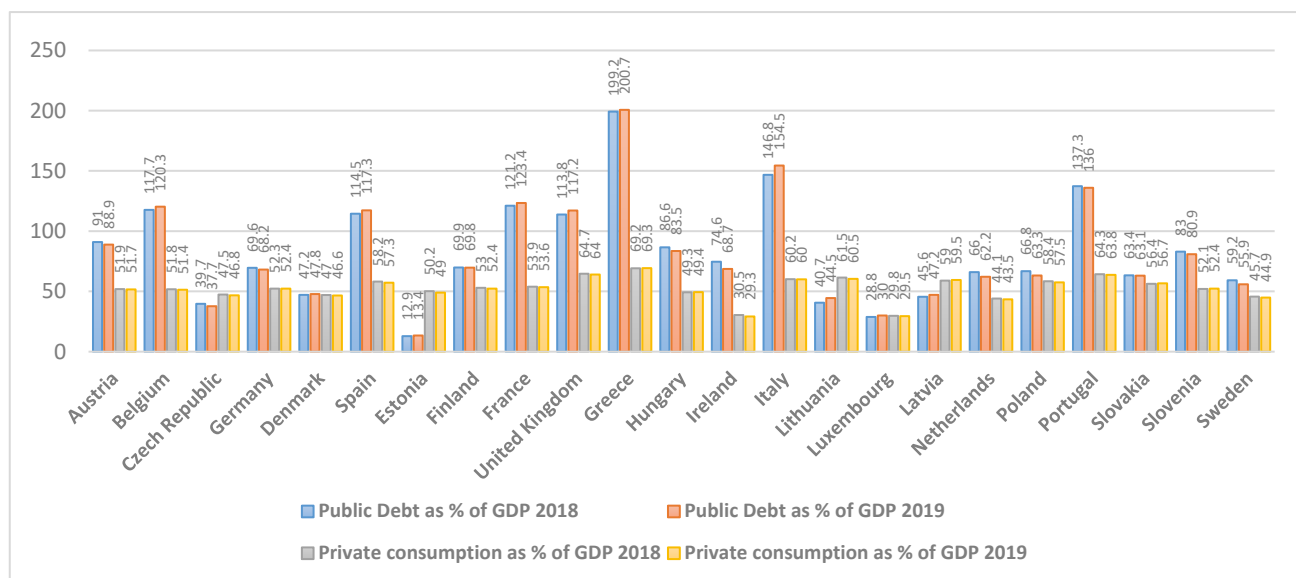
*Source: OECD and World Bank (2022).*



**Figure 1.** Analysis of the linear trend between public debt and private consumption in the GDP of European OECD countries (2016–2017). Source: OECD and World Bank (2022).

The states with the lowest level of public debt expressed as a ratio of public debt to GDP are Estonia, Luxembourg, and the Czech Republic. Estonia has an average ratio of 13.24%. The highest level of participation was in 2016 with 13.6% participation, while the lowest was in 2018 with 12.9% participation. Luxembourg ranks as the second country with the lowest level of public debt, with an average ratio of 29.07%. There was a mixed trend in the ratio movement in 2017; it increased to 29.7% compared to 2016, when the ratio was 27.9%. While in 2017, there was a decrease in the level of public debt compared to 2018. 2019 has reached the highest level of participation at 30% during this period. The Czech Republic has reduced public debt from 2016–2019. In 2016, the level of debt was 47.4% participation in GDP, while in 2019, it was reduced to 37.7%.

Table 3 present the participation of private consumption in GDP for the period 2016–2019 in the European countries that are members of the OECD. This participation is expressed in percentages. According to the statistics obtained from the annual reports of the OECD, we see that during these four years, Greece, Portugal, the United Kingdom, and Lithuania are the countries that have the highest private consumption as a share of GDP. Greece has an average share of private consumption in GDP of 68.9% over the years. From the statistics, we see that there was a trend of increasing consumption in Greece from 2016 to 2019, wherein 2019, this increase reached participation of 69.3%. In Portugal, the United Kingdom, and Lithuania, there was a decreasing private consumption trend over the years. The average share of private consumption in GDP during 2016–2019 in Portugal and the United Kingdom is 64.5%, and in Lithuania, 61.8%. Figure 2 presents an analysis of the linear trend between public debt and private consumption in the GDP of European OECD countries, focusing on the period from 2018 to 2019. This graphical representation offers insights into the relationship between public debt and private consumption over this specified timeframe.



**Figure 2.** Analysis of the linear trend between public debt and private consumption in the GDP of European OECD countries (2018–2019). Source: OECD and World Bank (2022).

These statistics show that Luxembourg, Ireland, and the Netherlands have the lowest private consumption. Private consumption in Luxembourg has an average participation of 29.7% in GDP during these four years. In 2017 and 2018, Luxembourg had an increase in consumption from 29.7% to 29.8%, but in 2019 this participation decreased to 29.5%. Ireland has had a downward trend; in 2016, the participation was 33.8%, while in 2019, it decreased to 29.3%. The Netherlands has also had a downward trend over the years. The share of private consumption in GDP decreased from 44.6% (2016) to 43.5% (2019).

Based on the trend analysis, we can see that Belgium, France, the United Kingdom, and Spain are considered countries where a high part of their GDP comprises public debt, with an average share of over 116%. Denmark, Lithuania, Latvia, and Norway have approximately the same public debt to GDP ratio. In 2019, Denmark participated with 47.8%, Lithuania with 44.5%, Latvia with 47.2%, and Norway with 46.7%. While Greece, Portugal, the United Kingdom, and Lithuania are ranked as the countries with the highest level of private consumption per GDP, on the other hand, Luxembourg and Ireland as the countries with the lowest level of private consumption per GDP.

Slovenia, Germany, Switzerland, and Austria have almost the same average percentage of private consumption in GDP. This participation is 52.7%, 52.4%, 52.2%, and 52.1%. Iceland and Hungary have average participation of 49.9% and 49.7%, respectively. In Hungary, the level of consumption has remained the same, 50.2% in 2016 and 2017; in 2018 and 2019, it decreased to 49.3% and 49.9%. Norway and the Netherlands also have almost the same average share of private consumption in GDP at 44.4% and 44.1%.

Measuring the impact of public debt on the economy of the respective countries is one of the leading indicators that serve the monetary and fiscal policymakers in terms of finding optimal policies that would result in employment, consumption, well-being, low inflation, and consequently, economic growth. In economic theory, public debt with a targeted destination and optimal level of GDP has been proven to benefit economic growth. Precisely, in this scientific paper, through this econometric analysis, an attempt has been made to measure the impact that public debt has on the

lives of ordinary citizens, namely on their private consumption. This analysis was carried out through secondary data obtained from reliable and relevant sources and included the leading macroeconomic indicators of 26 European countries and members of the OECD. This analysis aims to reflect as clearly as possible the impact of public debt on the private consumption of the respective countries in connection with other macroeconomic variables. Initially, in the econometric analysis, descriptive statistics, correlation analysis, and the results of statistical tests of panel data are presented, which will prove the validity of the main hypothesis of this study as shown in Table 4.

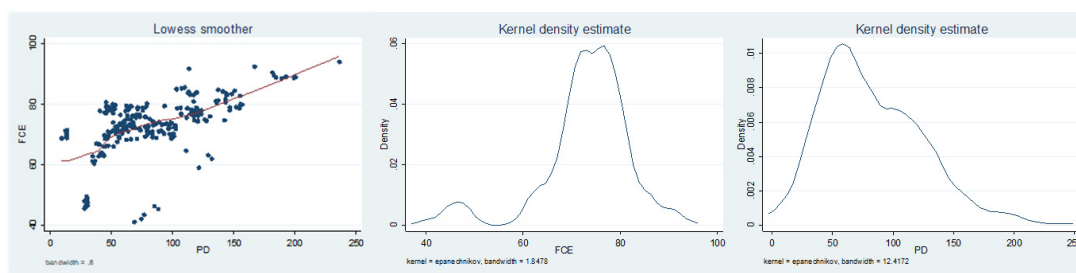
**Table 4.** Descriptive statistics for the variables included in the econometric model.

Variables	Obs.	Minimum	Maximum	Mean	Std. Deviation
FCE	260	38.7	94.10	73.02	9.33
PD	260	9.39	236.46	82.93	41.39
GFCF	260	-25.37	99.51	2.98	10.55
FDI	260	-107.74	133.99	3.86	14.91
CPI	260	-1.73	5.65	1.40	1.33
EKS	260	25.48	221.19	63.88	36.51
GDP_GROWTH	260	-9.88	35.08	3.12	4.16

*Note:* FCE – Final consumption expenditure, DP – Public debt, GFCF – Gross fixed capital formation, FDI – Foreign direct investment, CPI – Consumer price index, EGS – Export of goods and services, GDP\_GROWTH – Gross domestic product growth.

According to the results of the correlation analysis, which are reflected in the appendix section, there is a high positive relationship  $R = 76.9\%$  between private consumption and public debt. So, with the increase in the government's public debt in the long term, the private consumption of the European countries that are members of the OECD will also increase. The increase in public debt in European OECD countries will affect the increase in income, wealth, and consumption demand. Therefore, when these countries' government expenditures are smaller, the demand for consumption in equilibrium will be greater, and the public debt should be higher.

Between private consumption and the formation of gross fixed capital, there is an average positive correlation in the value of  $R = 56.2\%$ . So, with the increase in investments in fixed capital, private consumption will increase and vice versa. This positive relationship between private consumption and the formation of gross fixed capital is explained by the fact that households and businesses in these countries have beneficially allocated their income to fixed investments and, from these investments, have generated higher income. Therefore, through the increase in income, private consumption has also increased, and such a multiplier effect positively affects the economic growth of European OECD countries. Figure 3 shows the correlation between private consumption and public debt graphically. In the second part of this figure, the Kernel densities for the main variables of this study (private consumption and public debt) are graphically presented.



**Figure 3.** Graphic representation of correlation analysis and Kernel density between FCE and PD.

According to the first part of the figure, where the correlation between public debt and private consumption is graphically presented, it can be concluded that there is a high positive correlation because the points are distributed very close to the regression line. According to the graphic representation of Kernel density, we can conclude that the dependent variable (FCE) has a high probability density, and the endogenous and independent variable (PD) is likely to be close to the statistical values of private consumption. A high probability density between private consumption and public debt indicates this econometric model's robust non-parametric panel data function.

According to the results of the correlation analysis, we can conclude that there is an average positive correlation between foreign direct investment and private consumption. This result shows that foreign direct investments in European OECD countries are focused on capital as one of the leading production functions and that these investments significantly impact the economic growth of these countries. Since the European countries of the OECD are developed economies, it is worth noting that foreign direct investments in these countries have been very profitable even though these countries have provided high rates of return from the investments they have made in other countries. Therefore, a greater rate of return has positively impacted income growth from businesses and households. As a result, private consumption has increased due to the increase in welfare and the population's standard of living.

Between the private consumption variables and the consumer price index, there is an average positive correlation of  $R = 53\%$ . Such a correlation is explained by the continuous increase in the price level affecting the decrease in the purchasing power of consumers; such an effect increases the cost of living. So, an increase in inflation will also increase the amount of consumption in the family economies and businesses of the European member countries of the OECD. Whereas, between private consumption and export of goods and services, there is a high negative correlation  $R = 76.2\%$ . Such a negative correlation is consistent with the classical theory of international trade, where the increase in the export of goods and services will increase the price of the export product and reduce domestic consumption and consumer surplus.

According to the results of the correlation analysis, there is an average negative correlation of  $R = 40\%$  between the growth of the gross domestic product and private consumption. Such a negative correlation results from the fact that for the analyzed period (2011–2020), most of the European countries of the OECD have a downward trend of GDP growth. Therefore, a negative relationship results between these two variables.

On the other hand, according to the results of the multicollinearity and heteroscedasticity results in the panel econometric model that are reflected in the appendix section, we can confirm that



multicollinearity and heteroskedasticity are not present in the econometric model of this study. Because all the independent variables of this study have a variation increment factor (VIF) of less than 5, this implies a non-serious problem for the statistical robustness of the econometric model. Moreover, according to the results of the Breusch-Pagan test, all the independent variables of the econometric model have a higher significance value than the standard value of 0.05. Therefore, we can conclude that there is no heteroskedasticity in this econometric model, and the error terms distribution is constant for each observation.

To test the validity of the main hypothesis of this study, we applied eight statistical tests through the Stata program. They are linear regression, random effect, fixed effect, Hausman-Taylor Regression, GMM model (Arellano-Bond estimation, Arellano-Bover/Blundell-Bond estimation, linear DPD estimation), and the generalized estimating equations (GEE) model. Table 4 presents the econometric results of this study, which analyzed if public debt impacts private consumption in European OECD countries.

$$FCE_{it} = \beta_0 + \beta_1 PD_{it} + \beta_2 GFCF_{it} + \beta_3 FDI_{it} + \beta_4 CPI_{it} + \beta_5 EGS_{it} + \beta_6 GDP\_GROWTH_{it} + Eurozone\_Dummy + \gamma_{it} \quad (4)$$

Table 5 provides the econometric results of statistical tests conducted for the panel econometric model. This table offers a comprehensive summary of the statistical findings derived from the analysis.

**Table 5.** Econometric results of statistical tests for the panel econometric model.

Variables	Linear regression	Random effects – GLS regression	Fixed – effects regression	Hausman Taylor regression	GMM model (Arellano-Bond estimation)	GMM model (Arellano-Bover/Blundell-Bond estimation)	GMM model (linear DPD estimation)	GEE model
FCE	-	-	-	-	0.723*** (0.000)	0.856*** (0.000)	-	-
PD	0.073*** (0.000)	0.069*** (0.000)	0.072*** (0.000)	0.066*** (0.000)	0.025 (0.103)	0.015* (0.072)	0.063*** (0.000)	0.069*** (0.000)
GFCF	0.149*** (0.000)	0.052*** (0.000)	0.047*** (0.001)	0.050*** (0.000)	0.004 (0.456)	0.007*** (0.004)	0.024*** (0.003)	0.051*** (0.000)
FDI	0.028 (0.237)	0.005 (0.550)	0.004 (0.598)	0.005 (0.540)	0.006* (0.077)	0.007* (0.057)	0.005 (0.254)	0.005 (0.553)
CPI	0.977*** (0.000)	0.584*** (0.000)	0.553*** (0.000)	0.559*** (0.000)	0.198*** (0.003)	0.284*** (0.000)	0.388*** (0.000)	0.579*** (0.000)
EGS	-0.149*** (0.000)	-0.185*** (0.000)	-0.234*** (0.000)	-0.202*** (0.000)	-0.050 (0.141)	-0.023* (0.083)	-0.305*** (0.000)	-0.191** * (0.000)
GDP_GR OWTH	0.005 (0.996)	-0.125*** (0.003)	-0.110*** (0.009)	-0.122*** (0.003)	-0.316*** (0.000)	-0.353*** (0.000)	-0.037 (0.118)	-0.123** * (0.004)
Eurozone_ Dummy	0.478*** (0.001)	0.087*** (0.001)	0.451*** (0.001)	0.447*** (0.001)	0.478 (0.456)	0.500*** (0.001)	0.077*** (0.003)	0.457*** (0.001)
Const.	75.814	79.005	81.847	80.246	79.125	88.958	87.022	79.366

*Continued on next page*

Variables	Linear regression	Random effects – GLS regression	Fixed – effects regression	Hausman Taylor regression	GMM model (Arellano-Bond estimation)	GMM model (Arellano-Bover/Blundell-Bond estimation)	GMM model (linear DPD estimation)	GEE model
Observation	243	243	243	243	140	165	243	243
R square	0.711	0.706	0.699	0.723	0.741	0.698	0.627	0.714
Adj. R <sup>2</sup>	0.703	0.691	0.682	0.704	0.725	0.687	0.578	0.705
Hansen J test	-	-	-	-	-	0.210	0.234	0.318

**Clarification:** *p*-values shown in brackets: \*\*\* indicates statistical significance at the 1% level, \*\* indicates statistical significance at the 5% level, and \* indicates statistical significance at the 10% level.

**Note:** *FCE* – Final consumption expenditure, *DP* – Public debt, *GFCF* – Gross fixed capital formation, *FDI* – Foreign direct investment, *CPI* – Consumer price index, *EGS* – Export of goods and services, *GDP\_GROWTH* – Gross domestic product growth.

According to the econometric results in Table 5, most of the variables included in this econometric panel model are significant at the 1%, 5%, or 10% level. According to the Hansen J test results, if the significance value is greater than 0.05, then these results suggest that the instruments are valid and uncorrelated with the error term. This is a favorable result, indicating that the instruments used in the GMM model effectively address the issue of endogeneity. Our analysis will be based on the GMM model (Arellano-Bover/Blundell -Bond Estimation) for interpretation purposes.

$$FCE_{it} = 88.958 + 0.015PD_{it} + 0.007GFCF_{it} + 0.007FDI_{it} + 0.284CPI_{it} + 0.023EGS_{it} - 0.353GDP_{GROWTH_{it}} + 0.500Eurozone\_Dummy + 0.302 \quad (5)$$

The variable *Eurozone\_Dummy* in this econometric model is a dummy variable that represents the presence or absence of countries in the Eurozone with restrictions on expansionary policies. This type of variable is often used to capture specific changes related to the characteristics of certain Eurozone countries. Thus, in this context, *Eurozone\_Dummy* can take the value 1 for countries that are members of the Eurozone and have experienced restrictions on expansionary policies, while it takes the value 0 for countries that do not have these restrictions. The GMM model using the Arellano-Bover/Blundell-Bond estimation method shows that private consumption goes up by 0.5 units when the *Eurozone\_Dummy* variable is set to 1, which means that countries in the Eurozone with restrictions on expansionary policies are different from countries that don't have these restrictions. The significance level is  $0.001 < 0.05$ , suggesting that this change in private consumption is statistically significant and indicates a true difference in the growth of private consumption for this group of countries.

The difference in the growth of private consumption from public debt in Eurozone countries with restrictions on expansionary policies compared to other countries can be explained by differences in the economic, political, and institutional context between these two groups of countries. To illustrate this difference, let's consider a comparative analysis between two specific countries: Greece, a Eurozone country that has experienced strong restrictions on expansionary policies, and Germany, a Eurozone country that has adopted a more conservative approach in the field of debt and

expansionary policies. Greece has undergone a long period of strong restrictions on expansionary policies imposed by international institutions and the Eurozone to address the financial crisis. These restrictions included reducing public spending, increasing taxes, and other structural reforms. In this context, the increase in public debt may have served as an essential tool to finance necessary expenditures and support private consumption. In this case, public debt has experienced a noticeable increase and has assisted in stimulating private consumption to improve the economy. Germany has adopted a more conservative approach in the field of debt and expansionary policies compared to some other Eurozone countries during the post-crisis period. Its policies have focused on sustainable economic growth and reducing public debt. In this case, the increase in public debt may be more moderate and have a smaller impact on the growth of private consumption. Germany may have preferred other investments, such as infrastructure and innovation, to stimulate economic growth. The content of restrictions on expansionary policies and the approach to debt management affect how the increase in public debt will impact private consumption differently. In this way, variations in their policies and particular economic circumstances can explain differences between Eurozone countries with stricter policies and those with a more moderate approach.

Based on the analysis of examples from Greece and Germany, differences in the impact of public debt on private consumption for these two groups of countries in the Eurozone can be observed. These differences may result from variations in economic and financial policies, as well as the restrictions on expansionary policies that have influenced the use of public debt for economic stimulation. The content of expansionary policies and the approach to public debt have announced significant changes in how these two groups of countries treat the relationship between public debt and private consumption. The increase in public debt has served as a more powerful instrument to stimulate private consumption in countries with stricter policies, while in countries with a more moderate approach, the impact is more moderate and oriented towards other investments.

What effect does public debt have on private consumption in European countries that are members of the OECD? Public debt, as the primary analyzed variable, turns out to have a positive impact on the private consumption of these countries. Therefore, with the increase of the public debt by 1 unit, keeping other factors constant, private consumption will increase by 0.015 units, which is justified by the significance level of 0.072, within the allowed limit of 0.10. Here it can be concluded that these countries have used public debt efficiently in financing the budget deficit used for targeted investment projects, increasing the employment and well-being of their citizens, which has influenced them to provide more income, stimulating an increase in consumption. Also, from the current economic theory, it is known that the state, through investments, increases the supply of money in the market, increases economic activity and encourages employment. In contrast, it is known that employment increases citizens' income, and in this way, consumption is also stimulated.

The gross fixed capital formation in this econometric analysis is also within the accepted significance level. Moreover, it appears to have a positive impact on private consumption. With a unit increase in the formation of gross fixed capital while keeping other variables unchanged, private consumption increases by 0.007 units. It can be explained by the fact that the excess money after the regular consumption of households and businesses is destined for investment in fixed assets. Therefore, the investment in these assets has influenced the growth of income and the growth of private consumption, causing a multiplier effect on the economic growth of European countries that are members of the OECD.

Foreign direct investments in this study are statistically significant and positively affect private consumption in European OECD countries. So, with an increase of 1 unit in foreign direct investments, keeping other factors constant, private consumption will increase by 0.007 units. This statement is correct because the significance level is within the statistical significance level ( $P\text{-value} = 0.057 < 0.10$ ). The effect of foreign direct investments on private consumption is indirect because the European countries that are members of the OECD in recent years have realized foreign direct investments in high inflows and outflows. Therefore, they have contributed positively to the economic growth of these countries, especially in the production sector, information technology, and various industries. A stable economic growth resulting from profitable foreign direct investments has also positively influenced the growth of private consumption because family economies and businesses have increased income, employment, and living standards during the analyzed period (2011–2020).

The consumer price index is one of the main indicators that prompt people to buy or save. According to economic theory, based on the law of supply and demand, people are inclined to buy when offered a lower price. However, in the results obtained, the price index has a direct relationship with the increase in the level of consumption. That is, with the increase in the price index by 1-unit, private consumption increases by 0.284 units. It is explained by the fact that if the price level increases, then the consumer's basket becomes more expensive, and the impact of this variable is not on the quantity consumed but only on the price paid for the same basket along with the inflation rate.

The export of goods and services based on this econometric analysis is inversely related to private consumption. With one unit of export increase, private consumption would decrease by  $-0.023$  units. Given the fact that the analyzed countries have developed economies and use progressive economic policies, it happens that these countries stimulate export in order to strengthen their currency and weaken the currency of the importing country. This approach affects consumption, especially in the trade between neighboring countries, since with the weakening of the neighboring country's currency, consumers are inclined to be supplied with goods in the neighboring country, which would harm domestic consumption.

GDP growth has a negative impact on the level of private consumption. However, from economic theory, this variable is known to have a direct relationship with consumption, so GDP growth also affects private consumption growth and vice versa. However, if the GDP growth data is analyzed for the ten years, it can be observed that the GDP growth percentage has gone down yearly. Because in some periods, there has been a negative rate of growth/decrease that has influenced the consumption to take negative values of increase/decrease, which is proven through the economic theory for the proper correlation between these two variables.

The results of this paper shed light on the economic channels that connect various factors to private consumption in European OECD countries. Table 6 provides a concise description of the economic channels underlying the econometric results presented in the manuscript. It offers insights into the mechanisms through which public debt influences private consumption in European OECD countries from 2011 to 2020.

**Table 6.** Description of the economics of the channels for the econometric results.

Economic phenomenon	Empirical results	Discussion of economic of channels
Positive impact of public debt on private consumption	Public debt, when increased by 1 unit, leads to a 0.015 unit rise in private consumption	Efficient use of public debt in financing budget deficits for targeted projects positively influences employment, well-being, and income growth. State investments, stimulated by public debt, contribute to increased money supply, economic activity, and employment, thereby stimulating private consumption.
Gross fixed capital formation and its impact on private consumption	A unit increase in gross fixed capital formation corresponds to a 0.007 unit rise in private consumption.	Excess money, redirected to investment in fixed assets, contributes to income growth and private consumption. Investment in fixed assets creates a multiplier effect on economic growth in European OECD countries.
Foreign direct investments (FDI) and their role	Statistically significant FDIs positively affect private consumption. A 1-unit increase in FDIs leads to a 0.007 unit rise in private consumption.	FDIs contribute to economic growth, especially in production, information technology, and various industries. Stable economic growth from profitable FDIs positively influences income, employment, and living standards, fostering private consumption.
Consumer price index (CPI) and its unusual impact	A 1-unit increase in the CPI results in a 0.284 unit rise in private consumption.	Higher prices, instead of reducing consumption, lead to an increase, indicating unique market dynamics.
Inverted relationship between export and private consumption	A 1-unit increase in exports corresponds to a -0.023 unit decrease in private consumption.	Progressive economic policies stimulating exports affect consumption patterns, especially in neighboring countries.
Negative impact of GDP growth on private consumption	Despite the expected positive correlation between GDP growth and consumption, a negative impact is observed.	Fluctuations in GDP growth percentages over ten years contribute to variations in private consumption.

In summary, the economic channels outlined in this study emphasize the interconnectedness of various factors with private consumption, providing valuable insights for policymakers and economists in understanding and managing economic dynamics in European OECD countries.

## 5. Discussion

The empirical results of this study show a high positive correlation between public debt and private consumption in European countries that are members of the OECD. Through this study, it has been proven empirically that public debt positively impacts private consumption in these European countries during the period 2011–2020. Therefore, this study supports the general economic theory that agrees with the opinion that the increase in the level of public debt will affect the level of private consumption expenditures of the states. The empirical findings from this study support this theory, where according to the results obtained from the econometric analysis, we see that with the increase of the public debt by 1 unit, we have an increase in the level of private consumption by 0.015 units.

According to the econometric results of this study, there is a positive correlation between the formation of gross fixed capital, foreign direct investments and the consumer price index with private consumption. In comparison, there is a negative correlation between export variables and GDP growth with private consumption. This study's econometric results have met the expected results to a large extent. They have statistically supported the validity of this study's main hypothesis, which consists of the fact that public debt has positively influenced the private consumption of European countries that are members of the OECD. The results of this study are similar and support the empirical findings of the study by authors Kusairi et al. (2019) that confirm that public debt has a positive impact on the growth of private consumption in Asia Pacific countries. In comparison, the econometric results of this study contradict the claims of the authors Berben and Brosens (2007) and Morina and Berisha (2021) that public debt has a negative or insignificant impact on private consumption in different countries of the world.

The results obtained from this study are not consistent with the theory of Ricardian equivalence. On the contrary, they emphasize that public debt has no impact on the level of private consumption and that governments should not focus on efforts to stimulate a country's economy through increased government-financed spending from the debt. Consequently, according to this theory, this government policy will not be effective because investors and consumers understand that the debt will eventually have to be repaid by taxes. However, the results of this study give us new empirical evidence and scientific arguments that the proper management and allocation of public debt in profitable and worthwhile investment projects will positively affect the growth of private consumption and the economic development of the European countries that are members of the OECD.

Moving into a broader theoretical context, the various discussions delve into institutional theory, emphasizing the conventional focus on the creation and convergence of institutions. However, studies by different authors argue for equal consideration of deinstitutionalization, emphasizing the processes that lead to the weakening and disappearance of institutions. This perspective places deinstitutionalization within the broader landscape of institutional change, recognizing that the erosion of existing beliefs often paves the way for the emergence of new beliefs.

In addition, various studies align with contemporary research in institutional theory by exploring transnational processes and conducting field-level investigations involving multiple organizations. A prominent aspect of inquiry involves the moral dimension of institutions, their change, and the complex interplay between institutions and the individual self and character. Many scholars argue that institutional change is complex, linked to the critical interplay between institutions and individual responsibility, demanding accountability.

In conclusion, the empirical evidence of the study challenges the prevailing economic theories regarding public debt and private consumption. At the same time, it contributes to the broader discourse on institutional theory, encouraging institutional scholars to explore interdisciplinary perspectives that foster progress, improve human interactions, influence social behavior, and contribute to societal development pathways. The interdisciplinary approach adopted by this study aims to navigate uncharted territory within and beyond the field of institutional theory, aiming for a nuanced understanding of the complex dynamics at play.

**Table 7.** Summary of the econometric results of the study.

Variables	Coefficient	Significance level
Public debt	Positive	Significant
Gross fixed capital formation	Positive	Significant
Foreign direct investments	Positive	Significant
Consumer price index	Positive	Significant
Export	Negative	Significant
GDP growth	Negative	Significant
Eurozone_Dummy	Positive	Significant

According to Table 7, public debt has a positive impact on private consumption, implying efficient use in financing projects that stimulate economic activity and employment. Gross fixed capital formation positively influences private consumption, suggesting a multiplier effect on economic growth. Foreign direct investments contribute positively to private consumption, indicating a stable economic growth influence. The consumer price index has a direct relationship with increased consumption, despite economic theory's expectations. Exports have an inverse relationship with private consumption, influenced by currency dynamics. GDP growth negatively affects private consumption, with a decreasing trend observed over the past ten years.

This study's emphasis on the positive impact of public debt on consumption distinguishes it from some literature that might highlight potential drawbacks. The nuanced view of the relationship between exports and private consumption adds depth to the understanding of the economic dynamics involved. The study's recognition of the indirect impact of foreign direct investments on consumption aligns with some contemporary economic theories.

Institutional changes should focus on implementing strategic fiscal policies that ensure the responsible and effective use of public funds. This involves establishing clear guidelines on how public debt is incurred, allocated, and monitored to prevent misuse or excessive accumulation.

**Institutional change:** The effectiveness of public debt in stimulating private consumption calls for strategic institutional changes. Implementing responsible fiscal policies, including clear guidelines for debt management and transparency mechanisms, is paramount. Establishing robust frameworks for debt sustainability assessments, debt ceilings, and independent audits ensures fiscal responsibility. Additionally, fostering international cooperation and exploring innovative revenue-generation methods contribute to reducing reliance on domestic debt.

**Long-term effects of high public debts:** Understanding the long-term implications of high public debts is essential, especially in crisis management and economic growth. Assessing the utilization of debt for productive investments in infrastructure and social sectors provides insights into economic resilience. Analyzing the effectiveness of countercyclical fiscal policies during economic downturns is crucial. The response to the COVID-19 pandemic serves as a pertinent case study, highlighting the role of public debt in crisis management, healthcare, and economic stimulus. Examining the COVID-19 response reveals the intersection of high public debt and crisis management. Countries with elevated debts utilized fiscal stimulus measures to support businesses and prevent unemployment. The correlation between healthcare spending, debt levels, and healthcare system resilience is noteworthy. Challenges in ensuring debt sustainability post-COVID underscore the need for global cooperation and debt relief initiatives.

The synthesis of results and discussions underscores the importance of institutional changes in optimizing the positive effects of public debt. Long-term considerations emphasize the role of debt in fostering economic growth and resilience. The COVID-19 example illustrates the nuanced relationship between high public debts and crisis response. These insights contribute to a comprehensive understanding of public debt dynamics and provide avenues for future research and policy development. Table 8 shows the pros and cons of high public debt for European OECD countries.

**Table 8.** Summary of the advantages and disadvantages of high public debt.

Pros	Cons
Financing targeted projects.	Increased fragility in crisis management
Stimulating economic activity and employment	Potential reduction in economic growth
Positive effects on living standards	Long-term risks to economic stability

Table 8 outlines the advantages (pros) and disadvantages (cons) associated with high levels of public debt. Public debt can be effectively utilized to finance specific projects, such as infrastructure development, education, or healthcare, providing a boost to targeted sectors of the economy. High public debt can contribute to economic stimulation by financing projects that create jobs and enhance overall economic activity. Public debt, when used efficiently, has the potential to improve living standards by investing in essential public services and amenities, leading to enhanced well-being for citizens. High levels of public debt may render a country more vulnerable during economic crises, limiting the fiscal space available for crisis management measures. Excessive public debt could impede economic growth by diverting resources towards debt servicing rather than productive investments, potentially hindering overall economic development. Sustainedly high public debt levels pose long-term risks to economic stability, potentially leading to financial imbalances and challenges in maintaining fiscal discipline. This table provides a concise overview of the positive and negative aspects associated with elevated public debt levels, offering a balanced perspective on the implications for an economy.

**Table 9.** SWOT matrix of high public debt.

<i>SWOT (Strengths, Weaknesses, Opportunities, Threats) matrix</i>	
<b>Strengths</b>	<b>Weaknesses</b>
Efficient use of public debt	High fragility in crisis situations
Positive impact on consumption	Long-term risks to economic growth
<b>Opportunities</b>	<b>Threats</b>
Potential for institutional changes to manage debt better	Increasing vulnerability to economic shocks

The SWOT matrix shown in table 9 provides a comprehensive analysis of the implications of high public debts, examining both internal and external factors.

1. **Strengths:** The efficient use of public debt is acknowledged, emphasizing its positive impact when allocated to strategic initiatives. Additionally, there's recognition that high public debt can have a positive effect on consumption, boosting economic activity and living standards.

2. **Weaknesses:** This section highlights the susceptibility of economies with high public debt to increased vulnerability during crisis situations, limiting the flexibility for effective crisis management.



It also recognizes that persistently high public debt levels may pose long-term risks, potentially hindering economic growth due to the burden of debt service.

3. Opportunities: The analysis identifies an opportunity for improvement through potential institutional changes. This suggests that enhancing governance structures could mitigate associated risks and contribute to better public debt management.

4. Threats: recognizing the threat posed by rising public debt levels, particularly in terms of increasing vulnerability to economic shocks such as financial crises or external economic downturns. This section underscores the importance of addressing potential threats to maintain economic stability.

In summary, the SWOT matrix offers a holistic view of the various factors associated with high public debts, providing insights into the strengths and weaknesses of current approaches, potential opportunities for improvement, and the external threats that need to be considered for effective economic management.

## 6. Conclusions

In conclusion, this study employs various statistical techniques, including econometric panel models, to examine the correlation and impact of public debt on private consumption in 26 European OECD countries. Our empirical findings reveal a positive association between public debt and private consumption, particularly evident in economically developed states facing persistent budget deficits due to challenges in covering expenses adequately.

However, it is imperative to recognize and address the limitations inherent in our study. The robustness of our conclusions relies on the chosen statistical methods and may be influenced by specific contextual factors. A more nuanced understanding of the implications of public debt on private consumption can be achieved by acknowledging these limitations.

Our study posits that public debt can serve as a valuable tool not only for addressing budget deficits but also for fostering economic development and growth. The key lies in the strategic allocation of public debt revenues towards projects that enhance citizens' incomes and generate sustainable, long-term economic returns.

Furthermore, the study underscores the significance of instituting appropriate changes to manage public debt for economic growth. Policymakers should carefully consider the implications of debt accumulation on long-term economic stability and implement measures that promote fiscal resilience. Striking a balance between immediate fiscal concerns and ensuring that public debt is directed towards initiatives contributing to overall economic well-being is crucial.

In light of these considerations, our findings contribute significantly to the ongoing discourse on macroeconomic and fiscal policies. However, it is essential to delve deeper into the limitations of our study and consider these in the context of future developments. Future research should address the identified limitations by exploring alternative statistical methods and accounting for additional contextual factors, providing a more comprehensive understanding of the relationship between public debt and private consumption.

This study serves as a valuable model for shaping policies, not only in the examined European OECD countries but also for nations in transition. It offers insights into the potential impacts and implications of public debt management, emphasizing the need for careful consideration of limitations and the implementation of strategic policy changes. By doing so,

nations can enhance their ability to manage public debt effectively, fostering sustainable economic growth and resilience against emerging shocks.

### Use of AI tools declaration

The authors affirm that no artificial intelligence (AI) tools were used in the creation of this work.

### Conflict of interest

The authors declare no conflicts of interest in this paper.

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