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THE IMPACT OF ECONOMIC, POLITICAL, AND INSTITUTIONAL FACTORS ON BUDGET BALANCES OF THE HEAVILY INDEBTED EUROPEAN COUNTRIES

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Abstract: The present study identifies socioeconomic, political, and institutional factors that shape extensive budget unbalances in four European Mediterranean countries (Portugal, Italy, Greece, and Spain), causing significant deficits and a public debt equal to (or above) 120% of their respective Gross Domestic Product at the end of 2020. The regression analysis, run on official statistics, demonstrates that the dynamics of fiscal deficits in these countries are largely heterogeneous. This outcome suggests that the various factors and contexts considered here exert different effects in each country. Political factors played an important role in Greece, being less important in Spain, and having a negligible role in both Italy and Portugal. On the contrary, institutional factors were recognized as particularly important in Greece, Italy, and Portugal. Although important almost everywhere, the magnitude of the impact of economic factors also differed across the four countries.

Keywords:

budget balance;
current account balance;
public debt;
Excessive Deficit Procedure;
Southern European countries

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Introduction

By the end of 2020, the public debt of Southern European countries, according to Eurostat estimates, reached (or even overpassed) 120% of their respective Gross Domestic Product (GDP), doubling the maximum limit set by the Stability and Growth Pact (SGP), which is set at 60%. These countries, frequently recalled under the 'PIGS' acronym, include Portugal (135%), Italy (156%), Greece (206%), and Spain (120%), as indicated by Eurostat data. Particularly high budget deficits during the last decades – intensifying with the 2007 crisis – were at the base of the large public debt in these countries. We examine the issue of public debt in Southern European countries because of its great importance. A large (and growing) public debt has many economic consequences that have been extensively discussed in earlier literature (Modigliani 1961, Friedman 1978, Blanchard and Perotti 2002, Congressional Budget Office 2014, Reinhart et al. 2015).

The most important consequences include the following issues. First, the financial displacement of the private sector from the public sector. As state borrowing increases, a higher percentage of national savings goes to government securities and not to private investment finances. As a result, the public sector displaces the private sector, a phenomenon known as the "crowding-out" effect. Second, higher real interest rates. Given the insufficiency of total savings, the public sector exerts upward pressure on interest rates. Third, greater risks of a fiscal crisis. As debt continues to rise, investors might lose confidence in the government's ability to repay the costs of servicing the public debt (interest and amortisation). Fourth, overvalued exchange rates, the result of which is the widening of balance of payments deficits. Fifth, decreased state ability to respond to problems, by limiting the possibilities of fiscal policy and economic policy in general to exercise their interventionist role in the economy.

Under such conditions, the effectiveness of fiscal policy as a means of stabilising the economy is significantly limited. The problem is more serious in the Eurozone member states, such as the specific four Mediterranean countries under consideration, which have lost the autonomy of their monetary policy, since it is exercised centrally by the European Central Bank. So, while Japan, for example, has a very high public debt (amounting to 267% of its GDP at the end of 2020 according to estimates provided by the country's Ministry of Finance), it does not face the same risk of default as the countries under consideration for the main reason that it maintains the independence of its monetary policy.

There are several macroeconomic factors that affect the budget balance. The most important ones are the real GDP, the level of unemployment and the external sector of the economy, namely the current account balance. We assume that the real GDP growth and unemployment reduction may improve the budget balance, since an

increase in total output is associated with increases of budget revenues. Decreasing unemployment is in turn associated with reductions in public expenditures, mainly social transfers. The relationship between the current account balance and budget balance is a more complicated issue. In fact, the correlation between the budget balance and current account balance is the core issue of the so called "twin deficits hypothesis", according to which large and growing budget deficits are reflected in the widening of current account deficits, leading to the inherent decline in the economic policy credibility, macroeconomic imbalances, and a slowdown in economic growth (Miller and Russek 1989, Cavallo 2005).

This hypothesis was at the base of an extensive literature that empirically confirmed the interdependence of the budget balances and the current account balances without providing a clear answer for the direction of causality (Papadogonas and Stournaras 2006, Kalou and Paleologou 2012, Tang and Fausten 2012, Algieri 2013, Forte and Magazzino 2013, Bird et al. 2019, Ahmad and Aworinde 2020, Furceri and Zdzienicka 2020, Afonso et al. 2021). A possible conclusion is that, at least in the long run, the two outcomes are co-integrated, implying the existence of a long-term equilibrium relationship (Tang and Fausten 2012). The budget balance is also dependent on its previous, short-term development path (e.g., one-year or two-year lag). As a matter of fact, the one-year lag and, more rarely, the two-year lag of the dependent variable is used to allow for any existing adjustment process and persistence of budget balance (Petrakos et al. 2021b).

Political and institutional factors were also demonstrated to influence the budget balance. In the recent past, the influence of political fiscal cycles and Political Budget Cycles (PBCs), and the impact of rules and policies of European Institutions (e.g., those aimed at reducing public sector deficits in the EU countries) were extensively documented. Earlier studies have revealed that, in general, the PBC magnitude and persistence decline when (i) the level of socioeconomic development rises (Block 2002, Shi and Svensson 2006, Vergne 2009)[1]; (ii) the quality of institutions improves (Persson and Tabellini 2005); (iii) the transparency of the political process increases (Klomp and De Haan 2013b) – with the introduction of checks and balances on governance functions; and when (iv) the level of democratic maturity consolidates, usually together with the age of democracy (Shi and Svensson 2003, Akhmedov and Zhuravskaya 2004, Brender and Drazen 2005, Brender and Drazen 2007, Klomp and De Haan 2013a). Another factor affecting PBCs is the extent of media freedom. The restriction of press freedom reduces citizens' information as far as government action is concerned and it prevents them from having a clear picture of the economic policy

[1] The existing empirical research has confirmed that PBCs are more evident in developing economies (De Haan and Sturm 1994, Brender and Drazen 2005, Shi and Svensson 2006, Prichard 2018).

at large (Alt and Lassen 2006, Ademmer and Dreher 2016, Veiga et al. 2017)[2].

Moreover, the four Mediterranean countries considered in this study have entered the Excessive Deficit Procedure (EDP) under the Corrective Arm of the SGP, for long time intervals. Namely, Portugal has been subjected to the EDP between 2005 and 2017, Italy between 2005 and 2013, Greece between 2004 and 2017 (with a brief stop between 2007 and 2009) and Spain between 2009 and 2019. These long periods during which the four countries were subjected to EDPs justify a specific study of these countries' dynamics with the final aim of investigating the effectiveness of the EDP of the SGP in reducing public deficits and, possibly, PBCs. It should be noted that the issue of the effectiveness of the SGP in consolidating public finances of the EU member states (European Commission 2021) is at the heart of the current debate on the aims and directions of its revision (Mileusnic 2021).

The present work aims at investigating the main economic, political, and institutional factors which affected the public budgets of these four European countries since the early 1970s and leading to increased public sector deficits. Assuming heterogeneous (cause-effect) relationships in the Mediterranean economic space (Salvati 2016, Carlucci et al. 2017, Salvati 2018), we tested (i) the growth rate of real GDP, (ii) the unemployment rate, and (iii) the external sector of the economy (namely the current account balance), as key economic variables affecting the budget balance. Moreover, as we have already stated, we examined the effects of various political and institutional factors on the budget balances of the four Southern European Countries.

Methodology

Our motivation for this research stems from Figure 1, where the European Union countries are classified according to their corresponding general government consolidated gross debt (GD) as percentage of their GDP in 2020 (GD/GDP), according to Eurostat. More specifically, the first group includes those countries whose public debt as percentage of GDP was at least two times higher than the maximum allowed by the SGP, namely 60% of GDP. The second group includes the countries whose public debt as percentage of GDP was significantly higher than the maximum allowed by the SGP (between 80 and 120). The third group includes the countries whose public debt as percentage of GDP was higher than the maximum allowed by the SGP (between 60 and 80). The fourth group consists of countries whose public debt as percentage of

[2] Very often, despite the "institutionalised freedom" (that we might call "nominal freedom") of the media, the politicians in power enjoy the so called 'incumbency advantage' (Bohn 2019), that is that they have a greater coverage, and they are evaluated more positively than their political opponents (Freier 2015). This capacity of incumbents is facilitated using optimistic economic forecasts during the election years which provide them with room for fiscal manoeuvre (Bohn and Veiga 2021).

GDP was lower than the maximum allowed by the SGP (between 40 and 60). Finally, the fifth group includes those countries whose public debt as percentage of GDP was much lower than the maximum allowed by the SGP, i.e., below 40. In 2020, only the four Southern European countries under consideration had a public debt that amounted to at least 120% of their respective GDP (Portugal: 135%, Italy: 156%, Greece: 206%, and Spain: 120%).

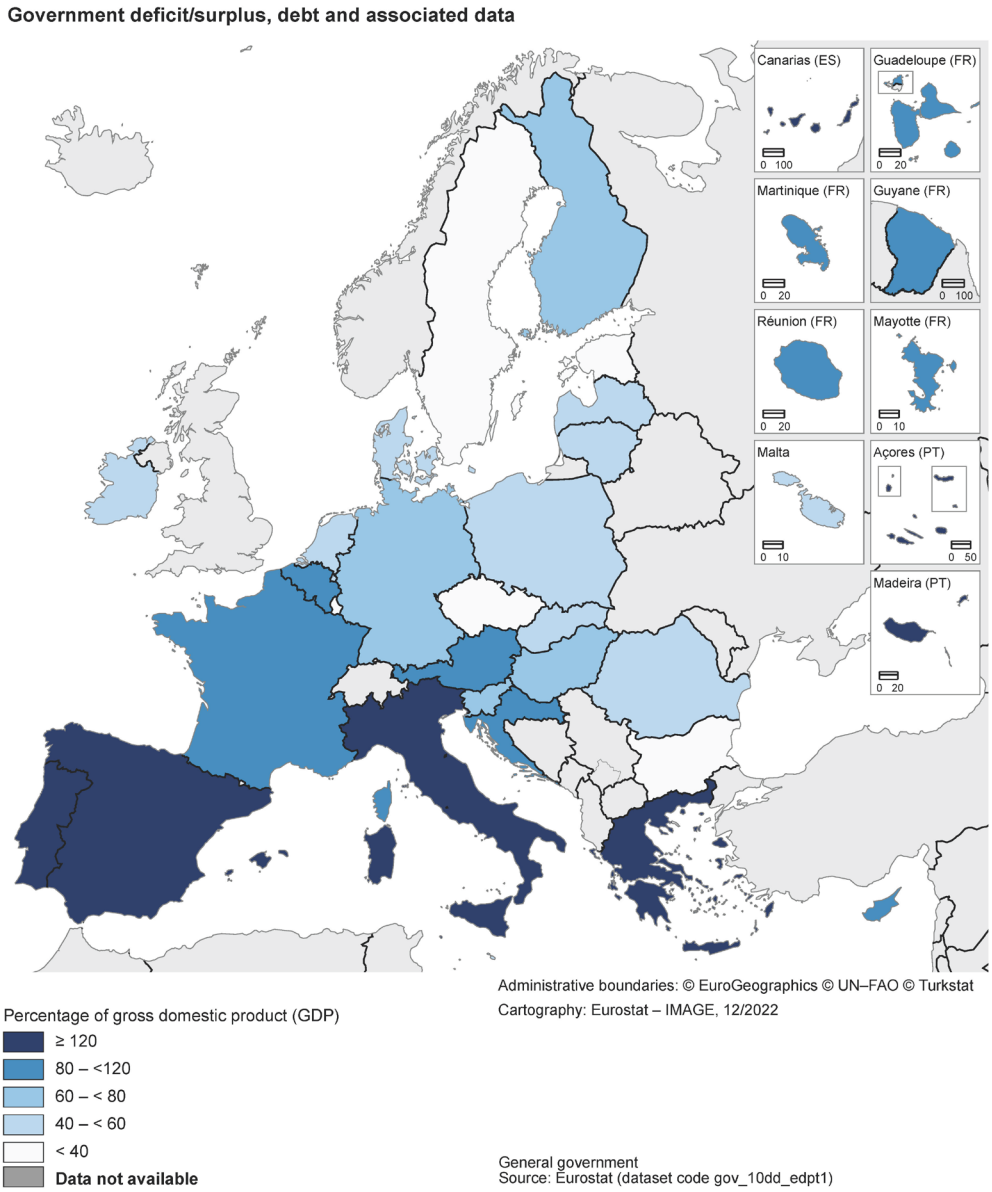

Figure 1. Government consolidated gross debt as a percentage of GDP for the European Union countries in 2020

To investigate the effects of economic, political, and institutional factors on the budget balances of the most heavily indebted European countries (Portugal, Italy, Greece, and Spain), an empirical and exploratory approach was adopted based on regression models run on annual data that cover half a century between 1970 and 2020. However, the year 2020 was omitted from the empirical analysis because of the sudden impact of Covid-19 pandemic on the macroeconomic variables, a confounding issue that cannot be examined explicitly in the context of our empirical models.

As we have already stated, the real GDP growth rate, the rate of unemployment and the current account balance are assumed here as the most important economic variables affecting the Actual Budget Balance (ABB), taken as the dependent variable. However, we use two lagged dependent variables (lag-1 and lag-2), namely ABB-1 and ABB-2, as predictors to allow for any adjustment process of budget balances, as it is described below. The use of lag-1 and lag-2 variables prevented the use of predictors referring to 1970 and 1971.

In order to examine the effects of political and institutional factors on budget balances we resort to World Bank indicators. The World Bank estimated a set of political and institutional variables called governance indicators and it released a dedicated database entitled 'Worldwide Governance Indicators', including six variables (the extent of public sector corruption, the level of government effectiveness, the extent of political stability and the absence of violence, the degree of regulatory quality, the extent of the rule of law, and the degree of existing accountability). Although these political and institutional indicators are widely used in empirical research, they are associated with two disadvantages. First, they cover only a short period, namely the years since 1996. Additionally, the estimates for 1997, 1999 and 2001 are unavailable, thus limiting the total number of observations and preventing their incorporation in an extensive, time series regression analysis, being in turn highly cross-correlated. Based on this rationale, the above indicators were considered in the context of this research only in a qualitative manner.

The existence of political fiscal cycles or PBCs in PIGS countries was also tested in our study. According to the literature (Petrakos et al. 2022a, 2022b), PBCs are associated with the direct efforts of governments to maximise their chances of re-election or to minimise the risk of votes' loss by pursuing opportunistic expansive fiscal policies in the last months before the elections. These policies are undertaken with the sole aim to give voters who are supposed to have a "myopic perspective" a false impression (Bonfiglioli and Gancia 2013). More specifically, government action is assumed to opportunistically exploit "informational asymmetries" of voters (Persson and Tabellini 2000), mainly due to the existence of weak media, by providing the impression that the economic policy pursued is effective and therefore contributes to improving social welfare (Rogoff and Sibert 1988, Rogoff 1990, Alesina et al. 1993, Alesina et al. 1997, Shi and Svensson 2003,

Shi and Svensson 2006, Brender and Drazen 2007, Brender and Drazen 2008, Bonfiglioli and Gancia 2013, Veiga et al. 2017, Bohn 2019, Bohn and Veiga 2021).

The effectiveness of European Institutions aimed at reducing public sector deficits is the main institutional factor considered in this study. The Treaty on the Functioning of the European Union and, in particular, the Corrective Arm of the SGP, established the EDP as the mechanism limiting the PBC risk. Having together "preventive" and "corrective" aims, the mechanism has been designed to prevent European Union member states from having "excessive" public sector deficits, i.e., overpassing 3% of the country's GDP, or to correct them in case they occur[3]. It is noted that the SGP, which is in principle a political commitment of the EU member states, and the Treaty of the European Union, constitute the framework of the EU fiscal policy.

More specifically, it is the effectiveness of EU fiscal rules on limiting budget deficits and consequently PBCs[4] that we examine here. Earlier studies found that SGP did not affect politically motivated fiscal policy (Mink and De Haan 2006). In other words, SGP seems to be almost ineffective in reducing PBCs (Efthyvoulou 2012). However, Gootjes et al. (2019), using a broad measure of fiscal rules, find that, since the global financial crisis of 2007, PBCs have only occurred in countries with weak fiscal rules. This broad conclusion implies that, in the case of countries subjected to the EDP such as PIGS, that are mature democracies and have strong fiscal rules, we should expect that national elections do not significantly affect national fiscal policies causing PBCs.

Data and variables

The actual budget balance (ABB) expressed as a percent share of GDP in the respective country, based on Eurostat definition and measurement, was taken as the dependent variable. ABB quantifies the total effects of fiscal policies of the respective countries on electoral and non-electoral periods, since it incorporates the effects from both the revenue side of the state budget, via the reduction of general government taxes, and the expenditure side of the state budget, via increases in general government spending. We express the budget balance as per cent share of GDP – and not in absolute monetary terms – for three reasons. First, because the percentages in principle provide a more reliable measure of the relative magnitude of a given variable than the absolute values.

[3] The SGP is a set of rules designed to ensure two main objectives. First, that EU member states pursue sound public finances and, second, that they coordinate their fiscal policies. The EDP of the SGP is a step-by-step procedure that tries to ensure that EU member states adopt appropriate policy responses to reduce their "excessive" deficits.

[4] In general, fiscal rules intended to limit or to prohibit public deficits reduce the government's capacity to behave opportunistically and therefore to create PBCs (Rose 2006, Von Hagen 2006, Alt and Rose 2009, Benito et al. 2013, Klomp and De Haan 2013a). However, there is also the counter-argument that fiscal rules might induce elected politicians in power to circumvent them by resorting to 'creative accounting' (Milesi-Ferretti 2004).

Second, because per cent terms remove the long-term effect of inflation on the examined variable. Third, because the main budgetary constraint of the EU member states is to avoid entering the EDP, which is enforced when a member state has breached, or is at risk of breaching, a budget deficit above 3% of the country's GDP (Petrakos et al. 2021a). Predictors of ABB include five cardinal variables and two dummy variables as described in the following lines.

Regarding the one-year and two-year lag of actual budget balance (ABB-1 and ABB-2) as per cent share of GDP in the respective country, this variable assumes that the budget balance of the previous one (or two) year(s) might affect the budget balance of the current year, suggesting how the budget balance might be "compounded". The one-year (or two-year) lag of the dependent variable expressed as per cent share of GDP may delineate slow adjustment processes and the persistence of budget balance's temporal structures.

The growth rate of the total real GDP (TYGR) estimated by Eurostat was introduced as a predictor of ABB, assuming that a slowdown in economic growth may stimulate the government to increase further public expenditures and to reduce the ABB in order to limit economic and social impacts of stagnation. Conversely, a sustained economic growth allows the government to raise public revenues and to increase the ABB. The unemployment rate (UNR) released by Eurostat was assumed as an additional factor pressing governments to increase public expenditures, mainly on social transfers, and to reduce ABB in order to limit the economic and social impact of such conditions. Conversely, lower rates are usually associated with rising public revenues and reduced public expenditures, thus increasing ABB.

The current account balance (CAB) released by the World Bank as per cent share of GDP in a given country was introduced with the aim at examining whether there is a causal relationship between CAB and ABB, i.e. to test the validity of the so-called "twin deficits hypothesis", in turn incorporating two dummies: Election (ELE), a dummy assuming the value of 1 in the years of general/national elections in a given country and 0 otherwise; and EDP, a dummy assuming the value of 1 in the years during which each individual country had been subjected to the EDP and 0 otherwise.

Statistical analysis

Following the standard literature on PBCs (Shi and Svenson 2006, Veiga and Veiga 2007, Sakurai and Menezes-Filho 2011, Chortareas et al. 2016), the following model's specification was adopted (Ciommi et al. 2019). Let y_i^c denote the observed annual value of the actual budget balance (ABB) of the c country (c = 1 for Portugal, 2 for Italy, 3 for Greece, and 4 for Spain), considered as the response variable on the i-th time segment (i = 1 to 49), covering the time interval between 1970 and 2019. Furthermore,

let x_{ji}^{c} denote the observed value of the cardinal variables j (with j = 1 to 5) and the observed value of dummies z_{ki}^{c} (with k = 1 or 2) on the i-th time segment (Mancini et al. 2018). The average response variable was modelled as a linear combination of predictors (Lamonica et al. 2020) as follows:

$$\mathrm{E}(y_i^c) = \beta_0 + \sum_{j=1}^{5} \beta_j^c \, x_{ji}^c + \sum_{k=1}^{2} \gamma_j^c \, z_{ki}^c \qquad (1)$$

The results of the above model, estimated via the Ordinary Least Square regression (Salvati et al. 2018), were reported separately for each country.

Results

Greece

The empirical model for ABB in Greece has a good fit (adjusted R2 = 0.758) and statistical significance (F = 30.4, p < 0.0001), with significant predictor's coefficients (Table 1). The standardised residuals of the model were symmetrically distributed around the zero mean with s = 2.17, with four outliers (2.33, -2.37, -3.42, and 2.56) with high self-sensitivity (leverage score) corresponding with 2000, 2009, 2014, and 2015, respectively. Three more influential observations with Cook's distance > 0.2, corresponding to 2008, 2012 and 2013, respectively, were illustrated in Figure A1 (Appendix). The Shapiro-Wilks test results were weakly significant (0.94, p = 0.023) and they delineate a moderate departure of residuals from normality, as clearly shown in the QQ plot, due to the presence of the outliers mentioned above. However, the relative plots in Figure A2 (Appendix) reveal no serious estimation issues. The Low Variance Inflation Factor (VIF < 2) indicates the absence of multicollinearity.

Italy

The empirical model for ABB in Italy showed an excellent fit (adjusted R2 = 0.91) and a high significance (F = 122.8, p = 0.0001), with most of the predictors receiving significant regression coefficients (Table 1). Standardised residuals of the model were symmetrically distributed around zero mean with s = 1.06, with the presence of two outliers valued at 2.64 and 2.39 with high self-sensitivity (leverage score) corresponding to 1998 and 2009, respectively. Two influential observations with Cook's distance > 0.15, corresponding to 1976 and 1997, were illustrated in Figure A3 (Appendix). Furthermore, the Shapiro-Wilks test (0.977, p = 0.440) rejected the hypothesis of residual deviation from normality, in line with the QQ plot and the additional plots shown in Figure A4 (Appendix). The Low Variance Inflation Factor (VIF < 2) indicates no multicollinearity issues in the data.

Table 1. Model results explaining the budged balance (ABB) variability

Country	Predictor	Coefficient	Standard Error	*t*-Statistic	*p*-value
Greece	Constant	0.826	0.768	1.08	0.288
	ABB-1	0.603	0.126	4.79	0.000
	ABB-2	0.316	0.130	2.43	0.019
	CAB	0.283	0.099	2.85	0.007
	ELE	-2.075	0.678	-3.06	0.004
	EDP	2.114	0.779	2.71	0.010
Italy	Constant	-4.560	0.917	-4.97	0.000
	ABB-1	0.923	0.050	18.31	0.000
	UNR	0.369	0.080	4.61	0.000
	TYGR	0.353	0.086	4.10	0.000
	EDP	1.467	0.481	3.05	0.004
Portugal	Constant	2.98	2.81	1.06	0.294
	ABB-1	0.481	0.137	3.51	0.001
	CAB	0.189	0.078	2.47	0.018
	TYGR	0.194	0.107	1.82	0.076
	UNR	-2.20	1.18	-1.87	0.068
	EDP	2.27	1.06	2.14	0.038
Spain	Constant	-0.474	0.355	-1.34	0.188
	ABB-1	1.194	0.134	8.93	0.000
	ABB-2	-0.404	0.132	-3.06	0.004
	ELE	-0.902	0.490	-1.84	0.073

Portugal

The empirical model explaining the ABB for Portugal with the use of seven predictors was significant ($F = 17.9$, $df = 5$, $p < 0.0001$), displaying an adjusted $R2 = 0.638$ (Table 1). The model assigned significant regression coefficients to ABB-1, CAB, and EDP. TYGR and UNR were weakly significant. Based on the results of preliminary statistical tests, the UNR variable (x_4^1) has been transformed via square root function and added in the final model. Specifically for Portugal, this transformation assumes that, as unemployment increases, the actual budget balance will drop (given the negative coefficient of UNR) at a decreasing rate. In other words, the expansionary fiscal policy measures, which tend to decrease the actual budget balance, are more effective in reducing unemployment when there is spare capacity in the economy, i.e., when the unemployment rate is high. At the limit, as the unemployment rate tends to zero, incurring budget deficits will have no impact on unemployment.

The standardised residuals of the model fit are symmetrically distributed around the zero mean with $s = 1.87$, with the presence of one outlier valued at -2.33 corresponding to 2011. Two more influential observations were identified with Cook's distance > 0.15

and high self-sensitivity (leverage score), corresponding to 1982 and 2010, respectively (Appendix: Figure A5). Furthermore, Shapiro-Wilks test (0.95, p = 0.06) rejected the hypothesis of significant deviations of residuals from normality, in line with the results of QQ plot (Figure 2). Additional information on residuals were shown in Figure A6 (Appendix), revealing no serious divergence from the basic model's assumption. In addition, the low Variance Inflation Factor (VIF < 2) indicates no multicollinearity issue.

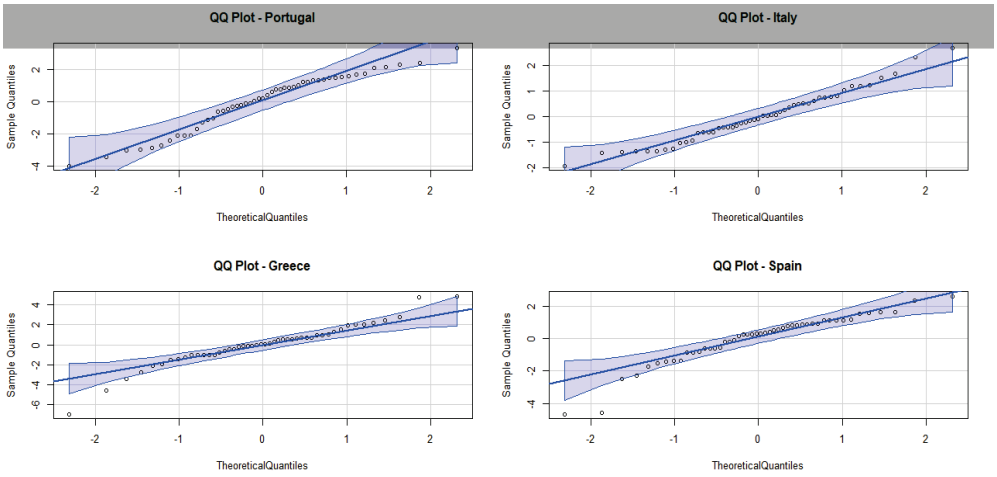

Figure 2. QQ plots by country

Spain

The empirical model for Spain showed a good fit (adjusted R2 = 0.786), a high significance overall (F = 53.8, p = 0.0001), and few significant regression coefficients (Table 1), which include ABB-1 and ABB-2, as well as ELE, although the latter was only weakly significant. The standardised residuals were symmetrically distributed around the zero mean with s = 1.54 and the presence of three outliers (-3.25, -3.58, and 2.15) corresponding to 2009, 2010, and 2011, respectively. Two influential observations with a large leverage score and Cook's distance were identified in 2008 and 2009, respectively (Appendix: Figure A7). The Shapiro Wilks test was moderately significant (W= 0.91, p = 0.002), delineating a weak departure of residuals from the normality assumption, due to the presence of the three outliers. The inspection of Figure A8 (Appendix) revealed no serious divergences with the basic assumptions' characteristic of model's residuals. The Low Variance Inflation Factor (VIF < 2) indicated no multicollinearity.

Discussion

The statistical analysis delineates how budget balances of the four countries were not affected by the same economic, political, and institutional factors or, at least, these

factors did not affect them to the same degree. In other words, PIGS countries were not associated with the same patterns regarding the consolidation and determinants of their budget balances. A comparative summary of the model's results (Table 2) indicates that the actual budget balance (ABB) of the four countries was largely affected by the one-year lag of the same variable (ABB-1). Moreover, in the cases of Greece and Spain, ABB was affected by the two-year lag of their budget balance (ABB-2), although in a different way (positive and negative influence respectively for Greece and Spain). The unemployment rate (UNR) exerted a positive influence on ABB in the case of Italy and a negative influence in the case of Portugal. The external sector of the economy and the Current Account Balance (CAB) positively affected ABB in the cases of Portugal and Greece, having a more significant impact in the latter country. In other words, the results suggest how the 'twin deficits hypothesis' may apply only in the cases of Portugal and Greece. Moreover, the ABB of Portugal and Italy seems to be positively affected by the corresponding TYGR.

Table 2. A synopsis of (significant) impacts on the actual budget balance based on regression model's coefficients by country

Predictor	Portugal	Italy	Greece	Spain
ABB-1	0.481	0.923	0.603	1.194
ABB-2			0.316	-0.404
UNR	-2.20	0.369		
CAB	0.189		0.2831	
TYGR	0.194	0.353		
ELE			-2.075	-0.902
EDP	2.270	1.467	2.114	

Based on these findings, the hypothesis of political budget cycles seems to apply only to the cases of Greece and Spain. However, its effects – as measured by the model coefficients – were more intense for Greece (-2.075) than for Spain (-0.902). Social instability, the supposed weakness of national institutions, and an ineffective system of checks and balances may justify the negative impact of PBCs on ABB in Greece. Consequently, reducing public deficits and consolidating public debt in Greece seems to be much more difficult in political terms (and less acceptable from a purely social perspective) than in the other Mediterranean countries evaluated in this study[5].

On the contrary, the EDP seems to be effective in reducing public sector deficits (and, consequently, in limiting PBCs) in the cases of Portugal, Italy, and Spain, but not to the

[5] We have empirically estimated that PBCs in Greece not only increase public sector deficits but, more importantly, they destabilise the economy, a fact of particular importance (Petrakos et al. 2022c).

same degree based on the regression coefficients, being likely more effective in Portugal (2.27) and Spain (2.11), and less effective, but still important, in Italy (1.47). In general, we conclude that the fiscal rules imposed by the European Institutions in the context of the SGP are effective on limiting budget deficits even in the case of highly indebted European countries. In the case of Greece – where PBCs are very serious – the positive effects on ABB caused by the EDP seem to outweigh the negative effects of PBCs (2.11 vs -2.08 regression coefficients). The SGP in Greece was therefore seen as a necessary mechanism for achieving the required adjustment of public finances.

The results of our analysis regarding PBCs in Portugal, Italy, and Spain are in accordance with earlier studies stating that the phenomenon is more evident in developing countries (Brender and Drazen 2005), and almost negligible or very limited in developed economies (Andrikopoulos et al. 2004, Shi and Svensson 2006, Mandon and Cazals 2019). Greece seems to be an exception, having from this respect the characteristics of a developing economy, which are mainly the limited quality of its institutions (Afonso et al. 2015) and the weak checks and balances (Trantidis 2016), considering also that its governments are often accused of clientelism (Mitsopoulos and Pelagidis 2011) and populism (Christodoulakis 2019). As for the results of our analysis referring to the effectiveness of the EDP in Portugal, Italy, and Greece, they are in contrast with earlier studies supporting its ineffectiveness in stabilising budget balances (Mink and De Haan 2006) but are in accordance with more recent research outcomes on the issue (Efthyvoulou 2012, Gootjes et al. 2019, De Jong and Gilbert 2020).

Conclusions

The basic objective of this study was the investigation of the main economic, political, and institutional factors that affect the budget balances of the heavily indebted Southern European countries, that is Portugal, Italy, Greece, and Spain, frequently recalled under the 'PIGS' acronym. We found that the dynamics of budget deficits in these countries are largely heterogeneous, implying that the various factors and contexts considered exert different effects in each individual country. However, the extent of this effect differs significantly in magnitude between these countries. In all four countries, the budget balance of a given year is affected by the budget balance of the previous year and in some cases (e.g., Greece and Spain), by the budget balance of the year before. The budget balances in these Southern European countries are also affected by some macroeconomic variables (the growth rate of total output and the rate of unemployment in Portugal and Italy; the current account balance in Greece and Portugal, implying that the external sector of the economy affects state budget balance). The European Institutions, namely the Excessive Deficit Procedure of the Stability and Growth Pact, seem to contribute to the stabilisation of public finances in Portugal, Italy, and Greece, with no significant effects in the case of Spain. Political factors such as the

political business cycles seem to negatively affect budget balances only in two countries, namely Spain and Greece, with no effects in the others. However, they have limited effects in Spain while being rather large in Greece.

There are of course other factors that affect the budget balance that have not been considered in our models because their official measures or estimates are only available for short time intervals. We have already pointed out the importance of 'governance indicators' provided by the World Bank for a restricted time period (1996-onwards). With this perspective in mind, future studies should make a more extensive use of these (or similar) indicators. This informative set of variables may delineate a different analysis' frame revealing the importance of other political and institutional factors in consolidating budget balances, such as political stability, the level of government effectiveness, and the degree of regulatory quality.

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APPENDIX

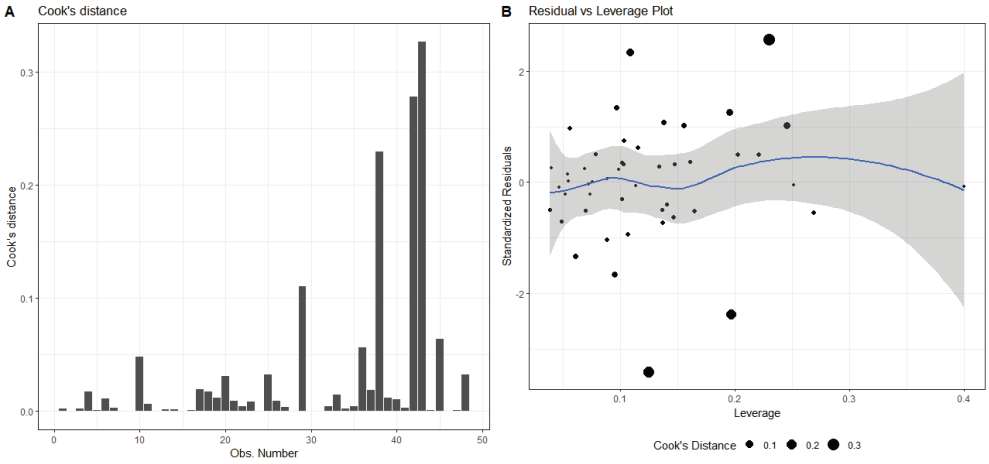


Figure A1. Cook's distance and Leverage plots for Greek data

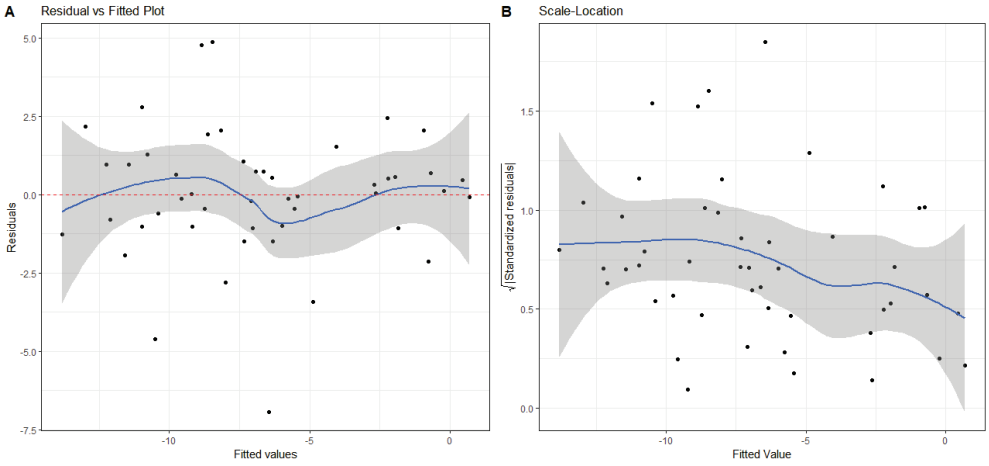


Figure A2. Residual plots for Greek data

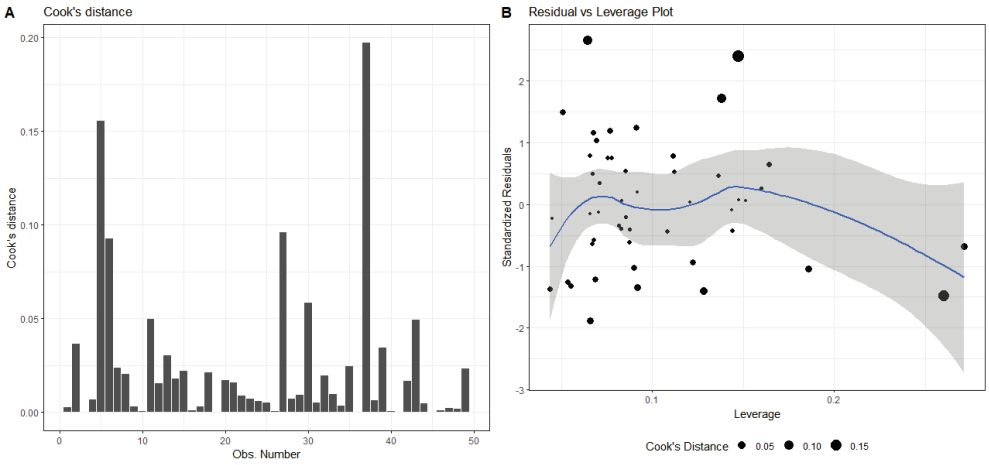


Figure A3. Cook's distance and Leverage plots for Italian data

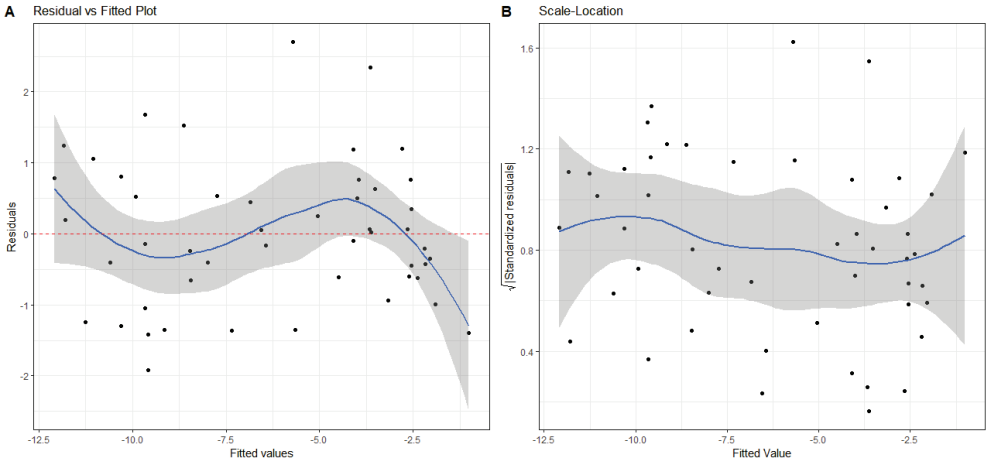


Figure A4. Residual plots for Italian data

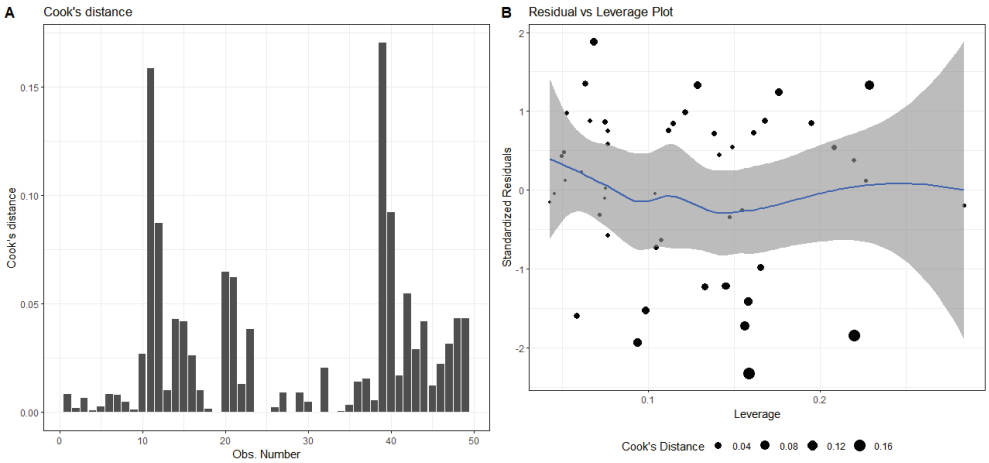
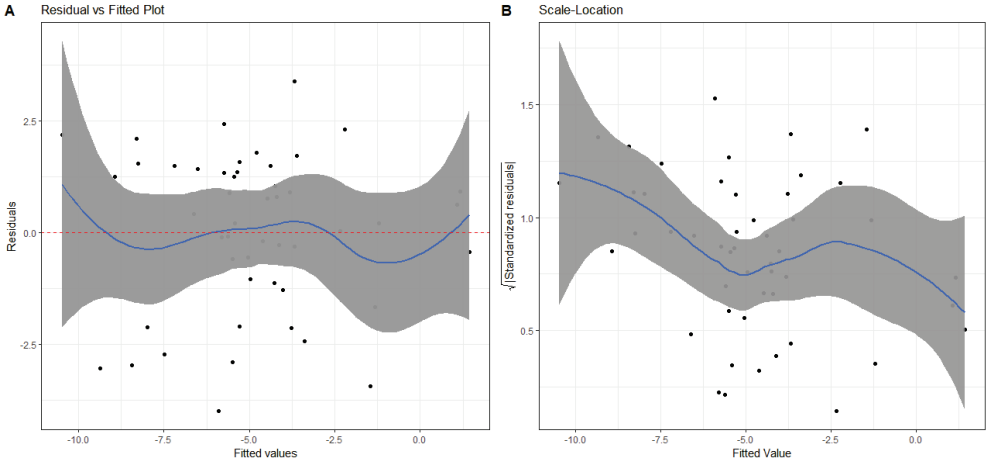


Figure A5. Cook's distance and Leverage plots for Portuguese data



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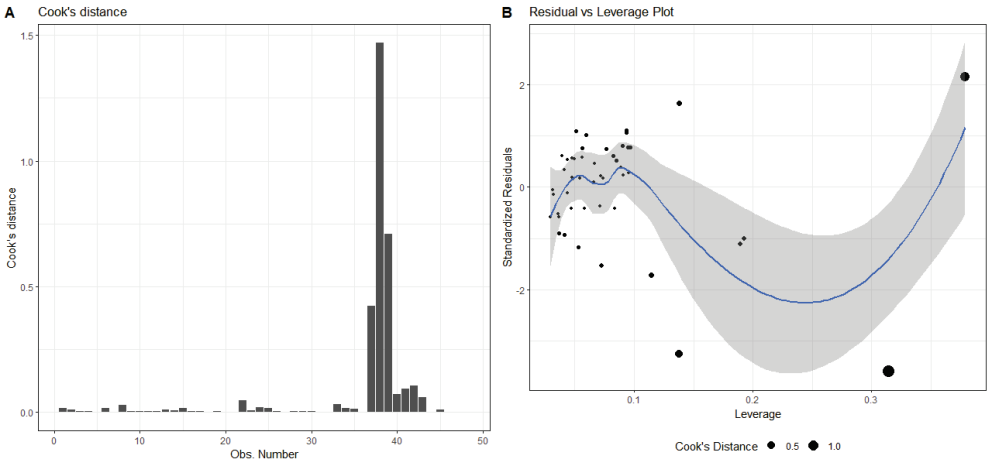

Figure A7. Cook's distance and Leverage plots for Spanish data

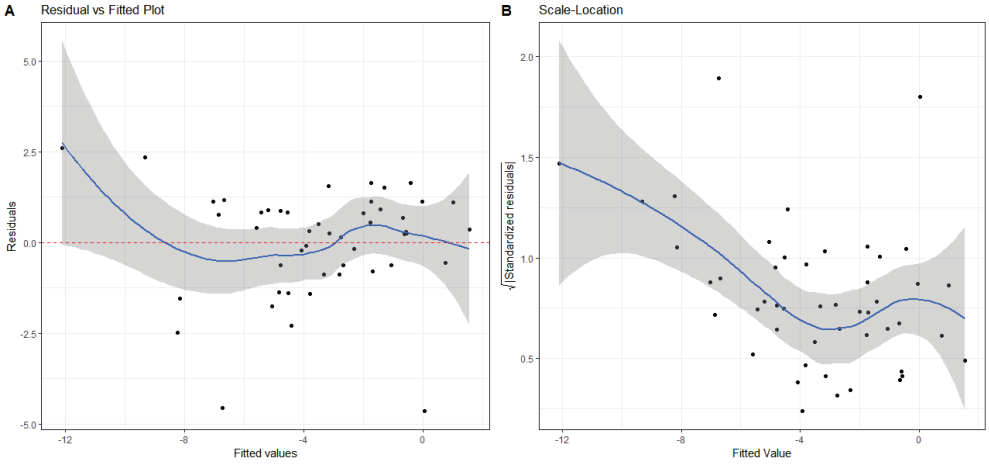

Figure A8. Residual plots for Spanish data