Fiscal policy, corruption and economic growth: Evidence from Southern European countries

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ABSTRACT

This study investigates the effects of fiscal policy and corruption on economic growth using panel data analysis. Three panel regression techniques were applied: fixed effects, random effects, and pooled OLS. After evaluating the model performance, the Random Effects model and the Pooled OLS model were selected as the most appropriate for the analysis. The research focuses on four Southern European countries, Spain, Italy, Greece, and Portugal, covering the period from 1995 to 2019. GDP growth was used as the dependent variable, serving as a measure of economic performance. The independent variables included the Corruption Perception Index (CPI) to represent corruption, along with government spending and tax revenue to capture fiscal policy. To examine whether corruption influences the effectiveness of fiscal policy, the model also included interaction terms between CPI and the two fiscal variables. The results showed that a one-unit increase in government spending was associated with a 0.24% decrease in GDP growth, while a one-unit rise in tax revenue corresponded to a 0.26% decline. Conversely, a one-point increase in the CPI score, indicating reduced corruption, was linked to a 0.09% increase in economic growth. These findings were statistically significant. However, the interaction terms between corruption and fiscal policy were not significant, suggesting that corruption did not significantly modify the impact of fiscal measures on economic growth within this sample.

> **Highlights of this paper**
> - The objective of this research is to examine whether corruption and fiscal policy affect economic growth and whether corruption can affect the relationship between economic growth and fiscal policy.
> - The findings demonstrate that corruption and fiscal policy (tax revenue and government spending) can negatively affect economic growth.
> - Corruption is found to not affect the relationship between economic growth and fiscal policy.

1. INTRODUCTION

This research will examine how corruption and fiscal policy can impact economic growth. This topic is important because of the importance of economic growth. Economic growth is considered as a pivotal indicator for the prosperity of the economy and society. When an economy experiences economic growth, this entails wealth and income creation, because it increases employment, which offers people the opportunity to earn income. The income earned by people then can be spent or be invested in the economy, causing a multiplier effect that stimulates growth and reduces poverty. Therefore, economic growth is an important concept for the economy and society.

This study utilizes a different approach for the understanding of economic growth, by including political factors or variables and traditional economic variables. Specifically, economic growth is the economic variable for this research and corruption is the political variable. By combining political and economic factors, this will contribute to drawing more reliable conclusions. Thus, a more comprehensive analysis requires an analysis of both economic aspects and political aspects.

The analysis is not random that utilizes fiscal policy and corruption as factors that influence economic growth. This is based on academic literature that found evidence for the influence of these two factors on economic growth (Al-Masaeed & Tsaregorodtsev, 2018; Sriyalatha, 2019). In general, corruption is an important concept because it can play a crucial role in prosperity and well-being (Rothstein & Varraich, 2017). Certain studies found that countries with low corruption tend to have higher levels of economic growth (Gründler & Potrafke, 2019) and higher levels of human development (Stryzhak, 2025). Moreover, fiscal policy plays an important role in stimulating economic growth. Some researchers consider fiscal policy as an effective tool for the enchantment of economic growth. This approach is based to a degree on Keynesian theory, which supports that government spending, and tax policy can boost the economy, during periods of economic crisis and recession (Sadeh, Radu, Feniser, & Borşa, 2020).

This research seeks to examine if fiscal policy and corruption can have an impact on economic growth. If the analysis will show that indeed these factors can influence economic growth, the study will attempt to find if this influence is positive or negative. After that stage, it will follow the quantification of this impact via the method of panel regression.

This study examines four countries from Southern Europe: Portugal, Italy, Greece, and Spain. These nations were intentionally selected due to their shared regional and cultural characteristics, though they are not identical. Their similarities also extend to economic patterns and, in some cases, political developments. For instance, in the aftermath of the global financial crisis, Portugal, Greece, and Spain each adopted economic adjustment measures, though their reasons for doing so varied. Moreover, all three joined the European Union during the 1980s and transitioned away from authoritarian rule in the 1970s.

While Italy may differ in some respects, it still shares key commonalities with the others. The 2008 financial crisis had a major impact on the Italian economy, causing a GDP contraction of 11.3% between 2008 and 2010, based on World Bank (2024). In response, Italy introduced austerity policies in 2012–2013 to prevent a debt crisis.

Similar to Greece, Italy also maintains a high public debt level; in fact, in 2015, it recorded the second-highest debt-to-GDP ratio in the Eurozone, following Greece (Eurostat, 2025). Given these overlapping experiences and economic challenges, studying these four countries together offers valuable insights.

2. LITERATURE REVIEW

This part of the study examines existing research relevant to the topic. The review is organized into two main areas: the first explores how corruption influences economic growth, while the second investigates the role of fiscal policy in shaping economic performance.

2.1. Literature Review: Economic Growth and Corruption

Mo (2001) investigated how corruption impacts economic development, using Ordinary Least Squares (OLS) regression for the analysis. The study found that a 1% rise in corruption is associated with a 0.72% drop in economic growth. Additionally, an increase of one point in the corruption index corresponded to a 0.54% decline in growth. The research also explored the mechanisms through which corruption influences the economy, revealing that it tends to affect certain areas first, which then contribute to broader economic consequences. Notably, 53% of corruption's negative impact on growth was linked to its role in fostering political instability. The study further concluded that corruption undermines human capital and discourages private sector investment.

Nwankwo (2014) attempted to analyze if corruption can influence economic growth in Nigeria. The research applied methods of regression and Granger causality test. As for the variables, Gross Domestic Product (GDP) used as a proxy for economic growth and Corruption Perception Index as a proxy for corruption. The findings, indicated a negative relationship between corruption and economic growth. According to these results, the attempts for the increase of economic growth should be accompanied by attempts for the decrease of corruption. It is emphasized also that the policies of government should prioritize on implementing measures against corruption. These measures can focus on the improvement of institutions.

Ertimi, Dowa, Albisht, and Oqab (2016) conducted research that examined if corruption could affect economic growth, by using a sample of countries that are members of the Organisation of Islamic Cooperation (OIC). They used a sample of 14 countries from 2003 to 2010. They utilized the method of regression and constructed econometric models that are based on the endogenous growth theory. In their analysis they also employed the Economic Freedom Index. The results indicated that corruption can negatively affect economic growth.

Egunjobi (2013) examined how corruption can affect economic growth in Nigeria, using data from 1980 until 2009. This study, utilized predominantly regression analysis, causality test and the method of impulse response function. The findings showed that corruption can have direct impact on harming economic growth. Moreover, an indirect impact of corruption is that it can discourage foreign direct investments (FDI) and reduce government spending in sectors such as education. The causality test, indicated that productivity of the workers can cause corruption, but corruption cannot cause productivity of the workers. By these results, the researcher suggests, that Nigeria should prioritize enhancement of institutions responsible for combating corruption. This will contribute to tackling the phenomenon of corruption more effectively.

Simovic (2021) analyzed the relationship between economic growth and corruption for the countries of Southeastern Europe, focusing on Serbia, Montenegro and Bosnia-Herzegovina. This research has certain similarities in methodology with the present study. A similarity is that they employ the Corruption Perception Index as a proxy for corruption and GDP per capita as a proxy for economic growth as in the present study. They

utilize time series data from 2003 to 2018 and apply regression techniques. Their study finds that corruption can indeed play a negative role on economic growth.

Erum and Hussain (2019) assessed how corruption and natural resources can affect economic growth for countries that are members of the Organization of Islamic Cooperation (OIC). Their analysis, utilized panel data from 44 countries, for the period 1984 to 2016. These 44 countries they categorized into two groups depending on their Information and Communications Technology (ICT) levels. There was one group for countries with low ICT and one group for countries with high ICT. In order to be able to examine this relationship, they employed the method of cross-sectional autoregressive distributed lag model. Their findings indicated that corruption can have a harmful effect on economic growth. Conversely, their results showed that natural resources can contribute positively to economic growth. Moreover, they found that in countries with low ICT, natural resources can have a negative impact on economic growth, while for countries with high levels of ICT, the relationship was indicated to be positive. A final finding was that ICT can influence the nexus between corruption and economic growth.

In their research, Sharma and Mitra (2019) analyzed the topic of corruption and economic growth by investigating specifically how control of corruption and quality of regulation can influence economic growth. Their sample included countries between 1996 and 2015. They employed panel models and found that control of corruption and quality of regulation can contribute positively to economic growth. Therefore, their study validated a hypothesis which is called "sand the wheels" especially for countries that fall under the category of lower and lower-middle income levels. This hypothesis states that corruption can impede economic growth. Nevertheless, in contrast to what was theoretically expected, the interaction of control of corruption with quality of regulation was not found to be statistically significant in affecting economic growth.

Sbaouelgi (2019) undertook a separate analysis about the influence of corruption on both investments and economic growth. The sample included countries that are part of Middle East and North Africa (MENA), utilizing data from 1990 to 2017. In order for the author to test his hypothesis, he employed panel data regression. The findings indicated that functional public institutions contribute positively to enhancing economic growth and private or public investments. Specifically, the results of the model demonstrated that corruption can reduce economic growth by affecting negatively investment.

In 2019, Sriyalatha (2019) explored how corruption affects economic growth, concentrating on four South Asian nations: Pakistan, India, Sri Lanka, and Bangladesh. The study utilized macroeconomic panel data from 2002 to 2016, incorporating four independent variables into the analysis. Unlike many previous studies, Sriyalatha employed the Phillips and Hansen Fully Modified Ordinary Least Squares (FMOLS) technique to examine both the direct and indirect effects of corruption on economic performance. The findings revealed that corruption has a detrimental impact on growth, with a one-unit increase in corruption leading to a 0.028% decline in economic growth. In contrast, factors like human and physical capital were found to have a positive influence on growth. The author emphasized that these outcomes carry significant policy relevance, recommending that governments create specialized bodies to investigate corrupt behavior. Additionally, the introduction of ethics education in schools was proposed as a long-term strategy to instill anti-corruption values among younger generations.

Overall, the research discussed in the literature review consistently points to a harmful effect of corruption on economic performance. This pattern of findings leads us to expect comparable outcomes when analyzing and evaluating the relationship between corruption and economic growth in our own study.

2.2. Literature Review: Economic Growth and Fiscal Policy

Ugwuanyi and Ugwunta (2017) investigated if fiscal policy can function as a mechanism that can encourage economic growth. Their dataset contained economies of the Sub-Saharan Africa region. The method that they applied for the purpose of answering their research questions was panel regression. Notably, the fixed effect model indicated that government spending, even when it is productive or non-productive, can play a negative role in economic growth. While taxation that is categorized as distortionary and taxation that is classified as non-distortionary can increase economic growth. As for their last fiscal variable, which was budget surplus, they revealed that the sign was positive on the panel model, but it was found to be not significant.

Another study of Maheswaranathan and Jeewanthi (2021) sought to examine how fiscal policy shapes economic growth. The country that used in the sample, was Sri Lanka with data ranging from the period of 1990 to the period of 2019. They employed the method of autoregressive distributed lag (ARDL). The study revealed that in the short term as well as in the long term, fiscal policy can be an important driver of Sri Lanka's economic growth. However, the results are different compared to the short term and the long term. In the short term, government spending demonstrates a positive impact on economic growth, while in the long term, government expenditure appears to be a negative contributor to economic growth.

Another study came from Hassaine and Sahed (2021), who analyzed the topic of fiscal policy and economic growth. The research concerned the country of Algeria, where they employed data covering the years 1980 to 2018. The results demonstrated that both in the long term and in the short term, government spending can act positively on economic growth. As for other fiscal variables, the results differ for what was revealed for the short run and the long run. In particular, direct taxes indicated a positive sign in the short run while in the long run direct taxes demonstrated a negative impact on economic growth. Concerning indirect taxes, in the short run, they seem to play a negative and significant role in economic growth, while in the long run, even if the influence is negative, it is not significant. Lastly, government budget balance seems to contribute positively to the dependent variable but in the long run, this contribution tends to be negative.

Another study was conducted by Pasichnyi (2017). This study addressed the topic of fiscal policy and its contribution to economic growth. Their sample included countries that belonged to four different categories, using data for the years 2001-2015. The first category was from the Group of 7 (G7), the second category contained Central European nations and nations from the Baltic region. The third category consisted of countries that were members of the Customs Union of the Eurasian Economic Union, and the fourth category represented countries that experienced the economic crisis and needed to implement financial assistance programs in the Eurozone, including Greece, Portugal, Spain and Ireland. The technique applied was predominantly regression analysis, which showed that government expenditure could contribute negatively to most categories of countries.

Asteriou, Spanos, and Trachanas (2024) analyzed the relationship between economic growth and financial development. In this research it was used as a factor that affects this nexus, fiscal policy. In order for this analysis to be conducted, data from European Union (EU) member nations were used. Concerning the technique employed, it was the Generalized Method of Moments (GMM) and the technique of Panel Threshold Regression. The results revealed that government debt can be a negative contributor to economic growth. The same negative influence was found to exist on economic growth for tax revenue and government expenditure. However, the fiscal policy variable of the budget deficit, in some models was shown to be negative and in some other models positive.

Another study by Madni and Chaudhary (2017) examined the topic of fiscal policy and economic growth for the nation of Pakistan for the timeframe of 1984 to 1985. This paper utilized the method of Autoregressive Distributed Lag (ARDL) which showed that both for the short run and the long run, government spending can act positively on

enhancing economic growth. However, in the short run this relationship was found to be weaker compared to the long run.

Tilahun Mengistu (2022) examines how fiscal policy can affect economic growth. This study focuses on the nation of Ethiopia over the span of 1985 to 2019. The researcher employed the method of Autoregressive Distributed Lag (ARDL). By this method, it arises that both non-tax revenue and revenue derived from direct taxes do not affect economic growth. Conversely, government investment is positively associated with economic growth. The same applies to productive consumption expenditure, where it was revealed that it can enhance economic growth.

Nursini (2017) conducted a study about how fiscal policy and openness of trade can affect economic growth. The country selected, was Indonesia where they used data that ranged from 1990 to 2015. The method that was used was time series regression. It should be noted before the reference of the results, that in this paper, government expenditure is not presented as a single variable, but it is divided into three components: government spending on education and health care, government operational spending and government spending on infrastructure. Moreover, another thing that should be highlighted is that the results are divided into three categories: one category for a model that is assumed that government spending is funded by external debt, another category for government spending that it is assumed that is funded by taxation and a final category that government spending it is not taken into account how is funded. Therefore, concerning the variable of government spending on health and education, it was found not statistically significant for the two of the three models but when it is supposed that government spending is funded by taxation, the impact is positive and significant for economic growth. As for government spending on infrastructure in most models is positive and significant contributor to economic growth. Related to operational spending, it was revealed as non-statistically significant for most models. Finally, for taxation the results indicate that it has positive influence on economic growth by contrast with external debt was found to have a negative influence on the dependent variable.

In a separate study, Dkhissi (2024) aimed to explore the relationship between fiscal policy and economic growth, by conducting a case study for Morocco. The data utilized for this study concerns the years of 1960 until the period of 2022. Regarding the methodology used for this investigation, the author employed threshold regression. The study finds that the nexus between economic growth and fiscal policy is non-linear and therefore the relationship is not stable. The linkage depends on the state of public finances. Specifically, when in public finance the fiscal deficit is less than 7.8% of GDP and public debt is less than 70.9% of GDP, austerity can harm economic growth and cause recession. Conversely, when the fiscal deficit and public debt are more than the previous threshold, austerity can function positively on enhancing economic growth.

Kalbiyev and Seyfullali (2024) conducted research about the country of Azerbaijan, examining the topic of fiscal policy and economic growth. The data they used, covered the period from 2005 to 2023 with quarterly data. As for their methodology they utilized the autoregressive distributed lag (ARDL) to find how fiscal policy can affect economic growth in Azerbaijan. The results indicated that government expenditure can play a positive role in economic growth. As for tax revenue, the results showed no statistically significant relationship with economic growth.

3. METHODOLOGY

In this section it will be analyzed the methodology of the current research. Beginning with the null hypotheses tested in this study, they are as follows.

"H_{01}: There is no relationship between fiscal policy and economic growth.

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H$_{02}$: There is no relationship between corruption and economic growth".

While the alternative hypotheses proposed in this research are.

"H$_{11}$: There is a significant and positive relationship between fiscal policy and economic growth.

H$_{12}$: There is a negative and significant relationship between corruption and economic growth".

These hypotheses play a central role in the study, as they help tackle the core research question: *"How significantly do fiscal policy and corruption influence economic growth?"*. The wording of this question, particularly the use of *"how significantly"*, highlights the need for a measurable analysis. Therefore, an econometric model will be applied to quantify the effects of these variables using numerical coefficients.

Regarding the sample of this research, the countries chosen to be included in this analysis, they were Greece, Portugal, Italy and Spain. The study utilizing panel data that covered the period from 1995 until 2019, retrieved from reliable sources such as the World Bank, the International Monetary Fund (IMF) and the Transparency International.

With respect to the technique to be used, to quantify the relationship and answer to hypotheses and research questions, it is chosen the panel regression by using varied types of models. Specifically they will be employed the fixed effects model, the random effects model and the pooled Ordinary Least Squares (OLS) model. The reason for the application of a variety of models, is because this will offer us a way to choose better which model provides us the best fit.

In terms of the structure of the model, the model will be formed including one dependent variable and three independent variables. Moreover, in the section of independent variables, two interaction terms will be added.

Concerning the dependent variable, Gross Domestic Product (GDP) growth will be utilized as a proxy for economic growth. This is justified by academic literature that is common to be employed GDP growth as a way to measure how much the economy grows (Asongu & Odhiambo, 2020; Lukhmanova et al., 2025; Sun, Liu, Pan, Wang, & Zhang, 2025).

As for the independent variables, there are two components. One component is related to the measurement of fiscal policy and another component is related to the measure of corruption. Beginning with the variables related to fiscal policy, the variables chosen are government spending and tax revenue. This selection, is based on academic literature as an approach to measure fiscal policy (Thi Nguyen & Ho, 2024; Usmanova, 2023).

Regarding the variable related to corruption, the index of Corruption Perception Index (CPI) will be employed as a proxy for corruption. This index is produced by the international organization that is called Transparency International. CPI is used frequently as a reliable index in academic research to measure corruption (Jovović, 2021; Malanski & Póvoa, 2021; Saad Atef, 2020).

Furthermore, another component of the model concerning the independent variables, is the two interaction terms. These interaction terms capture how corruption can influence the way fiscal policy can affect economic growth. Therefore, because fiscal policy has been already operationalized in the current research through the variables of tax revenue and government spending, corruption interacts with these two variables.

Since in this stage, it has been defined that the variables which will be included in the model, it can follow the mathematical form of the model. The model is specified as shown below.

$$GDP_{it} = a_i + \beta_0 + \beta_1 \cdot Gov_{it} + \beta_2 \cdot Tax_{it} + \beta_3 \cdot Cor_{it} + \beta_4 \cdot Gov_{it} \cdot Cor_{it} + \beta_5 \cdot Tax_{it} \cdot Cor_{it} + \varepsilon_{it}$$

(1)

Explanation of terms.

i=1,2,3,4; t=1995,1996,…,2019

GDP = Growth Rate.

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Gov = Government Expenditure.

Tax = Tax Revenue.

Cor = Corruption Perception Index (CPI).

Regarding the assistance for the execution of the statistical analysis, it should be noted that it was employed predominantly the R language. Moreover, in a few cases other statistical software was employed whenever there were certain issues.

4. RESULTS

4.1. Descriptive Statistics

In this section, the results of the statistical analysis begin with the presentation of the results for descriptive statistics.

Figure 1 displays the descriptive statistics for each variable, covering essential metrics like measures of central tendency and the five-number summary, which includes medians. A notable difference between the mean and median typically points to a skewed (asymmetric) distribution. The dataset comprises 96 data points, collected from four countries over 24 years, spanning the period from 1995 to 2019. The variables analyzed include GDP Growth (gdp_d), Government Expenditure (gov_d), Tax Revenue (tax_d), and Corruption (cor_d), all expressed as differences in their logarithmic values.

```
> summary(df[,3:8])
     gdp_d              gov_d              tax_d              cor_d
 Min.   :-8.448    Min.   :-21.37221  Min.    :-12.6004   Min.    :-
21.256
 1st Qu.: 2.300    1st Qu.: -2.08244  1st Qu.: -0.6342   1st Qu.: -
2.868

   Median : 3.708    Median : -0.37634   Median :  0.7112   Median :
1.473
   Mean   : 3.416    Mean   : -0.08227   Mean    :  0.7155   Mean    :
1.258
   3rd Qu.: 5.557    3rd Qu.:  1.85407  3rd Qu.:  2.4112   3rd Qu.:
4.173
   Max.   :10.857    Max.    : 10.93329  Max.    :  6.7749   Max.    :
38.578
     gov_cor_d           tax_cor_d
 Min.   :-154.565   Min.    :-34.7902
 1st Qu.:  -6.413   1st Qu.: -1.5714
 Median :   0.000   Median :  0.6739
 Mean   :  -5.048   Mean    :  6.9171
 3rd Qu.:   5.201   3rd Qu.:  7.3862
 Max.   : 107.944   Max.    :134.0696
```

Figure 1. Descriptive statistics of all variables.

Figure 2 presents side-by-side boxplots for the four variables being analyzed. Although some outliers are visible across all variables, they have little to no effect on the estimated coefficients in terms of size or statistical relevance. With the exception of these outliers, the data distributions are largely symmetrical. Notably, the Corruption variable (cor_d) exhibits the most variation, which is evident from both its overall range and the width of its interquartile range (Difference between the third and first quartile).
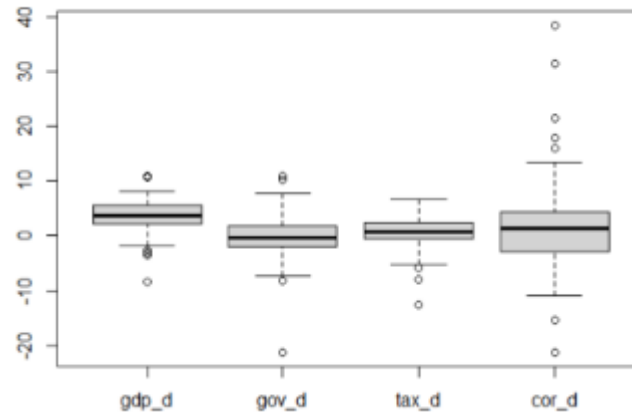
Figure 2. Boxplot of all variables.

4.2. Correlation

Figure 3 presents the Pearson correlation coefficients, which assess the degree of linear association between the variables. The analysis shows that GDP growth has a slight positive correlation with Corruption (cor_d), although this link is not statistically meaningful. On the other hand, GDP growth is negatively correlated with both Government Expenditure (gov_d) and Tax Revenue (tax_d). The relationship between GDP growth and Government Expenditure is statistically significant, with a p-value of 0.014, indicating a meaningful negative correlation. These associations are further illustrated in Figure 4 which includes scatterplots showing not only the linear relationships but also the interaction effects between Corruption and the two fiscal variables: Government Expenditure and Tax Revenue.

```
Correlation Coefficients
        gdp_d gov_d tax_d cor_d
gdp_d  1.00
gov_d -0.25  1.00
tax_d -0.09 -0.23  1.00
cor_d  0.15 -0.15  0.25  1.00


p-values for Correlation Coefficients
        gdp_d  gov_d  tax_d  cor_d
gdp_d
gov_d 0.0141
tax_d 0.4042 0.0259
cor_d 0.1405 0.1471 0.0135
```

Figure 3. Correlation coefficients of all variables.
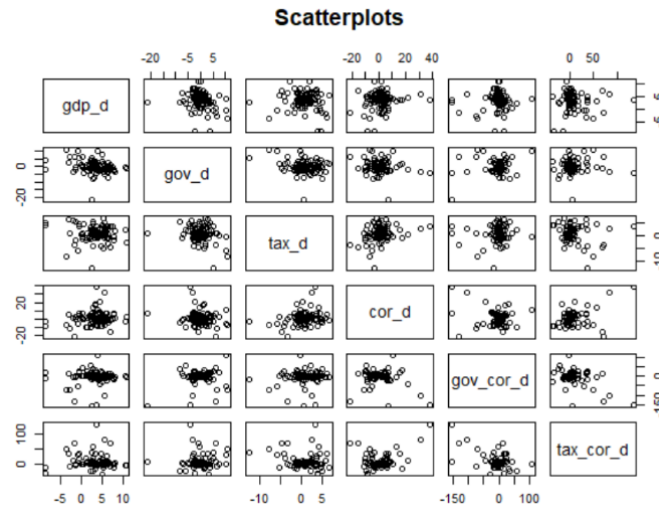
Scatterplots

Figure 4. Scatterplot matrix of the main variables.

4.3. Plot

Figure 5 displays a timeline of GDP growth for Greece alongside the other three countries, allowing for a direct comparison over the study period. Figure 6 continues with a time-based graph of GDP growth, the main variable of interest, featuring pooled regression lines to highlight overall trends.

In Figure 7, the average GDP growth for each country is tracked across the years, showing that Spain and Portugal generally experienced stronger economic growth than Greece and Italy.

Finally, Figure 8 illustrates the average annual GDP growth across all four countries, emphasizing the downturn caused by the financial crisis.
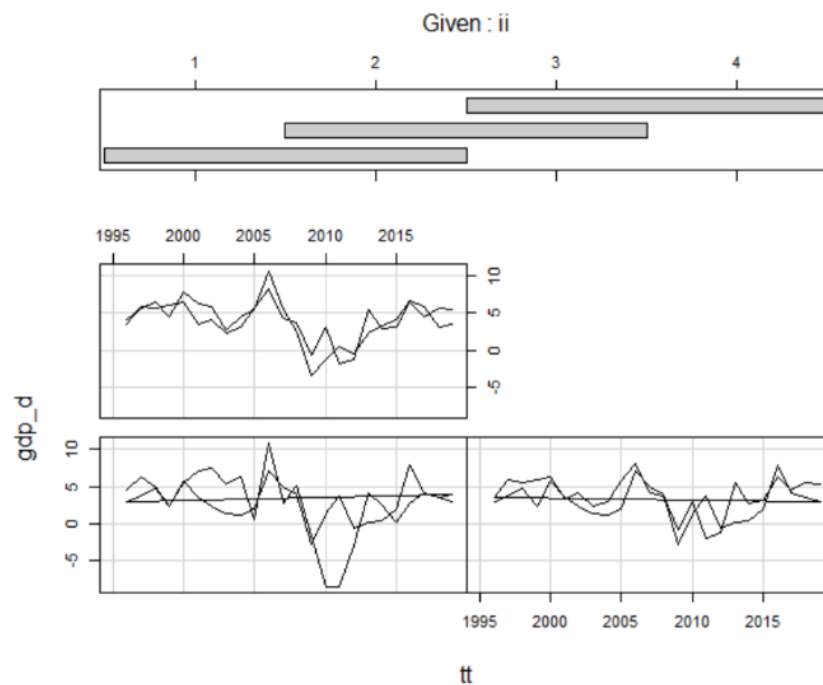

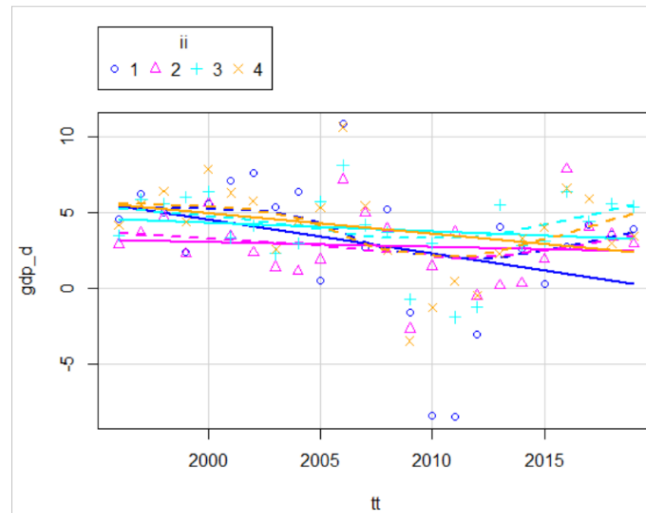**Figure 5.** Comparative GDP growth over time across all countries.

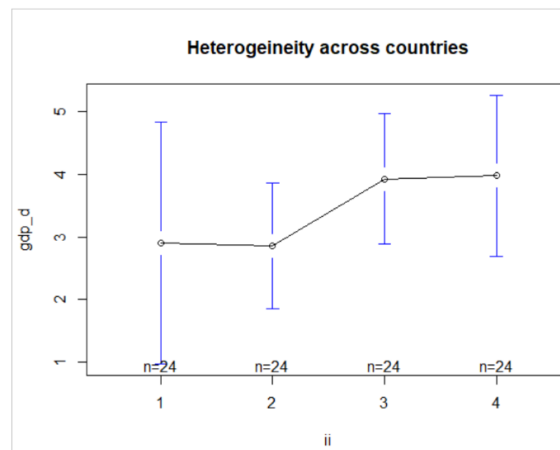**Figure 6.** GDP growth over time with pooled regression trends.

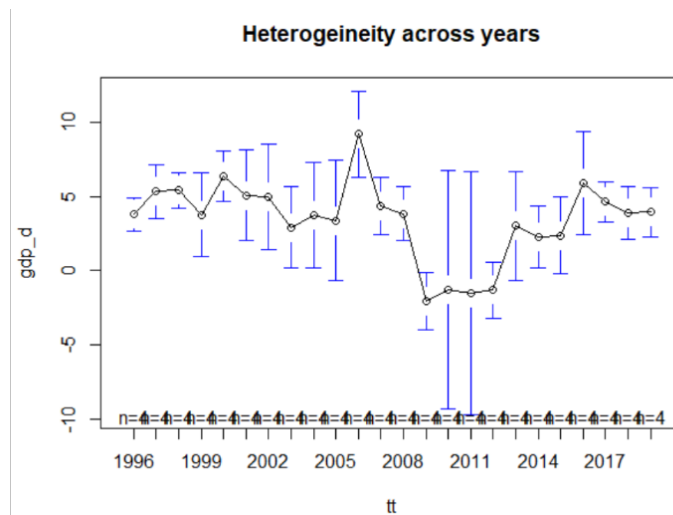**Figure 7.** Average GDP growth across all countries.

Figure 8. Average annual GDP growth across all countries

4.4. Breusch-Godfrey/Wooldridge Test for Serial Correlation in Panel Models

Figure 9 reveals patterns suggesting the presence of serial correlation in the dataset. This was formally validated through the Breusch-Godfrey/Wooldridge test, which confirmed that autocorrelation exists. To mitigate

this issue, the model was adjusted by introducing lagged variables, either for the explanatory variables or for the residuals, ensuring the reliability of the regression results.

```
data:  gdp_d ~ gov_d + tax_d + cor_d + gov_cor_d + tax_cor_d
chisq = 37.22, df = 24, p-value = 0.0416
alternative hypothesis: serial correlation in idiosyncratic errors
```

Figure 9. Breusch–Godfrey test for serial correlation.

4.5. Augmented Dickey Fuller Test

Figure 10 presents the results of the Augmented Dickey-Fuller test, which demonstrate that GDP growth, the dependent variable, is stationary, meaning its statistical properties remain consistent over time and it does not exhibit a unit root.

```
> library(tseries)
> adf.test(Panel.set$gdp_d, k=2)


        Augmented Dickey-Fuller Test

data:  Panel.set$gdp_d
Dickey-Fuller = -5.0238, Lag order = 2, p-value = 0.01
alternative hypothesis: stationary
```

Figure 10. Augmented Dickey–Fuller unit root test results for GDP growth.

4.6. Results of the Model

Multiple regression models were tested, each using GDP growth as the dependent variable. These models included the main independent variables shown in Table 1, along with additional exploratory variables that ultimately proved statistically insignificant. The R-squared value of 0.15 is considered acceptable, given the use of log-differenced data and the nature of the economic indicators involved. The overall F-statistic has a very low p-value, indicating strong model significance. For the key variables, Government Expenditure, Tax Revenue, and Corruption, the p-values from the t-tests are all below 0.047, confirming their statistical significance. In contrast, the interaction terms between these variables did not yield statistically significant results.

Based on the regression outcomes shown in Table 1, Government Expenditure emerges as the most influential variable in the model, as indicated by its lowest p-value. Both Government Expenditure and Tax Revenue have negative coefficients, while Corruption shows a positive coefficient. This suggests that an increase in government spending is associated with a decline in GDP growth. More precisely, a 1% rise in Government Expenditure corresponds to an estimated 0.24% drop in GDP growth. Similarly, a 1% increase in Tax Revenue is linked to a 0.26% reduction in GDP growth. On the other hand, a 1% rise in the Corruption Perception Index (CPI), which reflects lower corruption, leads to a 0.09% increase in GDP growth. It's important to clarify that the CPI ranges from 1 to 100, where higher scores represent lower levels of corruption. Thus, a 1-unit improvement in the CPI implies a 0.09% boost in GDP growth. The interaction terms included in the panel model, specifically between

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Government Expenditure and Corruption (ΔGov*Cor), and between Government Expenditure and Tax Revenue (ΔTax*Cor), do not show statistical significance, as their p-values exceed the 0.05 threshold.

The findings of this study do not fully align with the existing body of research. For example, prior studies, including those by Dkhissi (2024); Hassaine and Sahed (2021); Kalbiyev and Seyfullali (2024) and Madni and Chaudhary (2017) generally report a positive link between government spending and economic growth. Contrary to these expectations, the analysis for Italy, Greece, Spain, and Portugal revealed a negative coefficient for government expenditure. This result reflects a viewpoint more consistent with classical economic theory, which argues that higher public spending can potentially restrain growth. Similarly, tax revenue was expected to have a positive effect, as indicated in studies by Maheswaranathan and Jeewanthi (2021) and Nursini (2017) yet the data from this research showed a negative association.

In contrast, the results concerning the corruption variable were in line with earlier literature. The positive coefficient for the Corruption Perception Index (CPI) indicates that improvements in CPI scores, signifying reduced corruption, are linked to higher economic growth. This supports the view that rising corruption (reflected in falling CPI scores) can undermine growth, a conclusion also drawn in studies by Buterin, Škare, and Buterin (2017); Erum and Hussain (2019) and Simovic (2021).

Table 1. Regression results for GDP growth (Fixed effects, random effects, and OLS).

Dependent variable: ΔGDP			
Variables	**Fixed**	**Random**	**OLS**
ΔGov	–0.2411	–0.2411	–0.2411
	(0.005)	(0.004)	(0.005)
ΔTax	–0.2581	–0.2598	–0.2598
	(0.030)	(0.025)	(0.027)
ΔCor	0.0901	0.0879	0.0879
	(0.047)	(0.049)	(0.052)
ΔGov*Cor	0.0174	0.0177	0.0177
	(0.121)	(0.110)	(0.113)
ΔTax*Cor	–0.0052	–0.0063	–0.0063
	(0.772)	(0.720)	(0.721)
Intercept	3.591	3.6043	3.6043
	(0.000)	(0.000)	(0.000)
R^2	14.8%	14.8%	14.8%

Note: Coefficient estimates and p-values of the t-tests in parentheses.

5. CONCLUSION

The analysis demonstrated that both fiscal policy and corruption have a measurable effect on economic growth, as the variables representing these factors were found to be statistically significant. However, the interaction terms combining fiscal policy and corruption did not reach statistical significance and were therefore excluded from the final interpretation. Based on these findings, the null hypothesis of the first research question, which states that fiscal policy and corruption have no influence on economic growth, can be rejected. Instead, the alternative hypothesis is supported, confirming that these two elements do play a role in shaping economic growth.

Having established that fiscal policy and corruption influence economic growth, we can now turn to the second research question: if these factors do have an effect, is it positive or negative, and how strong is that effect? The analysis revealed that higher levels of government spending and tax revenue are linked to slower economic growth, while improvements in the Corruption Perception Index (CPI)—indicating lower corruption—are associated with faster growth. More precisely, a 1% rise in government spending as a share of GDP is linked to a 0.24% decline in GDP growth. Likewise, a 1% increase in tax revenue (relative to GDP) corresponds to a 0.26% drop in economic

growth. Conversely, a one-point increase in the CPI score results in a 0.09% rise in GDP growth, reflecting the positive impact of reduced corruption. Overall, the findings indicate that fiscal policy measures, as applied in the observed countries, along with corruption levels, tend to have a negative effect on economic performance.

Nonetheless, drawing firm conclusions from this study would lack scientific precision, given the constraints of the dataset, specifically, the inclusion of only four countries and a relatively short observation period of around two decades. Therefore, it would be inappropriate to broadly claim that fiscal policy and corruption consistently have a negative effect on economic growth. Instead, the results should be interpreted within the context of the specific Southern European nations examined. These countries share cultural, institutional, and historical traits that may shape their political and economic dynamics in unique ways. Additionally, the limited scope of the data, both in terms of geographic coverage and time frame, prevents us from making definitive statements regarding the acceptance or rejection of the null and alternative hypotheses with high confidence.

This study provides a useful starting point for future academic work. After exploring the effects of fiscal policy and corruption on economic growth in Southern European countries, a valuable next step would be to conduct a similar analysis focusing on Northern Europe. The reason for the inclusion of Northern Europe for future research, is because this will contribute to providing findings for the topic of "two-speed Europe". Therefore, with the inclusion of Northern Europe, there can be a comparative analysis between Southern Europe and Northern Europe. These two regions differ in levels of European integration, quality of institutions and prosperity levels, something similar to the concept of "two-speed Europe" (Kundera, 2019).

Regarding the policy recommendations derived from the results of the current research, the countries of Southern Europe can emphasize more the improvement of institutions through reforms in order to decrease corruption. This recommendation will also contribute to making fiscal policy a more effective tool that can stimulate economic growth.

Finally, the results of this research should be taken into account with caution since the sample is restricted to just certain countries of Southern Europe, and the availability of data was not that long for drawing valid conclusions. Moreover, because the research discusses social behavior the results can vary depending on the period, the sample and other factors, sometimes it is difficult to take them all into account. Because of these reasons, there was an attempt to reduce these limitations through the inclusion of interaction terms. These interaction terms would evaluate if the relationship between fiscal policy and economic growth is affected by corruption. However, these interaction effects were not statistically significant, meaning they do not provide sufficient evidence to support definitive claims. Overall, the study underscores the importance of considering both economic policies and political conditions when evaluating factors that drive economic growth.

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