Political budget cycles and effects of the excessive deficit procedure: The case of Greece

George Petrakos
Panteion University of Social and Political Sciences, Athens, Greece
E-mail: petrakos@panteion.gr

Konstantinos Rontos
University of the Aegean, Mytilene, Greece
E-mail: k.rontos@soc.aegean.gr

Chara Vavoura
University of Athens, Greece
E-mail: cvavoura@econ.uoa.gr

Luca Salvati
University of Macerata, Italy
E-mail: luca.salvati76@gmail.com

Ioannis Vavouras
Panteion University of Social and Political Sciences, Athens, Greece
E-mail: vavouras@panteion.gr

We study the existence, magnitude, and determinants of political budget cycles in Greece over the past 40 years. We find that the Greek economy has been characterised by extensive electorally-motivated cycles, which are not typical of a developed country. However, we show that the corrective fiscal measures imposed by the European institutions in the face of the Greek debt crisis suppressed these pre-electoral fiscal policy manipulations. In particular, the imposition of the Excessive Deficit Procedure of the Stability and Growth Pact reduced the ability of domestic politicians to increase public deficits to the point where it eliminated, albeit only marginally, political budget cycles.

Introduction

On 19 September 2017, the Council of the European Union (EU) confirmed that Greece's excessive deficit had been corrected. This decision marked the end of the excessive deficit procedure (EDP) to which the country was subjected twice, for a total of 13 years. The implementation of the EDP took place, under the corrective arm of the Stability and Growth Pact, in response to the high and persistent four-decade public deficit and the resulting debt crisis. Delving into Greece's fiscal

outturn, we observe that the public sector deficit data depict spikes which tend to coincide with general elections. This pattern indicates that the public deficits that necessitated severe European sanctions may not have been the outcome solely of economic disturbances and accidental fiscal mismanagement. They could also have been the result of opportunism and political myopia, if Greek governments increased public deficits in an attempt to maximise their votes; thus, creating what is defined in the literature as political budget cycles (PBCs).

In this study, we examine the empirical evidence regarding the political cycles and public deficits in Greece during the years 1980–2017, to investigate the existence, magnitude, and determinants of PBCs. We focus on the Greek economy for two key reasons. Firstly, the aforementioned spikes in the deficit data hint towards the existence of severe PBCs. Secondly, the unprecedented thirteen-year duration of the EDP, from 2004–2007 and 2009–2017, makes the country a unique case for the statistical evaluation of the restrictive fiscal policies imposed by the EU. To identify PBCs, we propose a novel empirical model which is rich enough to allow for the examination of the effectiveness of the EDP in suppressing any opportunistic budgetary behaviour by the government of an EU member state (e.g., Ciommi et al. 2018). Therefore, to the best of our knowledge, this study is the first to examine the potential effectiveness of corrective fiscal policies imposed by European institutions, such as the EDP, in alleviating domestic political myopia and reducing PBCs. This challenge has been noted in the literature, but our dataset is the first to allow for its comprehensive and systematic analysis.

Our study is related to the models of PBCs which explore the effects of political cycles or election cycles on public expenditure, public revenue, and budget deficit. The central hypothesis of these models is that faced with a myopic electorate with a *decaying memory* of past events (Bonfiglioli–Gancia 2013), or taking advantage of *informational asymmetries* that exist between them and rational constituents (Rogoff–Sibert 1988, Rogoff 1990), incumbent politicians choose to maximise their *voting function* instead of the social welfare function (Nordhaus 1975). Consequently, governments often pursue opportunistic expansionary fiscal policies before elections to appear competent and offer voters an illusion of economic prosperity. This type of behaviour gives rise to the PBCs phenomenon.

To investigate the existence of politico-economic cycles (Salvati et al. 2016), we focus our analysis on PBCs arising from opportunistic cycles in fiscal policy. It suffices to study the use of fiscal policy because when analysing the economy of a member of the Eurozone such as Greece, we can take as given that its government is deprived of an independent monetary policy and that monetary instruments are controlled by the European Central Bank, which statutorily enjoys political independence, as do the national central banks in the Eurozone area.[1] PBCs

[1] See European Union (2012).

materialise through an increase in the budget deficits as opposed to political *business cycles* (Ciommi et al. 2017). According to the political business cycles literature, voters are concerned with unemployment, so politicians in power exploit the short-run Phillips curve just before elections, by increasing the rate of inflation, to reduce unemployment levels.[2] We shift our focus from the unemployment inflation tradeoff, since unemployment and inflation as economic policy objectives are not under the direct control of policymakers, while public deficits as economic policy means are under the direct control of governments (Chelli et al. 2016). Furthermore, policy means may be ineffective with reference to the policy objectives. In the presence of such ineffectiveness, the empirical analysis based on the inflation unemployment tradeoff might not reveal the actual intentions of opportunistic policymakers (Alesina et al. 1993, Dubois 2016, Gigliarano–Chelli 2016).

The ability of governments to create PBCs decreases with the increase in the level of economic and social development, quality of institutions, and transparency of political processes (de Haan–Klomp 2013). Hence, PBCs are evident in less developed economies (de Haan–Surm 1994, Brender–Drazen 2005, Shi–Svensson 2006) but appear to be negligible in developed countries, such as the member states of the EU (Andrikopoulos et al. 2004, Rosti–Chelli 2012, Mandon–Cazals 2019), where voters tend to punish this behaviour (Peltzman 1992).

According to this assumption, Greece presents an exception given that the country is characterised by weak institutions and an imperfect system of checks and balances (Afonso et al. 2015, Trantidis 2016) and that its governments have often been accused of clientelism and populism (Mitsopoulos–Pelagidis 2011, Costa–Ricciuti 2013, Christodoulakis 2019). However, past research is inconclusive regarding the existence of PBCs. Andrikopoulos et al. (2004) examined the years between 1970 and 1998 and found no evidence of a pre-electoral increase in public deficits. More recent works, however, have reported strong evidence indicating the existence of PBCs in Greece both at the national (de Haan–Klomp 2013) and the municipal level (Chortareas et al. 2016).[3] Our study complements the literature by analysing a sizeable recent dataset covering the post-2004 era (Castagnetti et al. 2005, Rosti–Chelli 2009, Chelli et al. 2009). The data enable us to examine how domestic politicians' opportunistic behaviour has evolved over time and how the imposition of fiscal rules as part of the EDP has shaped it, if at all.

Regarding the importance of the Stability and Growth Pact's EDP, we are the first to examine its role and explicitly allow for the procedure to influence the severity of PBCs. This part of our study contributes to the literature that focuses on fiscal rules and their important yet nuanced impact on PBCs. Using a broad measure of fiscal rules, Gootjes et al. (2019) found that since the global financial crisis

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[2] For a review of the transition from the political business cycle to PBC see Efthyvoulou (2012).

[3] de Haan and Klomp (2013) use data from 1975–2005 and Chortareas et al. (2016) use a dataset that covers 1985–2004.

(Delbianco 2019), PBCs have only occurred in countries with weak fiscal rules, which implies that, in the case of countries subject to the EDP, such as Greece, we should expect that elections do not affect fiscal policy. Finally, although examining the importance of the EDP was not possible in other datasets, there are previous studies which focused on the Stability and Growth Pact and found that it does not affect politically motivated fiscal policy (Mink–de Haan 2006, Efthyvoulou 2012).

The rest of this paper is organised as follows: first we present our data and methodology. Thereafter we discuss our findings and contributions to the literature, and finally we present the conclusions.

Materials and Methods

To investigate the existence of PBCs in Greece, we adopted an empirical approach based upon annual administrative data from 1980 to 2017, following the standard PBCs literature (Shi–Svenson 2006, Veiga–Veiga 2007, Sakurai–Menezes-Filho 2011, Chortareas et al. 2016). We define five variables:

a) The *actual budget balance (ABB)* (plus (+) sign corresponding to a public deficit as a rule) as a percentage of gross domestic product (GDP), as defined by Eurostat. The ABB captures the total effects of fiscal policies on electoral periods, that is, the effects of both the revenue (reduction of taxes) and expenditure side (increase in government spending). We consider the public balance as a percentage of GDP and not in absolute monetary terms (millions of euros) for three reasons: First, the percentage expression provides a more reliable indicator of the relative magnitude of public balance. Second, the percentage term removes the long-term effect of inflation on fiscal aggregates. Third, the basic fiscal policy objective of the EU member states is to avoid entering the EDP; the EDP is launched when a member state has breached or is at risk of breaching the percentage criterion of 3% of GDP.

b) The *one-year lag of the ABB (ABB-1)* as a percentage of GDP, since the public balance is compounded in the sense that the budget deficit of the previous year affects, to some extent, the deficit of the current year. In effect, the one-year lag of the dependent variable as a percentage of GDP is used to allow for any existing slow adjustment process and persistence of the ABB, capturing the autoregressive, AR(1) component of the ABB time series.

c) The *growth rate of real (total or per capita) GDP* since declining growth (either total or per capita) may put additional pressures on incumbent politicians to increase public deficit before elections.

d) *Elections*, as a dichotomous measure (variable) taking the value of 1 in the years of general elections in Greece and 0 otherwise.

e) We complement the existing research by introducing the additional variable *EDP*, which is another dichotomous measure taking the value of 1 in the

years during which Greece was under the EDP and 0 otherwise. Hence, this measure takes the value of 1 during the years 2004–2007 and 2009–2017.

Let y_i denote the observed annual value of the ABB, considered as the response variable on the ith time segment ($i = 1,2,…,37$), covering the period between 1981 and 2017. Furthermore, let $x_{1i} = y_{i-1}$ denote the observed value of the one-year lag of the ABB variable X_1, and x_{2i} denote the value of X_2, corresponding to the total (Model 1) or per capita (Model 2) GDP growth rate variable. Additionally, let z_{ki}, and $k = 1,2$, denote the observed value of the dichotomous variables for an election (Z_1) and EDP (Z_2), respectively. We assume that the mean of the response variable can be modelled as a linear combination of both the quantitative and dichotomous variables (Chelli–Rosti 2002) in the following way:

$$E(y_i) = \beta_0 + \sum_{j=1}^{2} \beta_j x_{ji} + \sum_{j=1}^{2} \gamma_j z_{ji} \qquad (1)$$

However, the fiscal deficit is influenced by the economic cycle. During periods of economic slowdown, public deficits tend to rise as public expenditures increase, especially social transfers, and public revenues shrink. On the contrary, during periods of economic expansion, public deficits tend to shrink as public expenditures decline and public revenues increase. It is, therefore, necessary to isolate the effects of the economic cycle from the impact of the political cycle. To focus on the political cycle, we add to the existing literature by using the *cyclically adjusted budget balance (CABB)* as a percentage of potential gross domestic product (GDP), as defined and measured by Eurostat,[4] to differentiate between economic and political cyclicality. The methodology used by Eurostat to calculate the CABB is generally accepted, and hence our calculations do not suffer from the disadvantage highlighted by Mink and de Haan (2006) that there is no consensus on how cyclically adjusted data should be computed. However, while our data on ABB cover the period 1980–2017, the data on CABB cover the 1988–2017 period only. The reduced number of observations imposes additional limits on our statistical analysis given that we use annual data, since quarterly budget data on deficits in Greece exist only after 1999, and general elections take place on a particular day of the year.[5]

We fit the model with the CABB as the response variable. Let y_t^s ($t = 1,2,…,29$) denote the observed value of the response variable covering the period between 1989 and 2017. We consider the same independent variables as in the previous section except for GDP. We use two alternative definitions of GDP, namely the *observed absolute value of (total or per capita) GDP* and the *growth rate of real (total or per capita) GDP*, as above[6]. We obtain the model:

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[4] For a detailed analysis of the methodology used to calculate the CABB in the EU see Mourre et al. (2013).

[5] This shortcoming of annual data has been highlighted by Berger and Woitek (1997).

[6] We do this to tackle our limited observations problem as it is discussed below.

$$E(y_t^s) = \beta_0 + \sum_{j=1}^{2} \beta_j x_{jt}^s + \sum_{j=1}^{2} \gamma_j z_{jt} \qquad (2)$$

where $x_{1t}^s = y_{t-1}^s$ denotes the observed value of the one-year lag of the CABB. x_{2t}^s denotes the value of the GDP growth rate (total (Model 3) or per capita (Model 4)) or the observed value of the GDP (total (Model 5) or per capita (Model 6)). As above, z_{kt} and $k = 1,2$, denote the observed values of the election (Z_1) and EDP (Z_2) dummies, respectively.

We apply Ordinary Least Square estimation to the available datasets. The time series used to model ABB is 1981–2017, whereas for CABB it is 1989–2018, where the inclusion of 2018 is the result of fitting a curve on the existing data of CABB to predict the value of an additional year, thus increasing the available dataset.[7]

Results and Discussion

We start by documenting the three fundamental empirical regularities motivating our analysis. Figure 1 presents the evolution of Greek ABB as a percentage of GDP during the years 1980–2017, CABB as a percentage of GDP during 1988–2017, and the years of general elections. First, Figure 1 shows that large and persistent public deficits have characterised the Greek economy for almost 40 years. The persistence of the public deficit time series, as well as the fact that it lies consistently above 3% of GDP, have been documented by Eurostat. According to Eurostat, public deficits in Greece are consistently higher than the Eurozone average, except for the last three years leading to 2019. These high deficits mostly led to the debt crisis problem that devastated the Greek economy over the last decade, costing the country more than one-fourth of its GDP per capita (Vavouras–Vavoura 2019). The debt crisis was dealt with through the corrective arm of the Stability and Growth Pact. The Pact is a set of rules designed to ensure that countries in the EU pursue sound public finances and coordinate their fiscal policies. The corrective arm, in particular, tries to ensure that the member states of the EU adopt appropriate policy responses to correct excessive deficits by implementing the EDP. The EDP involves sanctions that can be imposed on member states that do not take the appropriate measures to correct their excessive deficits. These sanctions are extremely severe and could be extended to fines, imposed by the Commission, amounting to 0.5% of GDP.[8] The EDP is launched when a member state has breached or is at risk of breaching the

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[7] We find that the cubic function fits well on CABB time series. The cubic function gives $R^2 = 0.756$. The exact equation used to predict the value of CABB for the year 2018 is the following:

CABB = 7.619 + 0.093t + 0.045t² - 0.004t³, where t is the time variable.

[8] The EDP is outlined in detail under the Article 126 of the Treaty on the Functioning of the European Union (2012). The Council Regulation (1997) deals with the speeding up and clarification of the implementation of the EDP.

public deficit threshold of 3% of GDP.[9] Of all EU members, Greece has been subjected to the EDP for the longest time, between 19 May 2004 and 5 June 2007 and between 18 February 2009 and 19 September 2017, thus providing enough annual data to analyse the effectiveness of the procedure.

Figure 1

Actual budget balance and ciclically adjusted balance in Greece
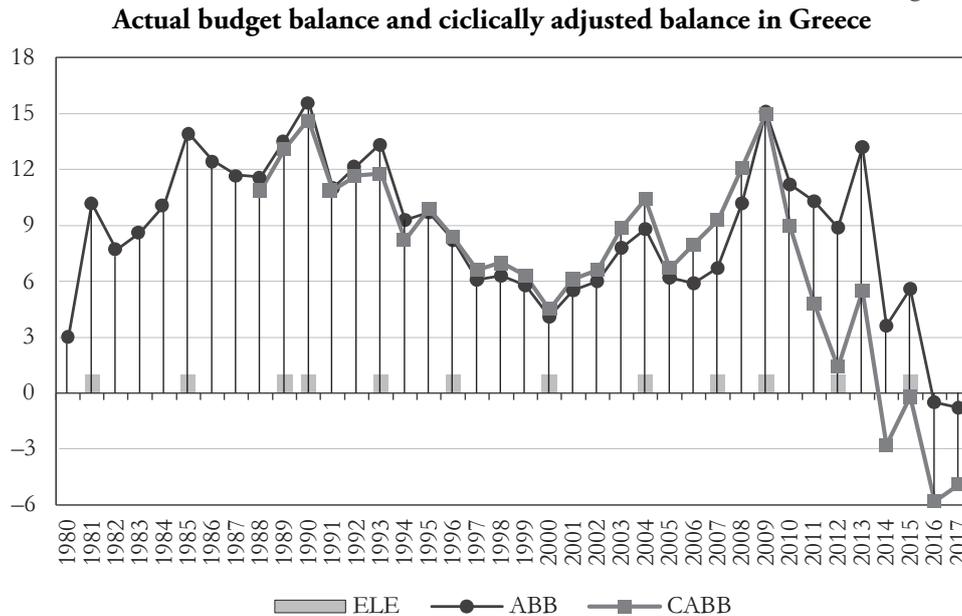
Notes: ELE = year of general elections, ABB = actual budget balance as % of GDP, CABB = cyclically adjusted balance as % of potential GDP. The minus (–) sign implies a surplus.
Source: Eurostat, Government revenue, expenditure, and main aggregates.

Second, in Figure 1, we highlight the years of general elections during the period 1980–2017 and illustrate that the election years 1981, 1985, 1989, 1990, 1993, 2004, 2009, and 2015 coincide with spikes in the levels of public deficit as a percentage of GDP. This is an indication that, at least during the 1980s and up until the mid-1990s, PBCs likely existed in Greece. From the mid-1990s on, there are four election years (1996, 2000, 2007 and 2012) without a spike in the public deficit. These election years occur during periods when the country was following fiscal policy rules either to comply with the fiscal criteria for joining the Economic and Monetary Union or the fiscal rules imposed by European institutions. More specifically, the 1996 and 2000 elections took place when the Greek economy was expected to meet the criteria for joining the monetary union, the so-called *Maastricht convergence criteria* and, mainly, the budgetary discipline criterion; the 2007 and 2012

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[9] The EDP could also be launched when a member state violates a second threshold which is when the public debt exceeds 60% of GDP. However, until now, the EDP has only been imposed to member states according to the public deficit criterion.

elections occurred during the time that Greece was under the EDP. Our main contribution is to explore whether EU-imposed fiscal measures limit the ability of Greek governments to create PBCs by explicitly testing for the success of the EDP in dealing with domestic PBCs. We focus on the EDP, as it is a well-defined thirteen-year span in which Greece was subjected to fiscal adjustment rules, imposed mainly, by European institutions, allowing for a robust empirical analysis. However, our results could be generalised to other fiscal policies suggested by the EU.

Third, we observe that incumbent governments tend to resort to pre-electoral increases in public deficit regardless of their political orientation, and these increases do not appear to critically shape the election results. More specifically, of the 15 elections that took place between 1980 and 2017, the centre-right party (New Democracy) won seven times, for four of which it was the incumbent, the social-democratic party (PASOK) won six, for three of which it was the incumbent, and the left-wing party (SYRIZA) won twice and was the incumbent once[10]. Hence, the political orientation of the incumbent does not seem to be relevant when it comes to the pre-electoral increase of public deficit, hinting at the existence of electoral cycles and not partisan cycles (Andrikopoulos et al. 2004, Lockwood et al. 2001). Moreover, there is inconclusive evidence regarding the effect of the abovementioned increases on the re-election chances of the incumbent government. This observation is consistent with Brender and Drazen (2008), who argued that budget deficits could even reduce the possibilities of incumbents being re-elected since the electorate tends to punish politicians who create fiscal deficits. However, there is no available data to quantify this hypothesis in the case of Greece, and its testing lies beyond the scope of this study. We go on to present the results from the analysis of our two empirical models.

Regressing independent variables on ABB

In Model 1, we use Equation (1) with ABB as the dependent variable and the growth rate of real total GDP as the independent variable measuring income. The model presents a very good overall goodness of fit as the $R^2 = 62.2\%$, while the F-test indicates absolute statistical significance ($F = 13.16$, $df = 4$, $p = 0.00$). The coefficients of the model are statistically significant and economically meaningful, as shown in Table 1.

[10] New Democracy won seven times (June 1989, November 1989, 1990, 2004, 2007, May 2012 and June 2012) for four of which it was the incumbent (November 1989, 1990, 2007 and June 2012), PASOK won six times (1981, 1985, 1993, 1996, 2000 and 2009), for three of which it was the incumbent (1985, 1996 and 2000), and SYRIZA won twice (March 2015 and December 2015) and was the incumbent once (December 2015).

Table 1

Regression coefficients estimation of Model 1

Variables	Coefficient	Standard error	p-value
Constant	4.099	1.433	0.007
ABB-1	0.570	0.126	0.000
EDP	–2.816	0.994	0.008
Election	2.657	0.893	0.006
GDP growth	–0.281	0.141	0.050

The economic intuition behind the results of Table 1 is that the political cycle is an essential determinant of the ABB. Thus, large PBCs exist in the Greek economy as public deficits increase, on average by 2.66% of GDP during election years. This result follows that of de Haan and Klomp (2013) for their national level analysis, and Chortareas et al. (2016) for their municipal level one, in documenting the existence of PBCs in Greece. Quantitatively, however, the magnitude of the cycles that we report is much higher than that estimated by de Haan and Klomp, which is lower than 1% of GDP. We find that PBCs are disproportionately high compared to other developed economies, which tend to have insignificant cycles that may vary anywhere below 1% of GDP. The value of the PBCs coefficient computed for the case of modern-day Greece indicates the socio-political characteristics of a developing economy rather than those of a developed one. Crucially, putting our results together with those of Andrikopoulos et al. (2004) who analysed the 1970–1998 period, and found no evidence of the existence of PBCs and de Haan and Klomp (2013) who reported small PBCs during 1975–2005, we conclude that, over time, the magnitude of PBCs in Greece seems to have increased exponentially.

Regarding the role of European institutions, we find that, in the presence of restrictive fiscal policies in line with the EDP, public deficits tend to decrease, on average, by 2.82% of GDP and thus the EDP effect marginally counterbalances the election effect. This result is new to the literature. It links to the idea that, in the presence of strict fiscal rules, election-motivated public deficit manipulations tend to disappear (Gootjes et al. 2019). However, previous research on the Stability and Growth Pact did not establish a link between the Pact and PBCs (Mink–de Haan 2006, Efthyvoulou 2012). Focusing on the EDP instead, we find that the EDP-created decrease in deficits marginally outweighs the PBCs-related increase. This finding is susceptible to double interpretation: EU-imposed measures limit domestic political myopia. Concurrently, the effects of the fiscal adjustment policies that have been imposed on Greece by its European counterparts, and associated with major economic and social consequences (such as high unemployment, a drastic reduction in real incomes), only cancel out the increases in public deficits caused by PBCs. In other words, austerity brought about by the EDP was the price the electorate had to pay for the consequences of its and the government's myopic behaviour. Analysing

the remaining explanatory variables, we find that public deficit adjusts slowly, as it is strongly influenced by its one-year lagged value, and it is negatively correlated with the GDP growth rate. One way to understand this negative correlation is that, during periods of economic slowdown, corresponding to decreasing growth rates, governments tend to respond with expansionary fiscal policies.

Finally, we show that all the methodological assumptions for Model 1 hold. In particular, the classical assumptions of the linear regression model are shown to be true. The Durbin-Watson test does not indicate positive or negative autocorrelation ($d = 2.143 > d_L = 1.06$ and $4\text{-}d = 1.857 > d_U = 1.51$). Collinearity diagnostics indicate no serious multicollinearity since tolerance statistics are high (0.832, 0.766, 0.987 and 0.717 for the variables ABB-1, EDP, election and GDP growth, respectively) and Variance Inflation Factor (VIF) is low (1.202, 1.305, 1.013 and 1.394 for the variables ABB-1, EDP, election and GDP Growth, respectively). Also, the value of the conditional index is low (CI = 7.519 < 15) indicating no serious multicollinearity, although the Eigenvalue is near 0 indicating some small collinearity problems due to ABB-1 contributing a large proportion of the variance. Regarding the normality assumption, studentised deleted residuals seem to follow the normal distribution. The homoscedasticity assumption also holds (see the Appendix).

Model 2 again uses Equation (1) with ABB as the response variable but includes GDP per capita growth as an independent variable instead of the GDP growth that we used in Model 1. This model performs slightly better than Model 1 because the GDP per capita growth rate also accounts for population growth. However, the two models are very similar in the case of Greece, given the country's low population increase over time. The overall goodness of fit of Model 2 is $R^2 = 62.8\%$, while the F-test indicates absolute statistical significance ($F = 13.484$, $df = 4$, $p = 0.00$). The coefficients, presented in Table 2, are also statistically significant, and their economic interpretation is similar. Public deficits appear to be strongly positively correlated to their one-year lagged value and negatively correlated to the per capita GDP growth rate. Most crucially, elections induce a significant increase in Greek public deficits, on average equal to 2.68% of GDP, meaning that regardless of the GDP growth rate measure that we use, we still get our main result, which is the strong correlation between the stage of the political cycle and the level of public deficit. In terms of the impact of EU institutions, the presence of the EDP decreases public deficits by 2.82% of GDP on average. This EDP effect marginally overturns the politically-motivated effect.

Table 2

Regression coefficient of Model 2

Variables	Coefficient	Standard error	p-value
Constant	4.065	1.394	0.006
ABB-1	0.560	0.126	0.000
EDP	−2.681	0.949	0.008
Election	2.635	0.887	0.006
GDP pc growth	−0.299	0.140	0.041

Regarding the various diagnostic tests performed on the model, we find that it does not suffer from positive or negative autocorrelation ($d = 2.167 > d_L = 1.06$ and $4\text{-}d = 1.833 > d_U = 1.51$). There is no indication of serious multicollinearity (high tolerance statistics equal to 0.823, 0.828, 0.986, and 0.757 and low VIF equal to 1.215, 1.208, 1.014, and 1.322 for the variables ABB-1, EDP, election and GDP pc Growth, respectively). Additionally, CI = 7.417 < 15 also implies no serious multicollinearity despite the Eigenvalue being close to 0 as a result of ABB-1 largely driving the variance. The homoscedasticity assumption holds, and the studentised deleted residuals follow the normal distribution (see Appendix). For completeness, we examine the interaction of the EDP and the election variable by adding an interaction term in Model 1 and Model 2. We find that the interaction term is not statistically significant (its p-value equals 0.419 in Model 1 and 0.393 in Model 2) and hence its inclusion lowers the models' goodness of fit given that, in the presence of the interaction term, $R^2 = 0.63$ and adjusted $R^2 = 0.57$ for Model 1 and $R^2 = 0.64$ and adjusted $R^2 = 0.59$ for Model 2 (see Appendix).

Regressing independent variables on CABB

Fitting the four alternative models on CABB, we obtain the results shown in Table 3. Examining these models, we find that they present much higher goodness of fit than ABB, as R^2 is between 0.77 and 0.80. However, in Model 3 and Model 4, which include the total and per capita GDP growth rate, respectively, the coefficients of the EDP and the GDP growth rate present no statistical significance, while the coefficient of the election variable presents no clear statistical significance (p-values are 0.081 and 0.084). Model 5 and Model 6, including total and per capita GDP, respectively, have a better performance as both dummy variables are statistically significant. Notice that the constant term in these models is negative, implying a public surplus when we remove the impact of the economic cycle. The GDP (total and per capita) present no clear significance ($p = 0.073$ and $p = 0.061$).

Table 3

Regression coefficients estimation of Models 3–6

Variables	Model 3	Model 4	Model 5	Model 6
Constant	n.s.	n.s.	−6.241 (0.10)	−7.446 (0.08)
ABB-1	0.899 (0.00)	0.909 (0.00)	0.848 (0.00)	0.846 (0.00)
EDP	n.s.	n.s.	−3.037 (0.029)	−2.984 (0.028)
Election	2.152 (0.081)	2.139 (0.084)	2.442 (0.043)	2.4 (0.044)
GDP growth	n.s.			
GDP pc growth		n.s.		
GDP			0.000037 (0.073)	
GDP pc				0.474 (0.061)
R²	**0.775**	**0.774**	**0.80**	**0.80**

Note: The p-values in brackets.

Hence, although Model 5 and Model 6 perform better than Model 3 and Model 4, statistical problems are still present. The fact that the number of CABB values available is relatively small (equal to 30), compared to the values of ABB used (equal to 37), considerably harms the performance of the models with CABB. Nevertheless, the sign of the election and EDP coefficients indicates that future research using a larger dataset of CABB values, instead of ABB, will likely yield qualitatively similar results. This is illustrated in Figure 1, where, considering the time series of the two response variables, we detect a significant correlation between the ABB and the CABB.[11] To sum up, on the one hand, deficits in the Greek economy increase exponentially during election years, thus creating PBCs. On the other hand, the imposition of sanctions as part of the EDP forces Greek politicians to limit their political myopia and suppress public deficits. Whether the latter effect is larger than the former in this specification of our study is unclear at this point, given the lack of statistical significance for the election and EDP coefficients.

[11] Pearson r = 0.83 with p-value = 0.00 and Spearman ϱ = 0.79 with p-value = 0.00.

Conclusions

Based on our empirical analysis of the Greek economy, we find that PBCs have existed for the past 40 years, and have been of greater magnitude compared to those of other developed economies and other prior Greek estimates. The existence of large PBCs constitutes an essential indication that Greece has certain socio-political characteristics of a developing economy, including low-quality political institutions and weak political checks and balances (Gavalas et al. 2014, Rontos et al. 2016, Salvati 2016, Salvati et al. 2017, Di Feliciantonio et al. 2018). Furthermore, our observation that the ideological orientation of the incumbent government is irrelevant when it comes to the formation of PBCs implies that political parties in power have resorted to myopic behaviour independently of their political affiliations; therefore, PBCs could be described as a structural phenomenon of the Greek economy and, as such, one that is difficult to tackle (Lamonica et al. 2020). Having established the existence of PBCs, we explored the role of the EU. Our study contributes to the literature by exploring the effectiveness of the EDP in alleviating pre-electoral fiscal policy manipulations. We conclude that the imposition of the EDP has significantly reduced the PBCs phenomenon in Greece, to the point of elimination. We also try to isolate the effects of the economic cycle from the political cycle by using the notion of the cyclically-adjusted balance (Lamonica–Chelli 2018); there was no consensus on how this notion should be computed, until recently. Therefore, there is limited information on its evolution. For future research, we believe that analysing larger datasets of CABBs should be a priority (Salvati et al. 2019). Finally, given the significant magnitude of PBCs that we estimated in Greece, including additional socio-political explanatory variables (e.g. Ciommi et al. 2019), such as media strength, in line with the work of Ademmer and Dreher (2016), could offer valuable insight into the mechanism of PBC generation.

Appendix

Figures 2 and 3 are the scatterplots corresponding to Model 1 and Model 2, respectively, indicating homoscedasticity. Tables 4 and 5 show that the normality assumption is confirmed for Model 1, whereas Tables 6 and 7 show that normality holds for Model 2.
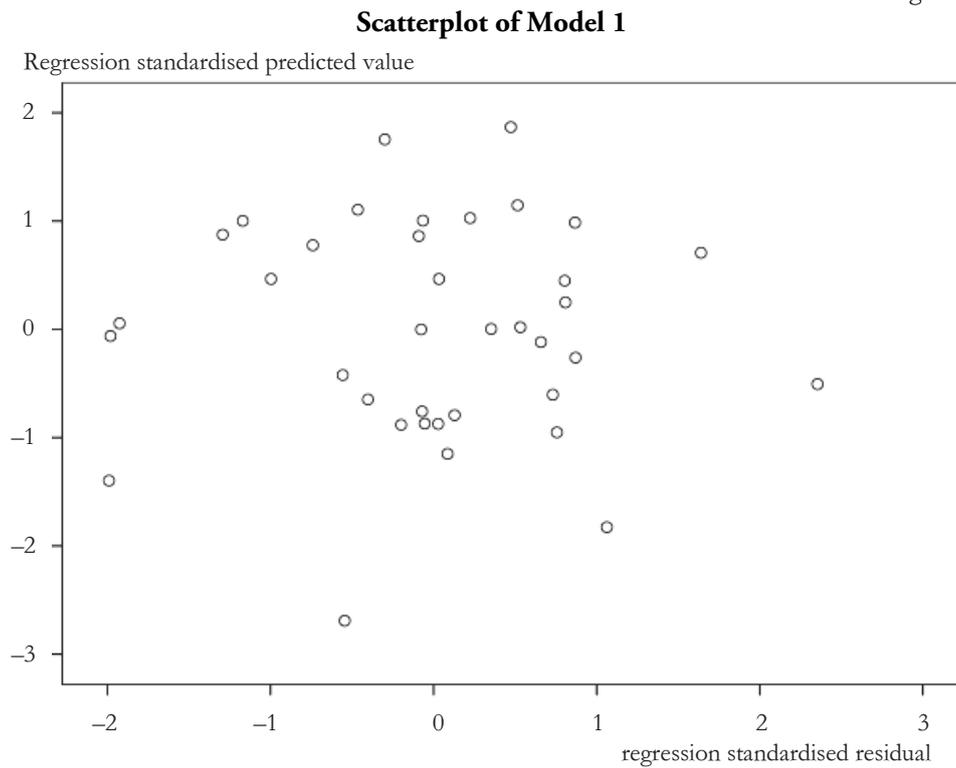
Figure 2

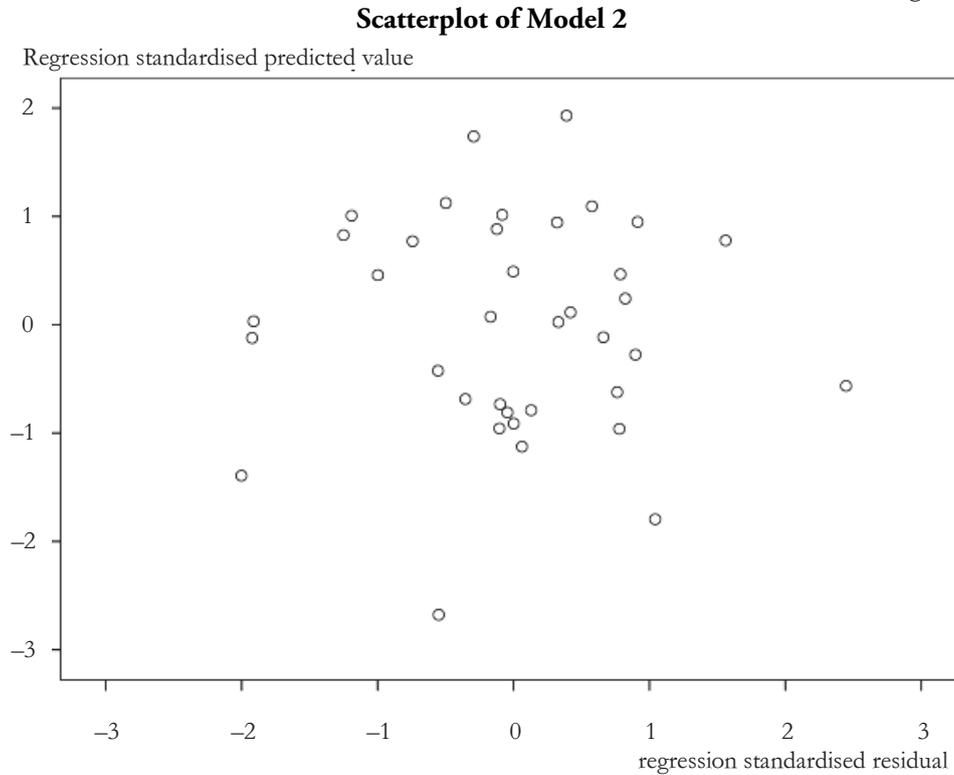**Scatterplot of Model 1**

Regression standardised predicted value

regression standardised residual

Figure 3

Scatterplot of Model 2

Regression standardised predicted value

regression standardised residual

Table 4

Descriptives of Model 1

Studentised deleted residual		Statistic	Standard error
Mean		–0.0049183	0.17401263
95% Confidence interval for mean	Upper bound	–0.3578322	
	Lower bound	0.3479957	
5% Trimmed mean		–0.0074062	
Median		0.0296072	
Variance		1.120	
Standard deviation		1.05847753	
Minimum		–2.33678	
Maximum		2.73561	
Range		5.07239	
Interquartile range		1.26906	
Skewness		–0.198	0.388
Kurtosis		0.915	0.759

Table 5

Tests of normality of Model 1

	Kolmogorov–Smirnov			Shapiro–Wilk		
	Statistic	df	Sig.	Statistic	df	Sig
Studentised deleted residual	0.113	37	0.2	0.96	37	0.207

Table 6

Descriptives of Model 2

Studentised deleted residual		Statistic	Standard error
Mean		–0.0047651	0.1740322
95% Confidence interval for mean	Upper bound	–0.3578628	
	Lower bound	0.3483326	
5% Trimmed mean		–0.0101867	
Median		0.0026291	
Variance		1.122	
Standard deviation		1.05902855	
Minimum		–2.27221	
Maximum		2.85494	
Range		5.12716	
Interquartile range		1.29413	
Skewness		–0.119	0.388
Kurtosis		1.042	0.759

Table 7

Tests of normality of Model 2

	Kolmogorov–Smirnov			Shapiro–Wilk		
	Statistic	df	Sig.	Statistic	df	Sig
Studentised deleted residual	0.111	37	0.2	0.959	37	0.193

Table 8

Regression coefficients estimation of Model 1 with interaction

Variables	Coefficient	Standard error	p-value
Constant	4.234	1.450	0.006
ABB-1	0.575	0.127	0.000
EDP	–3.358	1.198	0.009
Election	2.076	1.144	0.079
GDP growth	–0.287	0.142	0.051
Election * EDP	1.517	1.851	0.419

Table 9

Regression coefficients estimation of Model 2 with interaction

Variables	Coefficient	Standard error	p-value
Constant	4.169	1.361	0.005
ABB-1	0.571	0.122	0.000
EDP	–3.267	1.135	0.007
Election	2.030	1.120	0.080
GDP pc growth	–32.2170	13.548	0.024
Election * EDP	1.569	1.813	0.393

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