

**The Causes Of Excessive Deficits In
The European Union**

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THE CAUSES OF EXCESSIVE DEFICITS IN THE EUROPEAN UNION

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Abstract

Several studies have identified the factors that cause public deficits in industrial democracies. They consider that economic, political and institutional factors play an important role in the understanding of those deficits. However, the study of the determinants of excessive deficits remains practically unexplored. Since excessive deficits can have large negative spillover effects when countries are forming a monetary union without a centralised budget – as it is the case for a group of European countries – this paper tries to explore that gap in the literature by identifying the main causes of excessive deficits and the ways of avoiding them.

Binary choice models are estimated over a panel of 15 European Union countries for the period 1970-2006, where an excessive deficit is defined as a deficit higher than 3% of GDP. Results show that a weak fiscal stance, low economic growth, the timing of parliamentary elections and majority left-wing governments are the main causes of excessive deficits in the EU countries. Moreover, the institutional constraints imposed after Maastricht over the EU countries' fiscal policy have succeeded in reducing the probability of excessive deficits in Europe, especially in small countries. Therefore, this study concludes that supranational fiscal constraints, national efforts to reduce public debts, growth promoting policies and mechanisms to avoid political opportunism and partisan effects are essential factors for an EU country to avoid excessive deficits. Finally, the results presented in this paper raise the idea that a good strategy for the EU countries to avoid excessive deficits caused by the opportunistic behaviour of their policymakers would be to schedule elections for the beginning or the end of the year.

Keywords: Excessive public deficits; European Union; Political opportunism; Binary choice models.

JEL classification: E62, H6, O52.

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1. Introduction

Since 1992 the European Union (EU) countries have been compelled to make efforts to actively control their public accounts and to converge in nominal terms. First, the Maastricht Treaty defined the budgetary rules – in addition to criteria for inflation reduction, interest rate convergence and exchange rate stability – that countries had to satisfy in order to take part in the Economic and Monetary Union (EMU): the 3% of GDP deficit rule and the 60% of GDP debt rule. Then, these same fiscal rules were reinforced in the Stability and Growth Pact (SGP) for countries in the EMU.

The main justification for using rules to limit the degree of fiscal policy discretion is the fact that governments seem to have an inherent propensity to run excessive deficits and debts. As politicians represent different groups of interest, they tend to demand expenditures in the interest of their supporters, resulting in excessive deficits. Moreover, policymakers are also concerned with their re-election. Therefore, an excessive deficit can result from the tendency to opportunistically manipulate the economy and to loosen fiscal policy before elections.

This problem can be even greater in a monetary union. In the case of the EMU formed by the EU countries, since there is no centralization of the national budgets to accommodate asymmetric shocks, countries would be able to pass some of the costs of a loose fiscal policy to the other members if no fiscal rules were implemented. This would generate higher deficits, growing debts and an increase in the interest rate in the Euro-zone, putting pressure on the common monetary policy framework and on price stability. In the limit, it could undermine the project of the monetary union. Thus, if it is important to avoid excessive deficits when a country is not integrated in a monetary union, it is even more important to avoid them when they are forming a monetary union.

Taking into account the problems that may arise from unbalanced public accounts for countries in an EMU, this study tries to find the reasons why EU countries sometimes run excessive deficits. One of the aims of this study is precisely to provide some guidelines for EU countries to avoid such behaviour in the future, especially for those that are in the Euro-zone.

The literature provides a plethora of interrelated economic and political causes for public deficits, but the particular study of the determinants of excessive deficits remains practically unexplored. Therefore, this paper intends to contribute to the literature with a deep analysis of the economic, political and institutional determinants

of an excessive public deficit and, in that way, help both to explain why EU countries are sometimes affected by excessive deficits and to clarify what conditions may help them to avoid such a situation in the future. As this study focuses its attention on the EU countries, it defines an excessive deficit as a deficit higher than 3% of GDP, in line with the legal concept established by the Maastricht Treaty.

The pertinence of this study comes precisely from the fact that in Europe, after Maastricht, the main reference for fiscal policy and, in particular, for the public deficit has been the 3% rule for the deficit. With the implementation of this rule by the EU authorities, the analysis of the conditionings of the so called “excessive deficits” has gained a special interest, consequently motivating the analysis provided in this paper.

Contrarily to the traditional literature on public deficits, this study estimates a model for a binary dependent variable (excessive deficit) instead of a model for a continuous variable (public deficit). This kind of analysis permits us to infer more directly the factors that may take an EU country to break the reference value for the public deficit. Another novelty is the inclusion of political variables in this kind of analysis. Political variables are often used in the study of public deficits but, to our knowledge, no other study has provided so far a detailed analysis of the political conditionings of excessive deficits. This paper makes that analysis controlling especially for opportunistic and partisan effects and political fragmentation. Finally, this study also focuses its attention on the effects of the constraints imposed after Maastricht over budgetary behaviour, considering a separate analysis for large and small EU countries. This analysis is important because the EU rule for the deficit is certainly affecting the way fiscal policy has been conducted by some EU governments.

Using a binary choice model over a sample of 15 EU countries for the period 1970-2006, this paper provides evidence that a weak fiscal stance, low economic growth, parliamentary elections and majority left-wing governments are important causes of excessive deficits in Europe. Moreover, the institutional constraints imposed after Maastricht over EU countries’ fiscal policy have been important in reducing the probability of excessive deficits in the EU, especially in small countries. Therefore, supranational fiscal constraints, growth promoting policies and mechanisms to avoid political opportunism and partisan effects are essential factors for an EU country to avoid excessive deficits. This study also raises the idea that a good strategy for the EU countries to avoid excessive deficits caused by the opportunistic behaviour of their policymakers would be to schedule elections for the beginning or the end of the year.

The remainder of this paper is organized as follows. Section 2 presents a review of the literature on the causes of public deficits. Section 3 starts by describing the data and the main variables used in the estimation of the factors that influence the probability of an EU country being affected by an excessive deficit; then, the empirical model to be estimated in this study is presented. The empirical results on the economic, political and institutional determinants of an excessive deficit are analysed in Section 4. Finally, Section 5 provides a conclusion with the main findings of this paper and some guidelines for future research.

2. Literature

Several studies have been written to identify the factors that influence public deficits (and debts) in both OECD countries and EU countries over the last decades. Their results are essentially derived from the estimation of panel data models by using both fixed effects and pooled ordinary least squares estimators, and the lag of the dependent variable is often included as an additional regressor. Those studies conclude that economic and political factors play an important role in explaining public deficits in industrial democracies.

The literature on the economic and political determinants of public deficits is reviewed in the first part of this section. The second part will be dedicated to the presentation of the few existing studies on the determinants of excessive deficits.

2.1. Literature on the causes of public deficits

The literature on fiscal policy considers that economic variables play an important role in explaining public deficits. These deficits are usually characterised by some degree of persistence and are highly affected by the amount of public debt and by economic performance.

Regarding the persistence of the deficit, authors agree that the higher and more persistent is the public deficit, the more difficult will be for a country to change that tendency and to generate structural surpluses to avoid a high debt in the future. They usually capture this persistence including the lag of the dependent variable (government budget surplus or change in public debt) as an additional regressor in their equations.

The public debt is considered another important determinant of the deficit. Balassone and Francese (2004) and Mink and de Haan (2005) argue that it may have a

negative impact on the fiscal balance. A higher debt ratio causes an automatic increase in interest payments, which may result in a worsening of the fiscal balance. On the contrary, others authors support the idea that a high debt forces the government to take measures to reduce the deficit and, consequently, this will generate an effective reduction of the deficit.¹ Hence, there is no broad consensus in the literature about the overall effect of the debt ratio on the public deficit.²

In terms of macroeconomic conditions, studies are unanimous in concluding that the public deficit decreases when the economy is growing faster or when growth is above its potential or even when the unemployment rate is low. These variables affect the deficit mainly via the automatic stabilizers, i.e. through changes in tax revenues and transfers related to unemployment expenditures.

Another important determinant of public deficits is the interest rate. Several studies show that a high interest rate has a negative impact on the public deficit, a result that is justified by the increase in interest expenditure on public debt.

Some authors include the inflation rate in their analyses. For example, Perotti and Kontopoulos (2002) and Tujula and Wolswijk (2004) consider that it may directly affect government revenues and expenditures which are partially indexed in nominal terms. It may also put pressure on the interest rate and have a negative effect on investment and economic growth. On the contrary, others argue that inflation can have a positive effect on the public deficit, since it erodes the real value of the public debt. Therefore, the impact of this variable on the debt is not very clear.³

Political factors like elections, ideological orientation of the government, fragmentation and type of government are considered in this literature another important group of determinants of public deficits. The reason for considering political factors on the analysis of public deficits is originally related to the thoughts of the literature on

¹ This effect is more common in studies that use the primary deficit as dependent variable, like for example, Mélitz (2000) and Annett (2006). Furthermore, using a quadratic formulation, Mélitz (2000) shows that this latter effect is stronger than the former when the debt is (very) high. Empirical evidence provided by Annett (2002) for 19 OECD countries shows that countries tend to make an effort to improve their budget balances especially when the public debt is sufficiently high.

² Another group of authors argue that a good assessment of a country's public finances requires a disaggregated analysis of its government budget. Perotti *et al.* (1998), Annett (2002) and Perotti and Kontopoulos (2002) show that the loss of control over the budget is largely due to increases in public expenditures. Their results indicate that to regain control over the deficit, governments should cut their expenditures on some specific items such as transfers, subsidies and wages.

³ Considering a sample of 19 OECD countries, Perotti and Kontopoulos (2002) find that the higher is the inflation rate the lower will be the deficit, but Tujula and Wolswijk (2004) find no significant effect of inflation on public deficits in a panel of 22 OECD countries.

political business cycles (PBC).⁴ This literature followed two approaches. The first approach – introduced by Nordhaus (1975) and Lindbeck (1976) – stresses that policymakers have a natural motivation to opportunistically manipulate the economy before elections as a way of increasing their probability of re-election. This behaviour is rewarded by the voters because the election takes place in a period of economic expansion and, as the model assumes that they form expectations adaptatively, they are not able to predict this opportunistic behaviour. The second approach – a ‘partisan’ approach developed by Hibbs (1977) – emphasizes that politicians, when in office, take decisions according to their political ideology. In particular, right-wing parties are more concerned with inflation than unemployment, whilst left-wing parties are more prone to promote economic growth and to fight unemployment than to stabilize inflation.

These models were updated in the 1980s with the incorporation in their assumptions of rational expectations. According to this reformulation, voters’ rationality limits the opportunistic behaviour making the political cycles shorter, less intense and less regular than in the Nordhaus-Lindbeck model.⁵ On the partisan side, Alesina (1987) shows that rational expectations restrict the partisan effects to the post-electoral period. Moreover, this model confirms the traditional partisan idea that inflation (unemployment) will be higher (lower) when a left-wing party is in office.

To detect electoral fiscal cycles in the analysis of public deficit, some authors include in their equations a dummy for the election years as suggested by the PBC literature. The idea behind the inclusion of this variable is that just before elections policymakers may spend more and reduce taxes to increase their probability of re-election. Therefore, a higher deficit is expected in the election years.⁶ Tujula and Wolswijk (2004) and Annett (2006) show that elections lead to higher deficits in the EU countries, but their empirical evidence indicates a decline of the electoral opportunism under the (rules-based) Maastricht and SGP periods. In a descriptive analysis for the 11 EMU countries over the period 1999-2002, Buti and van den Noord (2003) present some evidence that governments tend to run a loose fiscal policy in pre- and election years, but in non-election years they tend to restrain their fiscal policy to attain safer budgetary positions, sufficiently far from the 3% of GDP deficit ceiling, in line with the

⁴ For a review of the literature on the political cycles see, for example, Alesina *et al.* (1997).

⁵ One important contribution for the rational opportunist models literature was Rogoff and Sibert (1988).

⁶ Shi and Svensson (2002) confirm this idea in a group of 91 developed and developing countries over the period 1975-1995.

requirements of the SGP. A similar result is reached by Mink and de Haan (2005) using a multivariate model over the period 1999-2004.

According to the partisan theory, left-wing governments have traditionally promoted a higher degree of public intervention in the economy. Hence, they should be more prone to increase expenditures and to generate deficits than right-wing parties. Several authors present evidence supporting this view.⁷

Besides taking into account opportunistic and partisan effects, some studies stress the role of political fragmentation in their analyses of the determinants of public deficits. Economists generally claim that minority governments, governments formed by multiple parties and governments characterized by a short tenure in office tend to run larger fiscal deficits. In a seminal paper in the field, Roubini and Sachs (1989) demonstrate that deficits are more common in industrial democracies when many political parties are present in a ruling coalition. However, in their analysis, they do not make a clear distinction between majority/minority governments and single-party/multi-party governments. This is a problem that weakens their conclusions, as is noticed by, for example, Edin and Ohlsson (1991), Borrelli and Royed (1995), Sakamoto (2001) and Perotti and Kontopoulos (2002). Therefore, these authors try to address this problem by analysing those two aspects of the political system separately.

The degree of political support that a government enjoys in the parliament is important when unpopular measures like spending cuts or tax increases need to be taken. Minority governments usually cannot take these measures without support from other parties in the parliament. When that support is not obtained those measures have to be postponed and high deficits arise. Deficits may also result from concessions to the other parties to get their support. This is not the case when a majority party is in office because it can pursue its policies without asking for support from other parties. However, empirical evidence on the effects of a majority/minority government on public deficits is mixed. Some authors like, for example, Edin and Ohlsson (1991), Volkerink and de Haan (2001) and Perotti and Kontopoulos (2002) find evidence suggesting that minority governments are more prone to generate deficits than majority governments. Others like de Haan and Sturm (1994), de Haan *et al.* (1999) and Woo

⁷ See for example, de Haan and Sturm (1994), Borrelli and Royed (1995), Perotti and Kontopoulos (2002), Sapir and Sekkat (2002) and Mink and de Haan (2005). Moreover, Sakamoto (2001) shows that left-wing governments tend to run larger deficits when unemployment is high.

(2003) find no evidence supporting this idea for EU, OECD or developing countries.⁸ Borrelli and Royed (1995), Sakamoto (2001) and Tujula and Wolswijk (2004) show that deficits can be lower under minority governments. The justification for this evidence rests on the same ground as the opposite result: as majority governments are able to take unpopular measures to reduce the deficit without needing support from other parties in the parliament, they are also better able to increase deficits than minority governments if they intend to do that.

De Haan *et al.* (1999) and Perotti and Kontopoulos (2002) consider that the distinction between minority and majority may not necessarily capture the notion of fragmentation in decision-making. As a consequence, they emphasize the importance of the number of decision-makers in the government. In fact, some authors believe that the fragmentation of the government is a more important source of public deficits. Roubini and Sachs (1989), Perotti *et al.* (1998), de Haan *et al.* (1999), Annett (2002) and Perotti and Kontopoulos (2002) show that public spending and deficits are higher when coalition governments are in office, that is, when the number of parties in the government is high. These authors argue that coalition governments have a bias towards larger deficits because when multiple parties participate in a coalition they are representing different interests, and to maintain the coalition it is necessary to accommodate those interests by satisfying their budgetary needs. Consequently, as coalition governments have more veto points within their structure and each party can demand expenditures, without fully internalizing their costs, it will be more difficult to apply spending cuts and to control the deficit when necessary.⁹ However, Edin and Ohlsson (1991) and Sakamoto (2001) found no evidence that the number of parties in office affects negatively governments' ability to reduce deficits.

The tenure in office or political instability – sometimes called fragmentation over time – is also considered by some authors as another determinant of public deficits. Grilli *et al.* (1991), de Haan and Sturm (1994) and Annett (2002) find that public deficits tend to be higher when government turnover is higher. Alesina and Tabellini (1987) have already emphasized that when political power alternates frequently between

⁸ In fact, they argue that "... minority governments are often able to reduce budget deficits, as the Danish experience demonstrates." (de Haan and Sturm, 1994, p. 164).

⁹ Perotti *et al.* (1998), Perotti and Kontopoulos (2002) and Woo (2003) also consider the number of ministers as an important conditioning of public deficits. They show that a large cabinet tends to generate more spending, especially in situations of economic slowdown or fiscal distress.

competing parties, the higher will be the deficit and debt bias. However, Borrelli and Royed (1995) and Sakamoto (2001) find no evidence to support this view.¹⁰

Some institutional factors are also considered important determinants of public deficits. Hallerberg and von Hagen (1997), Perotti *et al.* (1998) and Annett (2006) provide some evidence supporting the idea that the delegation of significant budgetary power to a 'strong' finance minister and contracts focusing on spending and deficit targets may help governments to maintain sustainable public finances. However, Perotti and Kontopoulos (2002) find no evidence of these effects on public deficits and justify this by the fact that those budgetary procedures are nearly time invariant. Grilli *et al.* (1991), Hallerberg and von Hagen (1997) and Annett (2002) argue that industrial democracies with proportional representation electoral systems are more prone to generate higher deficits and debts than countries with less fragmented institutions.

Finally, regarding the effects of the fiscal constraints imposed over the EU countries after 1992, Tujula and Wolswijk (2004) and Annett (2006) find some evidence that the run-up to EMU induced additional fiscal consolidation in Europe, but that additional fiscal discipline seems to decrease after that period.

2.2. Literature on the determinants of excessive deficits

While the literature on public deficits and debts is abundant, the literature on the causes of excessive deficits is relatively undeveloped. There are only a few studies that really try to analyse some issues related to excessive deficits in the European Union context: Bayar (2001), Hughes-Hallett and McAdam (2003) and Hughes-Hallett and Lewis (2004, 2005). These studies define an excessive deficit as a deficit higher than 3% of GDP, in line with the legal concept established by the Maastricht Treaty. Bayar (2001) focuses his analysis on the economic determinants of an EU country entering into and exiting from an excessive deficit, whilst Hughes-Hallett and Lewis (2004, 2005) are more concerned with the issue of whether the fiscal improvements created in the run-up to EMU have lasted beyond the creation of the Euro-zone. In a different approach, Hughes-Hallett and McAdam (2003) examine how explicit deficit targets can be used to reduce the probability of excessive deficits.

¹⁰ In the face of all this mixed evidence, we can conclude that there is no consensus in the literature about the effect of political fragmentation on the public deficit. In a survey on this literature, Perotti (1998) has already noticed that the evidence on the effects of political fragmentation on the public deficit is rather inconclusive. He believes that this situation can be due to the use, in the several studies on this topic, of different samples, different measures of the deficit and different measures of political fragmentation.

Using a duration analysis over the period 1970-1996 for the 15 EU member states, Bayar (2001) concludes that government receipts and economic growth are important determinants for the likelihood of a country exiting from the state of an excessive deficit, whereas primary expenditures play a central role for the likelihood of a country's entry into a state of excessive deficit. The level of the debt also affects both likelihoods but in opposite directions: the higher is the debt, the higher (lower) will be the likelihood of entering into (exiting from) an excessive deficit. Hughes-Hallett and Lewis (2004, 2005) also find important positive effects from the lagged debt and deficit (and a negative effect from the output gap) on the probability of a country exceeding the 3% of GDP for the deficit for the 15 EU countries over the period 1960-2002 using a simple probit model. However, the focus of their analysis is on the fiscal discipline in the post-Maastricht period. They show that it increased until 1997-1998, but eroded thereafter to an extent that, by 2005, there was less discipline than before the Maastricht process has started.¹¹ Therefore, they conclude that fiscal discipline in the EU was just the product of the threat of a country being excluded from taking part in the Euro-zone. As soon as that sanction was removed (after 1998), countries seemed to relax their fiscal policies and their consolidation efforts.

Finally, Hughes-Hallett and McAdam's (2003) stochastic simulations for the four largest EU states (Germany, France, Italy and UK) allow them to conclude that fiscal targets have to be country-specific and very conservative, and fiscal policy has to be forward-looking to keep the probability of excessive deficits below acceptable limits.

A striking point to notice is the fact that none of these studies actually focus their analyses directly on the determinants of an excessive deficit. Hughes-Hallett and McAdam (2003) simply analyse the probability distribution of a country's deficit ratio under a variety of fiscal rules; Bayar (2001) is only concerned with the entry and exit dynamics of an excessive deficit, whilst Hughes-Hallett and Lewis (2004, 2005) are more interested in analysing the issue of fiscal discipline after Maastricht. Moreover, they consider that economic factors are the only conditionings of the likelihood of an excessive deficit. In reality, to deeply understand why excessive deficits may arise, we

¹¹ In a study of the conditionings of the public deficit in the post-Maastricht period, Annett (2006) shows that the benefits of the fiscal rules, in terms of making fiscal policy less pro-cyclical, evaporated after the creation of EMU. However, his results are more optimistic than those presented by Hughes-Hallett and Lewis (2004, 2005). Annett (2006) argues that the SGP was successful in contributing to fiscal discipline in some countries like Austria, Belgium, Denmark, Finland, Ireland, the Netherlands, Spain and Sweden.

may also pay attention to the political environment. This is a fact that the few existing studies on excessive deficits have ignored but that this paper intends to analyse in detail.

This study goes even further by analysing the interaction between the economic and political determinants of excessive deficits and by providing separate analyses for small and large countries and for countries traditionally affected by large deficits. Finally, the econometric analysis used in this study is different from those employed in the previous studies. Here, in contrast to the duration model used by Bayar (2001) and the simple probit model estimated by Hughes-Hallett and Lewis (2004, 2005), a conditional logit model is estimated allowing for country-specific effects. Those effects are not taken into account in the previous studies, which may affect their estimates.

Therefore, this paper intends to cover those limitations and combine economic and political factors in the understanding of the causes of an excessive deficit in the EU countries. As the 3% rule for the public deficit has been the main reference for the fiscal policy in the EU over the last decade, this study also intends to shed some light on how that rule affected recent fiscal behaviour or, in other words, how EU countries have been coping with excessive deficits after Maastricht.

3. Data and model specification

This section starts by describing the data and the main variables used in the estimation of the factors that influence the probability of an EU country being affected by an excessive deficit. Then, the empirical model to be estimated in this study will be presented and analysed.

3.1. Definition and description of the variables

This study tries to evaluate the impact of economic and political factors on the probability of a country having an excessive public deficit. According to both the Maastricht Treaty and the SGP, an excessive deficit is defined as a deficit higher than 3% of GDP.¹² Therefore, using that value as a reference, this paper looks for the factors that affect the probability of an EU country breaching the 3% of GDP rule for the public deficit. This means that the dependent variable (*Def3*) will be a dummy variable that

¹² This same value was used by Bayar (2001) and Hughes-Hallett and Lewis (2004, 2005). This seems to be a good value of reference because EU countries have been compelled to meet this target either as a convergence criterion to take part in the EMU or, after that, as a requirement of the SGP.

takes value 1 when general government budget surplus as percentage of GDP (*GBS*) is lower than -3% of GDP, and 0 otherwise.

Regarding the literature on public deficits, some economic and political variables will be used as regressors in the identification of the main causes of an excessive deficit. The economic data were collected on an annual basis from the AMECO Database of the European Commission (May, 2007) for 15 EU countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom) over the period 1970-2006. The main economic variables used as regressors in this study are the following:

- Primary (general) government budget surplus as a percentage of GDP lagged one period (*PrimGBS(-1)*). This variable is included in the equation to account for the persistence of past budgetary imbalances on the probability of an excessive deficit.¹³ We expect that the higher the primary surplus (deficit) in the previous period, the lower (higher) will be the current probability of a country breaching the 3% rule for the deficit.
- General government gross public debt as a percentage of GDP lagged one period (*Debt(-1)*).¹⁴ This is another important determinant of a public deficit and, in the same way, of an excessive deficit. Considering that the higher the public debt, the higher is the share of public expenditures that has to be dedicated to interest payments generated by that debt, we conjecture that the probability of an excessive deficit will increase with the public debt. However, Mélitz (2000) and Annett's (2006) findings indicate that a high public debt may force the government to take measures to reduce it by diminishing the deficit. If this is the case, the likelihood of an excessive deficit would be lower the higher is the debt in the previous period. Which of these effects prevails in this case is an issue to be answered in the empirical part of this paper.
- Annual growth of real GDP at price levels of 2000 (*GRGDP*). As the economic performance of a country greatly affects the public budget through automatic

¹³ *PrimGBS(-1)* is used instead of *GBS(-1)* because this latter variable is highly correlated with the government debt (another regressor to be included in the equation). When the interest is discounted from the computation of the deficit, there is no longer that problem. Moreover, the government has greater immediate control over the primary budget than over the interest payments.

¹⁴ Some economic variables are lagged one period to avoid any reverse causality.

stabilizers, we anticipate that excessive deficits will be less likely when the economy is growing faster.

- Real long-term interest rate lagged one period ($RIR(-1)$).¹⁵ This variable captures the effects of the interest rate on the real amount of debt to be paid each period. As this amount is accounted in the current budget, the higher the interest rate last year, the higher will be the burden of the debt to be paid this year and, therefore, the higher the public deficit and the probability that excessive deficits arise.

The data for political variables were mainly collected from Armingeon *et al* (2005) for the period 1970-2004 and the series were updated for 2005 and 2006 using information from the internet site www.electionworld.org (Elections Around the World).¹⁶ The political variables included in the main equation to be estimated in this study are the following:

- Left-wing government (*Left*) is a dummy variable that takes value 1 when the *GovParty* series in Armingeon *et al.* (2005) is equal to 4 or 5, and 0 otherwise. This corresponds to a situation in which there is dominance or hegemony of left-wing parties in the government. Hibbs (1977) suggests that left-wing governments are more prone to fight unemployment and to promote growth. As this behaviour may generate an increase in public expenditure (more transfers, public investment and wages), we expect that left-wing governments have a higher tendency to create excessive deficits than centre or right-wing governments.
- Election year (*ElectYear*) is a dummy that takes value 1 in years of general (parliamentary) elections and 0 in non-election years. According to the thoughts of the political business cycles theory, we anticipate that excessive deficits will be more likely in election years because of the assumed opportunistic behaviour of the government in those years.
- Minority government (*MinGov*) is a dummy that takes value 1 when a minority government is in office and 0 if a (single-party or coalition) government has a majority in the parliament. This variable was built using the *gov_type* series from Armingeon *et al.* (2005). As there is no general consensus in the literature about the impact of this variable on public deficits, we do not anticipate any specific sign for its coefficient in this analysis.

¹⁵ The GDP deflator is used by our source (AMECO) to obtain this variable from its nominal counterpart.

¹⁶ There are some missing values for Greece (1970-1973), Portugal (1970-1975) and Spain (1970-1976) because during those periods these countries were not ruled by democratic regimes.

Two additional variables were included in the equation to control for the period in which the 3% rule for the deficit was implemented in Europe:

- *D92* is a dummy variable that takes value 1 in the period 1992-2006.
- *D99* is a dummy variable that takes value 1 in the period 1999-2006.

These dummies are incorporated in the model to control for the period in which fiscal rules were established in the EU. They will capture the specific behaviour of the EU countries in the period post-Maastricht and in the period following the launch of the single currency. Both dummies will be included in the same regression. *D92* is included to capture the post-Maastricht effect and *D99* tries to capture any additional effect from the SGP, after the run up for EU countries to assure their place in EMU is over. This latter variable is included to test whether EU countries have relaxed their efforts to control the deficit after they have assured a place in the EMU.

Besides the inclusion of all these variables in the model, other economic and political variables – more or less related with these – will be considered in the empirical analysis. They will be described when they are included in the equation.¹⁷

3.2. Model specification

As the dependent variable used in this analysis is binary, the model chosen to estimate the coefficients of interest was a conditional logit model.¹⁸ This model describes the probability of an event occurring given certain conditionings. In particular, it will be used to explain the probability of a country breaching the 3% of GDP rule for the deficit (or having an excessive deficit), given certain economic and political determinants (*x*). In comparison with the traditional linear specification for the study of the determinants of public deficits, this binary choice model has the advantage of allowing for the analysis of an important issue not yet fully analysed in literature but which assumed a great deal of importance in Europe after Maastricht: how to avoid excessive deficits, i.e. deficits higher than 3% of GDP. Mathematically, this model can be represented as follows:¹⁹

¹⁷ See Annex for a complete description of all variables used in this paper. There, we can also find one figure with the evolution of the public deficit in the EU countries over the period 1970-2006 and two other figures with the distribution of the excessive deficits by country and by year, respectively.

¹⁸ The choice between a probit and a logit model is difficult to justify theoretically, but the practical and statistical advantages of the conditional logit for this study were influential in its selection (see the reasons below). Nevertheless, results are very similar when a probit model is used.

¹⁹ For details on this and other binary choice models see, for example, Greene (2003, Ch. 21).

$$\text{Prob}(Def3 = 1 | \mathbf{x}) = \frac{e^{\mathbf{x}'\boldsymbol{\beta}}}{1 + e^{\mathbf{x}'\boldsymbol{\beta}}} = \Lambda(\mathbf{x}'\boldsymbol{\beta}), \quad (1)$$

where $\boldsymbol{\beta}$ is the vector of parameters to be estimated and $\Lambda(\mathbf{x}'\boldsymbol{\beta})$ is the logistic CDF associated with the logit model. The vector of parameters $\boldsymbol{\beta}$ reflects the impact of changes in \mathbf{x} on the probability of excessive deficits.

Whilst Hughes-Hallet and Lewis (2004, 2005) rely simply in the estimation of a pooled probit model, this paper implements panel data techniques in the analysis. In reality, the presence of country-specific effects should be controlled for to avoid biased estimates.²⁰ The application of binary models to panel data analysis is straightforward. The structural model for a panel data can be written as follows:

$$\begin{aligned} y_{it}^* &= \mathbf{x}_{it}'\boldsymbol{\beta} + \varepsilon_{it}, \quad i = 1, \dots, n, \quad t = 1, \dots, T_i, \\ Def3_{it} &= 1 \text{ if } y_{it}^* > 0, \text{ and } 0 \text{ otherwise.} \end{aligned} \quad (2)$$

In this case, y^* is an unobserved outcome and ε_{it} is an error term. Regarding the assumptions made over the error term, we can have either a random effects model (where $\varepsilon_{it} = v_{it} + u_i$ and v_{it} and u_i are independent random variables, u_i has mean 0 and variance equal to σ_u^2 and v_{it} is normally distributed with mean 0 and variance $\sigma_v^2 = 1$), or a fixed effects model (where $\varepsilon_{it} = v_{it} + \alpha_i d_{it}$ and d_{it} is a dummy variable that takes the value 1 for individual i in period t , and 0 otherwise). Theoretically, the distinction between random and fixed effects relies on the relationship between u_i and \mathbf{x}_{it} . If they are not correlated, then we have random effects; if they are correlated, the model has fixed effects. Considering that, for the period in analysis, the entire population of EU countries is included in the sample and that each country has particular economic, political and institutional characteristics, it is highly probable that u_i is correlated with the regressors. Hence, fixed effects are assumed to be present in the model.

However, the traditional unconditional fixed effects estimator can be affected by some statistical problems. This estimator relies on the assumption that T_i is increasing for the constant terms to be consistent. But in this formulation T_i is fixed, therefore, the estimators of the constant terms and subsequently the estimator of $\boldsymbol{\beta}$ are not consistent. This is called the incidental parameters problem and it is more severe when T_i is small. A way of avoiding this problem is by using a minimal sufficient statistic for α_i .

²⁰ Unsurprisingly, the hypothesis of homogeneity of the individual coefficients was rejected in this study.

According to the literature and considering the dependent variable used in this study, $S_i = \sum_{t=1}^{T_i} Def3_{it}$ is the suggested minimal sufficient statistic for a fixed effects logit model.²¹ Hence, the conditional likelihood function can be written as follows:

$$L^c = \prod_{i=1}^n \frac{e^{\sum_{t=1}^{T_i} Def3_{it} \mathbf{x}_{it}' \boldsymbol{\beta}}}{\sum_{\sum_t d_{it} = S_i} e^{\sum_{t=1}^{T_i} d_{it} \mathbf{x}_{it}' \boldsymbol{\beta}}} \quad (3)$$

This equation is now free of the incidental parameters α_i and its maximization can be done by the conventional methods.

4. Empirical results

The empirical results from the estimation of the conditional logit model are presented and analysed in this section.²² This analysis comprises the study of the economic and political determinants of excessive deficits and some robustness tests.

4.1. Main economic and political determinants of excessive deficits

The estimation results of the model described in the previous section are shown in Table 1.²³ The first column presents the results for the main specification, which includes the economic and political variables defined previously. A more detailed analysis of the economic determinants of an excessive deficit in the group of EU countries is presented in the rest of the Table.

Regarding first the results presented in column 1, we find that the primary government surplus ($PrimGBS(-1)$) has a negative impact on the probability of an excessive deficit. This means that there is some degree of persistence of past budgetary imbalances. Hence, the higher and more persistent is the primary deficit, the more

²¹ Despite sufficient statistics being available for the logit model, they are not available for the probit model. This represents the main reason for the choice of the conditional logit model.

²² Although this study presents only results for the conditional logit model, unconditional logit and probit models using either random or fixed effects were also estimated, but the main conclusions of this study were not significantly affected. Several heteroscedastic probit models were also run considering different patterns of heteroscedasticity, but none clearly rejected the homoscedasticity hypothesis. Those results are not presented here to save space, but they are available upon request. This note applies to all cases in which results are mentioned but not reported in this paper.

²³ Since in the conditional logit the fixed or individual effects are not estimated, it is not possible to compute the respective marginal effects. An alternative way of intuitively interpreting the results from the conditional logit is using an odds-ratio analysis. As the ratio of the probability of an excessive deficit to a not excessive deficit is given by $e^{\mathbf{x}'\boldsymbol{\beta}}$, differentiating this expression with respect to any of the regressors (x_k), we get e^{β_k} , which means that for any unitary change in x_k , the odds will change by a factor of e^{β_k} , holding all other variables constant.

difficult it will be for a country to avoid an excessive deficit. In the second estimation presented in Table 1, the effects of the fiscal variables on the probability of an excessive deficit are analysed in more detail. The variable *PrimGBS* was subdivided into its two major components: the primary total expenditure as percentage of GDP (*PrimTExp*) and the total revenues as percentage of GDP (*TRevenue*). As expected, the inclusion of these variables in the model, instead of *PrimGBS*, confirms the results shown by Bayar (2001), i.e. that the likelihood of an excessive deficit increases with public expenditures and decreases with government revenues. Thus, the significant effect of the primary deficit on the probability of an excessive deficit comes from both the expenditure side and the revenue side.²⁴

[Insert Table 1 around here]

The public debt (*Debt(-1)*) is another important determinant of the likelihood of an excessive deficit. Results show that the probability of an excessive deficit increases with the public debt, which is in accord with Balassone and Francese (2004) and Mink and de Haan's (2005) view.²⁵ Despite this effect being lower than the effect of the primary deficit, it is sufficient to conclude that the automatic effects of an increase in the interest payments due to a higher debt have an effect on the probability of an excessive deficit that outweighs any desire on the part of the government to reduce the deficit (and to avoid excessive deficits) when the debt is high.

The square of the public debt (*Debt_sq*) is also added to the model in regression 2 with the aim of inferring whether governments' will to reduce the deficit and to avoid excessive deficits decreases when the public debt is very high, as recognised by Mélitz (2000) and Annett (2002). In fact, results seem to confirm that idea, i.e. they show that the probability of an excessive deficit increases as the debt increases, but for huge levels of public debt that probability tends to decrease. This means that when the debt reaches high values, governments' will to control the deficit is higher than the automatic effect of interest payments. However, the statistical evidence to support this idea is rather

²⁴ A more disaggregated analysis of the effects of public expenditures and revenues, considering variables for government wages, investment, transfers, direct and indirect taxes, has also confirmed these findings: expenditure items presented significant positive signs whilst revenue items presented significant negative signs (results are not presented here).

²⁵ As an example, results presented in column 1 show that one percentage point increase in *Debt(-1)* will increase the ratio between the probability of an excessive deficit and a not excessive deficit by a factor of around 1.0741 ($= e^{0.0715}$), holding all other variables constant.

weak. The coefficient on *Debt_sq* is not always statistically significant when included in the other specifications presented in this study (results are not presented here).

The effect of the economic environment is captured by the growth of real GDP (*GRGDP*). When the economy is growing faster the probability of an excessive deficit is reduced, which means that a good economic environment is essential for a country to avoid excessive deficits. Other variables – like the output gap, the unemployment rate and its annual variation – can be used to control for this effect. The results of some regressions including these variables are shown in columns 3 to 5. When the output gap (*OutpGap*), measured as the gap between actual and potential GDP as a percentage of potential GDP at 2000 market prices, is included in the model instead of *GRGDP*, no significant differences are noticed in the overall results. In particular, the higher is the actual GDP relatively to its potential value, the lower will be the probability of a country breaching the 3% of GDP value for the public deficit.

As the economic cycle affects the public budget largely through the automatic stabilizers, then when there is a recession, tax revenues decrease and unemployment benefits push up public expenditures. Therefore, the effect of a higher unemployment rate on the probability of an excessive deficit should be significantly positive. Results presented in columns 4 and 5 for the unemployment rate (*UR*) and its annual change (*ChgUR*), respectively, confirm this expectation.²⁶

Regarding the effects of the real interest rate (*RIR(-1)*), we find evidence of a negative effect of this variable on the likelihood of an excessive deficit, a result that can be justified by the increase in interest expenditure on public debt. On the contrary, the inflation rate (*Infl*) seems to have no effect on that likelihood.

Concerning the effects of the fiscal constraints imposed by Maastricht and by the SGP, results seem to indicate a higher fiscal discipline after Maastricht, and this effect seems to be reinforced in the period after 1999. A contrary view is shared by Tujula and Wolswijk (2004), Hughes-Hallett and Lewis (2004, 2005) and Annett (2006). They claim that fiscal discipline eroded after the run-up to EMU was over. Hughes-Hallett and Lewis (2004, 2005) show that the SGP appears to have reduced the probability of a country violating the 3% limit, but they argue that the inclusion of simple shift dummies in the model does not capture a possible gradual erosion of fiscal discipline. Therefore, they also include in their study time trends for the pre-EMU and post-EMU periods and

²⁶ Due to the well-known relation between growth and unemployment rate, we prefer not to include both variables in the same regression. In fact, these variables present a high correlation in this study.

their results suggest that in each subsequent year under the SGP regime (post-EMU) there was an increasing tendency for EU countries to violate the 3% limit for the deficit. To capture this idea, some additional changes were made in our fiscal variables. The two dummy variables now included in the model are the following: one covering the period 1992-1998, i.e. the run-up to EMU (*D9298*); and the other covering the period after 1999 (*D99*). Additionally, a time trend for each of these periods was included in the specification to control for the gradual (annual) effects of the fiscal discipline (*D9298t* and *D99t*, respectively). The estimation results of such a specification are shown in column 7. Only the coefficients on *D9298t* and *D99* are significant. This means that, on average, the probability of an excessive deficit is not significantly lower after Maastricht than before, but the efforts made by all EU countries to take part in EMU were helpful in gradually reducing that probability until 1998. However, after 1999, despite the probability of an excessive deficit being lower than before Maastricht, we are not able to identify further significant efforts to reduce it. Therefore, despite the results presented in this study are showing that the efforts of fiscal consolidation were slightly relaxed after 1999, they do not indicate any significant erosion of the efforts made until 1998, contrarily to what is argued by other authors.

The political variables represent another important group of determinants of the probability of an excessive deficit. First, all regressions show evidence of ideological effects, i.e. left-wing governments (*Left*) have a higher propensity to generate excessive deficits than centre or right-wing governments. This result strongly supports the ‘partisan’ argument that left-wing governments tend to promote a higher degree of public intervention in the economy, caring more about unemployment and growth than inflation. Consequently, they are more prone to increase expenditures and to generate deficits than right-wing parties. In fact, for the same reasons, and as the results presented in this paper reveal, they are more prone to generate excessive deficits as well.

Results also show that the probability of an excessive deficit tends to increase in election years (*ElectYear*).²⁷ According to the thoughts of PBC theory, this evidence indicates that EU governments are trying to influence macroeconomic outcomes before

²⁷ This variable was also computed taking into account the timing of the elections during the year, because in theory the opportunistic effects of an election in the beginning of the year might be felt in the previous year. In that case, the dummy takes value 1 in the (pre-) election year if the election was held in the (first) second semester of the year and 0 otherwise. Results and conclusions were not affected by this different definition for *ElectYear* (results are available upon request).

elections by running a loose fiscal policy (more spending and/or tax reductions) in order to increase their probability of re-election. Consequently, this opportunistic behaviour generates a higher propensity for excessive deficits in election years.

Finally, there is some evidence that minority governments (*MinGov*) have a lower propensity to generate excessive deficits than majority governments. Some authors have already noticed a similar result in the analysis of public deficits.²⁸ In fact, as majority governments do not need support from other parties in the parliament to implement their preferred measures – contrarily to minority governments – deficits are more able to increase under their terms in office than under minority governments. Moreover, as the negative effects of unpopular policies can be more easily imputable to a majority than to a minority government, the former can try to avoid them so as not to lose electoral support. As a result, the propensity to excessive deficits increases when majority governments are in office. According to the results of this paper and the PBC theory, this opportunism can be even more intense when majority governments are under electoral pressure.

Thus, the results presented until now show that not only economic but also political factors affect the probability of an EU country breaching the 3% rule for the deficit. This represents some new evidence for the study of this issue. In particular, election years, left-wing and majority governments tend to be more prone to generate excessive deficits in Europe. Finally, our results provide some evidence that, on average, fiscal discipline did not erode after 1999 in the EU, contrary to what is stated by some authors.

4.2. Analysis of the political determinants of excessive deficits

Some additional political variables will also be included in the model to add more detail to the important effect of political factors on the probability of a country having a deficit higher than 3% of GDP. Results are presented in Table 2 and Table 3. An important aspect to emphasize is the fact that the economic determinants of an excessive deficit and the dummies for the fiscal constraints remain always highly significant independently of changes made in the political variables.

²⁸ See Borrelli and Royed (1995), Sakamoto (2001) and Tujula and Wolswijk (2004). In fact, as stated by Edin and Ohlsson (1991), some minority EU governments, like successive Danish and Swedish governments, have been successful in avoiding excessive deficits.

In the first two columns of Table 2, other variables are used to capture the partisan effects. As indicated in Section 3.1, the dummy variable *Left* was computed from the ordinal index *GovParty* to capture the existence of partisan effects according to the traditional dichotomy between ‘left’ and ‘right’ parties. However, when *GovParty* is included instead of *Left* the conclusions about the effects of the political orientation of the government on the likelihood of an excessive deficit do not change. As the ideological orientation of the government changes gradually from the right to the left the probability of an excessive deficit increases. Alternatively, we can include the percentage of left or right-wing parties in the cabinet as a way of controlling more directly for the effects of the relative power that that party has in the government. The percentage of right-wing parties in the cabinet was included (*%Right*) in the second regression. Results remain consistent and show that the higher is the percentage of right oriented policymakers in the government, the lower will be the probability of an excessive deficit.

[Insert Table 2 around here]

In column 3, a dummy variable that takes value 1 in the years before elections (*YrBeforeElect*) was included in the model to capture possible opportunistic effects in those years, i.e. to control for the possibility that the government starts to prepare the field for its re-election in advance. The coefficient on this variable is positive but it is not significant, whilst the coefficient on *ElectYear* remains highly significant. This means that governments avoid starting too early to influence economic activity, because, in that case, it may not be possible to hide the effects of tax reductions or increases in expenditures on the budget balance. In fact, it is less easy to hide the negative effects of those measures in a pre-election year than in an election year since the information on the pre-election year’s budget deficit is likely to be published prior to the election date.

To study in more detail this opportunistic government behaviour, the dummy *ElectYear* was decomposed into four dummies, each of them taking the value of 1 in the quarter in which the election takes place and 0 otherwise: *ElectQ1*, *ElectQ2*, *ElectQ3*, and *ElectQ4*. The idea is to find whether opportunistic policymakers can profit from the timing of an election in the course of the year. Results are presented in column 4 and show that there is a higher margin for an opportunistic behaviour when elections take

place in the second or third quarters of the year. The probability of an excessive deficit increases as election dates move from the beginning to the middle of the year, decreasing again as election dates move to the end of the year. Some reasons can be advanced for this result. First, if elections take place at the beginning of the year – which coincides with the fiscal year for most EU countries²⁹ – the incumbent government may not have enough time to manipulate the economy because the information on its fiscal performance in the previous year is not easy to hide and, in reality, it will be evaluated on the basis of that performance. When the election date moves to the second and third quarters, opportunistic policymakers have more time to manipulate the economy and signal competence because the information about its fiscal performance in that year is not available yet. However, as we move to the end of the year, more reliable information on the budget balance becomes available. This fact will decrease the incentive for the incumbent government to signal false competence. Thus, according to these results, a good strategy for EU countries to avoid excessive deficits caused by the opportunistic behaviour of their policymakers would be to schedule elections for the beginning or end of the year.

An important conclusion obtained in the work done so far is the fact that all the above results are consistent with the rational opportunistic models in the sense that governments try to signal competence before the election date but the period to do that is indeed shorter than the one predicted by the traditional Nordhaus-Lindbeck model.

The PBC theory not only states that governments try to manipulate the economy right before elections in order to increase their chance of re-election but also argues that after elections governments will try to correct the fiscal imbalances generated by the electoral period. Therefore, we expect that the probability of an excessive deficit is lower after elections. Results presented in the last 3 columns of Table 2 give some support to this expectation. The first variable used to control for this idea is a dummy that takes value 1 in the first half of the political cycle of a government (*PolCycle*). Results suggest that the propensity for an excessive deficit is lower in the first half of the mandate than in the second. However, results presented in regressions 6 and 7 show that the efforts to control excessive deficits are especially felt in the second (and third) year(s) after last election. Thus, evidence is suggesting that the correction of a substantial fiscal imbalance is not immediate; it takes some time for the measures taken

²⁹ The UK is an exception because the fiscal year starts in the second quarter of the calendar year. However, results were not affected by the re-codification of the dummies to take that into account.

by the new government to control an excessive deficit to have visible effects. This evidence represents a new and interesting finding in this field.

The effects of the fragmentation of political power on the likelihood of an excessive deficit are deeply analysed in Table 3. In the first column, the issue of the fragmentation over time is analysed. Some authors consider the tenure in office or political instability as an important determinant of public deficits (Grilli *et al.* (1991), de Haan and Sturm (1994) and Annett (2002)). The variable used in this study to capture the effect of the political instability is the number of changes in government per year (*NGovChg*). As it is highly correlated with *ElectYear*, this last variable was dropped from this regression. Results show that the higher instability caused by changes in government is also one of the causes of excessive deficits.

[Insert Table 3 around here]

The next two regressions consider the direct effects of two variables that are often used in the empirical literature to capture the impact of political fragmentation on public deficits: the Roubini and Sachs' (1989) index for the fragmentation of the political system (*RSIndex*); and the type of government in office (*GovType*).³⁰ Economists generally claim that governments formed by multiple parties and minority governments tend to run larger deficits. Our evidence for the EU countries is contrary to that view. Results show that the greater is the fragmentation of the political system the lower will be the probability of an excessive deficit arising. The justification for this result is somehow related to the one advanced to explain the result obtained for *MinGov*: as less fragmented (especially single-party) governments are more able to take unpopular measures to reduce the public deficit, they are also better able to increase deficits if they intend to do so; moreover, as the negative effects of unpopular policies can be more easily imputable to a less fragmented than to a more fragmented government, single-party governments may avoid restrictive fiscal policies so as not to lose electoral support.

However, these two variables have a problem that was already noticed by Edin and Ohlsson (1991), Borrelli and Royed (1995), Sakamoto (2001) and Perotti and Kontopoulos (2002): as they do not make a clear distinction between majority/minority

³⁰ See Annex for details on their definition and sources.

governments and single-party/multi-party governments, they are essentially capturing the effects of minority governments. In order to address this problem, we include in the model two variables to control directly for those two aspects of the political system: one for the degree of government control over the parliament (*MinGov*); and other for the number of parties in the government (*NGovParty*).³¹ In fact, only the coefficient associated with *MinGov* is significant; the number of parties in the government coalition seems to have no significant effect on the probability of an excessive deficit.³² Even when a dummy that takes value 1 when a single party government is in office (*SPGov*) is included instead of *NPartyGov*, no significant evidence is found that single-party governments are more (or less) prone to avoid excessive deficits than multi-party governments. Hence, it is the degree of government control over the parliament rather than the number of parties in the coalition that is important to explain excessive deficits.

To analyse in more detail the effect of the degree of government control over the parliament, two dummies were included in the model instead of *MinGov*: a dummy that takes value 1 when the government is formed by a single party with a majority in the parliament (*MajSPGov*); and other that assumes value 1 when the government is formed by a coalition with a majority in the parliament (*CoalGov*). Results confirm the idea that single-party majority governments have a higher propensity for excessive deficits than minority governments. As single-party majority governments have more power to control deficits, they also have more power to satisfy the spending demands of their supporters. This total control over fiscal policy by just one party and the already mentioned electoral motivation can make excessive deficits more likely under this kind of government than under minority (or coalition) governments, where there is some control by the other parties to avoid this opportunism.

In the regression presented in the last column of Table 3, the impact of the degree of fragmentation of the parliament on the likelihood of an excessive deficit is controlled for by using a fragmentation index for the distribution of the number of parties in the parliament (*FragIndex*). This index is equal to $1/\sum p_i^2$, where p_i is the

³¹ This variable was obtained from different sources. See Annex for details. The Herfindhal index for the seat shares of all parties in the government (*HERFGOV*) and the government fractionalization index (*GOVFRAC*), obtained from *The Database of Political Institutions* (DPI2004), were also used instead of *NGovParty* but their coefficients were not significant either.

³² Edin and Ohlsson (1991) have previously found no evidence that the number of parties in office affects governments' ability to reduce deficits. We also considered a specification with the number of ministers in the government but the coefficient on this variable was not significant.

percentage of seats of party i in the parliament.³³ Evidence indicates that excessive deficits are not directly influenced by the degree of parliamentary fragmentation.

Some further attempts to control for the effects of other institutional factors on the probability of an excessive deficit were made, like the inclusion of two dummies to control for the fragmentation of the budgetary process. These dummies are similar to those used by Annett (2006) to control for fiscal governance: one takes value 1 when the finance minister has leading role in the budget process; and the other takes value 1 when different parties negotiate a fiscal contract and 0 otherwise. But none of the coefficients on these variables was statistically significant (those results are not shown here).³⁴ Some authors argue that as the population is getting older some additional pressure is put on fiscal finances. To take into account the possible effects of the age structure of the population on the probability of an excessive deficit, the ratio of population over 65 in the whole population was also included in the model. Nevertheless, the coefficient on this variable was not significant and the main results remained unaffected.

4.3. Analysis of the interaction between the determinants of an excessive deficit

After the economic and political determinants have been analysed in detail, it is interesting to explore some additional effects from the interaction between those determinants of an excessive deficit. One of the aims of this additional analysis is, for example, to check whether the political variables matter more in difficult times or not. This study does not find significant effects from the interaction between the economic and political variables. In the first two columns of Table 4 the variable *Left* is interacted with *GRGDP* and *ChgUR*, respectively. The coefficient on *Left*GRGDP* is not significant, which means that both left and centre-right governments will be equally unable to avoid excessive deficits when growth is low. A similar conclusion is obtained when the annual change in the unemployment rate is used instead of the growth of real GDP (see coefficient on *Left*ChgUR*).³⁵ No additional evidence was found from the interaction of the other political variables with these economic variables. Therefore, this

³³ This index is the Laakso and Taagepera (1979) measure of the effective number of parties in the parliament with parties being weighted according to their size (percentage of seats). The greater this index, the greater is the effective number of parties and fragmentation of the parliament.

³⁴ Perotti and Kontopoulos (2002) have already justified the insignificance of these kind of variables by the fact that those budgetary procedures are nearly time invariant.

³⁵ Identical results were obtained for the output gap and unemployment rate when these variables were included in the model instead of the growth of real GDP (results not reported here).

work shows that the idea that political effects are more visible when economic conditions are deteriorating finds very little support when our analysis is focusing on excessive deficits. In this case, political factors matter in any economic situation.

[Insert Table 4 around here]

In columns 3 and 4 the political variables are interacted with the dummies for the Maastricht and SGP fiscal constraints as a way of checking whether they have conditioned political behaviour in the EU or not. Results seem to be more robust for the period after 1999, but, contrarily to what is sustained by Tujula and Wolswijk (2004) and Annett (2006), they show that the partisan and opportunistic effects remain alive despite the fiscal constraints imposed in Europe after 1992. In particular, this study provides evidence that election years and left-wing governments have had a higher impact on the likelihood of excessive deficits after 1999.

The remaining four columns of Table 4 show some additional results of the interaction between the political variables. A striking result is found in column 5: evidence suggests that left oriented governments are the most responsible for the opportunistic behaviour right before elections; when a left government is in office in the election year, the probability of an excessive deficit is higher than when the government is formed by centre and/or right parties.³⁶

Another interesting result regarding left oriented governments comes from regression 6: excessive deficits are greatly associated with left-wing governments with majority in the parliament, but when a left-wing government is in a minority in the parliament our results show that its propensity for excessive deficits is significantly lower than when a right oriented minority government is in office. This means that when left governments have total control over the parliament they have the support they need to implement measures to promote growth and to reduce unemployment. As a result, public expenditures will increase as well as the deficit and the probability for an excessive deficit. Due to this propensity to generate excessive deficits, the other (centre and right) parties will be very stringent in supporting minority-left government initiatives. Therefore, minority-left governments have a lower propensity for excessive deficits than right-wing governments.

³⁶ A similar conclusion is obtained when *Left* is interacted with *PolCycle* (results are not presented here).

Finally, despite the coefficient on *SPGov* not being statistically significant when this variable is included in the model, its interaction with *Left* generates a significant coefficient, as it can be observed in regression 7. Evidence suggests that excessive deficits are more likely when left-wing single party governments are in office. As left-minority governments are not associated with excessive deficits, it is likely that this result is due to the presence of the majority single-party effects. An additional regression was run for the interaction between *MajSPGov* and *Left*. Results show a significant positive coefficient on that variable (see regression 8). A similar argument to the one advanced above to explain why left-majority governments are more prone to excessive deficits can be used to justify this result: excessive deficits are more likely when left single-party governments with majority in the parliament are in office because they have the power and support they need to implement the policies that are more in accord with their ideology. This represents another important conclusion of this study.

Besides these interactions, other attempts were made to find additional inter-related effects between the determinants of excessive deficits, but no significant results were obtained from those experiments.

4.4. Robustness tests

Some robustness tests were performed to check whether results are sensitive to the time period considered or to particular specificities of the countries included in the sample. Table 5 presents the most interesting results of those robustness checks and from which are obtained some new and important contributions to the literature on public deficits for the EU countries.

[Insert Table 5 around here]

The first three regressions provide a pertinent analysis for the periods before and after the imposition of the Maastricht constraints. The first regression considers the period before Maastricht, whilst in regressions 2 and 3, the sample is restricted to the period 1992-2006; in the third regression, the sample is further restricted to the countries that have already taken part in EMU. Results show that after Maastricht the probability of an excessive deficit seems to be no longer affected by public debts or real interest rates. The overall trend to reduce the public debt to less than 60% of GDP and

the required convergence of interest rates to low and stable values during this period is possibly behind this result. Thus, it seems that Maastricht criteria and the SGP fiscal constraints have indeed been effective in controlling the negative effects of these variables on the likelihood of excessive deficits.

Regarding the political variables, the most interesting result comes from the coefficient on *NrPartyGov* for the period after Maastricht, especially for the Euro-zone countries. Evidence is suggesting that countries with multi-party governments were more successful in avoiding excessive deficits than single-party governments, probably because the former were more successful in using the (fiscal) rules imposed by a supranational organization to build an internal consensus around the necessity of balancing their public accounts. Moreover, results also reinforce the idea that partisan effects and political opportunism are still alive and well after Maastricht.

Some authors state that Maastricht criteria and SGP fiscal constraints are more suited to small countries than to large countries because small countries are more accustomed to external influences over policy, and, as they tend to have less bargaining power, the loss of reputation from violating the fiscal rule is greater.³⁷ Regressions presented in columns 4 and 5 intend to provide the necessary empirical evidence for that argument – that is, they intend to test if the fiscal constraints have only affected the small countries or whether they have also affected large countries. Column 4 shows the results for the group of the 5 largest EU countries (France, Germany, Italy, Spain and the UK), whilst column 5 presents the results for the other 10 ‘small’ countries. Evidence clearly supports the argument that EU fiscal constraints are more suited for small countries: the coefficients on the dummies for the period in which those constraints were imposed in Europe are highly significant for the group of small countries (see column 4), but insignificant for the group of large countries (see column 5). Therefore, the fiscal constraints were highly effective in reducing the propensity for excessive deficits in the small EU countries but they were ineffective for large countries. This evidence is clearly confirmed by the recent violation of the SGP criteria for the deficit by France, Germany, Italy and the UK. Empirical evidence also suggests

³⁷ See, for example, Busmeyer (2004), Buti and Pench (2004) and Annett (2006). Buti and Pench (2004, p.1027) also argue that the costs of fiscal consolidations tend to be proportionality higher in large than in small countries because small countries “have a stronger incentive to undertake supply-side reforms rather than pursuing an expansionary fiscal policy, since reforms not only boost potential output directly, but also induce inflationary pressure which allows them to gain competitiveness and increase external demand”.

that fiscal imbalances in large countries are much more sensitive to interest rate oscillations than in small countries.

Next the 15 EU countries are divided in two different groups: the first includes only the countries that run excessive deficits – higher than 3% of GDP – in more than half of the years in the period 1970-2006 (Belgium, Greece, Ireland, Italy, Portugal, Spain and the UK); and the other contains the remaining EU countries (see Annex for details). Two regressions were performed, one for each group. Results are presented in columns 6 and 7 and show that Maastricht criteria and SGP fiscal constraints were far more effective in the group of countries that traditionally presents excessive deficits (see column 6) than in the other group (see column 7). Therefore, those fiscal constraints were very important to bring some discipline to the public accounts of the first group of countries. Additionally, partisan effects and majority governments seem to be the major political causes of excessive deficits in the first group, whilst opportunistic behaviour before elections is the main political cause of excessive deficits in the second group.

Some specifications were also rerun excluding one country at a time. Despite the significance of *Left* and *MinGov* being sometimes slightly affected when, respectively, Greece or the UK and Ireland or Spain were excluded from the sample, results and the main conclusions of this paper remain unaffected independently of which country is excluded from the sample.

5. Conclusions

Several previous studies have contributed to identifying the factors that influence public deficits (and debts) in both OECD countries and EU countries over the last decades. They all consider that a set of economic, political and institutional factors play a very important role in the understanding of public deficits in industrial democracies. However, the study of the determinants of excessive deficits remains practically unexplored. For that reason, this study tries to contribute to the literature by identifying the main causes of an excessive deficit in the group of EU countries.

Estimating a conditional fixed effects logit model over a group of 15 EU countries for the period 1970-2006, this paper provides evidence that unfavourable economic conditions, parliamentary elections and political instability, and majority left-wing governments are important causes of excessive deficits in the EU countries. Moreover, the institutional constraints imposed after Maastricht over the EU countries'

fiscal policy have been important in reducing the probability of excessive deficits in Europe, especially in small countries and in countries traditionally characterised by a higher propensity to excessive deficits. However, contrary to what some authors argue, empirical evidence does not indicate any significant erosion of the fiscal efforts made by the EU countries to take part in the EMU after they have been accepted.

A more detailed analysis of the results provided by this study reveals that the higher and more persistent is the public deficit, the more difficult it will be for a country to avoid excessive deficits. High public debts are also linked to excessive deficits due to the increase in interest payments, although there is some tentative evidence that huge debts can encourage governments to take measures to correct fiscal imbalances.

On the pure macroeconomic side, this study reveals that the growth rate of real GDP is the most important determinant of the probability of an excessive deficit. When the economy is growing at a good pace, government revenues will increase. At the same time, as unemployment decreases, government expenditures on unemployment subsidies decrease too. Consequently, the probability of an excessive deficit will be reduced. Low real interest rates have also been helpful in sustaining this tendency, especially in the large EU countries.

Political variables represent another important group of determinants of the probability of an excessive deficit. This study provides strong evidence of an opportunistic behaviour of policymakers in election years. In fact, EU governments try to influence macroeconomic outcomes before elections by running a loose fiscal policy in order to increase their probability of re-election. Consequently, this opportunistic behaviour generates a higher propensity for excessive deficits in election years. This is the main political cause of excessive deficits in the EU area, especially in countries that are not usually characterised by such fiscal disequilibria.

Evidence also suggests that EU governments tend to avoid starting too early to influence economic activity, because, in that case, it may not be possible to hide the effects of tax reductions or increases in expenditures on the budget balance. This finding is consistent with the rational opportunistic models in the sense that governments try to signal competence before the election date but the period to do that is indeed shorter than the one predicted by the traditional PBC model. Finally, it seems to take some time for new governments to control public accounts after elections: results show that the probability of an excessive deficit is reduced only two or three years after elections.

This study also provides evidence that left oriented governments are the most responsible for the opportunistic behaviour before elections. Excessive deficits are largely associated with left governments, especially those with a majority in parliament. However, a new and interesting result arises from our analysis: if a left government is in a minority, its propensity for excessive deficits is significantly reduced. This means that when left governments have total control over the parliament they have the support they need to implement measures to promote growth and to reduce unemployment. As a result, public expenditures will increase, as well as the deficit and the probability for an excessive deficit. Due to this propensity to generate excessive deficits, the other (centre and right) parties will be very stringent in supporting minority-left government initiatives. Therefore, when a left government with minority in the parliament is in office, the propensity for excessive deficits will be lower than when the government is formed by centre and/or right parties. Moreover, this paper also provides significant evidence that it is the degree of government control over the parliament rather than the number of parties in a coalition that is relevant to explain excessive deficits in Europe.

Some authors argue that political effects are more visible when the economic conditions are deteriorating. This study finds very little support for this argument. In reality, it shows that political factors matter in any situation. Moreover, the results provided by this study also indicate that the partisan and opportunistic effects remain alive and well despite the fiscal constraints imposed in Europe after 1992.

Additionally, this study also provides some evidence indicating that the political instability caused by an increase in the number of changes in government per year is another relevant cause of excessive deficits.

In sum, this paper shows that the inclusion of political variables is important to fully explain excessive deficits in Europe. Going a step forward relatively to the existing literature and using a different econometric approach, this study provides a detailed analysis of the presence of political opportunism and partisan effects in that context. The electoral calendar and majority left-wing governments seem to be the most responsible factors for excessive deficits in Europe, a situation that remains well evident even after the implementation of the fiscal constraints over the EU countries. Nevertheless, evidence provided in this study also reveals that particular attention should be given to the impact of those constraints and to the size of each country in the analysis of excessive deficits.

Regarding all this evidence, this paper concludes that the supranational fiscal constraints imposed after Maastricht, low public debts, growth promoting policies, mechanisms to avoid political opportunism and partisan effects, and competent governments that search for a broad parliamentary consensus are essential conditions for an EU country to avoid excessive deficits. Moreover, the results presented in this paper raise the idea that a good strategy for the EU countries to avoid excessive deficits caused by the opportunistic behaviour of their policymakers would be to schedule elections for the beginning or the end of the year.

After analysing the causes of excessive deficits it would be interesting to analyse what factors may condition their duration. Some countries are quick to stabilize their public accounts as soon as large public imbalances arise, but others live with excessive deficits for a long time. Is that because they have a particular preference for excessive deficits? Or, are they unable to take the necessary measures to correct them? This is an issue that remains unexplored in the literature and that represents an appealing opportunity for future research.

Finally, it might be worthwhile to extend the analysis of the causes of excessive deficits to other developed or developing countries. Their specific economic and political environment and the absence of supranational fiscal constraints could perhaps shed some more light on the factors that trigger excessive deficits and on the measures that could be taken to avoid such fiscal imbalances. In the European context, an extension of this study to the countries that have recently joined the EU may possibly bring some additional insights to the understanding of the efforts that they need to make to control their public accounts towards a future adhesion to the Euro-zone.

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Tables

Table 1. Analysis of the economic determinants of an excessive deficit

| Prob($Def3=1$) | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|---------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| <i>PrimGBS(-1)</i> | -0.9252 (-8.64)*** | | -0.8917 (-8.07)*** | -0.8481 (-8.21)*** | -0.9212 (-8.37)*** | -0.9194 (-8.57)*** | -0.9642 (-8.16)*** |
| <i>PrimTExp(-1)</i> | | 0.8267 (8.10)*** | | | | | |
| <i>TRevenue(-1)</i> | | -0.8476 (-7.46)*** | | | | | |
| <i>Debt(-1)</i> | 0.0715 (5.64)*** | 0.1384 (4.00)*** | 0.0617 (5.15)*** | 0.0477 (3.92)*** | 0.0753 (5.86)*** | 0.0726 (5.66)*** | 0.0803 (5.79)*** |
| <i>Debt_sq(-1)</i> | | -0.0004 (-1.84)* | | | | | |
| <i>GRGDP</i> | -0.3959 (-4.88)*** | -0.4402 (-5.14)*** | | | | -0.3843 (-4.62)*** | -0.3596 (-4.23)*** |
| <i>OutpGap</i> | | | -0.3914 (-4.46)*** | | | | |
| <i>UR</i> | | | | 0.1853 (2.20)** | | | |
| <i>ChgUR</i> | | | | | 0.8971 (4.49)*** | | |
| <i>RIR(-1)</i> | 0.1071 (1.73)* | 0.0470 (0.74) | 0.1000 (1.58) | 0.0535 (0.84) | 0.1158 (1.77)* | 0.1346 (1.80)* | 0.0837 (1.29) |
| <i>Infl</i> | | | | | | 0.0409 (0.67) | |
| <i>D92</i> | -1.0318 (-2.25)** | -1.4697 (-3.12)*** | -1.1270 (-2.40)** | -0.7499 (-1.75)* | -0.8255 (-1.89)* | -0.9109 (-1.86)* | |
| <i>D9298</i> | | | | | | | 0.9952 (1.23) |
| <i>D9298t</i> | | | | | | | -0.4933 (-2.91)*** |
| <i>D99</i> | -1.1978 (-2.42)** | -1.4256 (-2.86)*** | -0.8631 (-1.74)* | -1.1330 (-2.42)** | -1.1972 (-2.37)** | -1.0992 (-2.14)** | -2.0985 (-2.20)** |
| <i>D99t</i> | | | | | | | -0.0786 (-0.48) |
| <i>Left</i> | 0.8188 (0.035)** | 1.0058 (2.51)** | 0.8407 (2.17)** | 0.8175 (2.18)** | 0.8574 (2.19)** | 0.8384 (2.14)** | 0.9647 (2.37)** |
| <i>ElectYear</i> | 0.9218 (0.008)*** | 0.8360 (2.40)** | 1.0046 (2.85)*** | 0.9111 (2.73)*** | 1.0586 (2.99)*** | 0.9364 (2.67)*** | 0.9041 (2.55)** |
| <i>MinGov</i> | -1.0446 (-1.91)* | -0.9854 (-1.77)* | -1.3543 (-2.45)** | -1.1943 (-2.20)** | -1.3583 (-2.45)** | -1.0431 (-1.90)* | -0.9256 (-1.68)* |
| Log-Likelihood | -115.08 | -116.41 | -114.75 | -126.65 | -115.66 | -114.85 | -110.25 |
| AIC | 248.16 | 254.82 | 247.49 | 271.30 | 249.31 | 249.71 | 242.51 |
| SBIC | 286.27 | 301.39 | 285.00 | 309.41 | 287.42 | 292.05 | 289.09 |
| No. Observ. | 510 | 510 | 477 | 510 | 510 | 510 | 510 |

Notes: The z-statistics for the estimated coefficients are in parentheses. Significance level at which the null hypothesis is rejected: ***, 1%; **, 5%; and *, 10%. The coefficients were estimated using a conditional logit fixed effects estimator. $AIC=2(-\ln L+k)$, where k is the number of regressors; and $SBIC=2(-\ln L+(k/2)\ln N)$, where N is the number of observations. McFadden's $R^2=1-\ln L/\ln L_0$, where L_0 is the log-likelihood computed with only a constant term.

Table 2. Analysis of the political determinants of an excessive deficit I

| Prob(Def3=1) | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| <i>PrimGBS(-1)</i> | -0.9259 (-8.67)*** | -0.9289 (-8.62)*** | -0.9352 (-8.61)*** | -0.9559 (-8.49)*** | -0.9164 (-8.61)*** | -0.9211 (-8.60)*** | -0.9434 (-8.50)*** |
| <i>Debt(-1)</i> | 0.0690 (5.53)*** | 0.0695 (5.45)*** | 0.0730 (5.71)*** | 0.0702 (5.46)*** | 0.0711 (5.64)*** | 0.0725 (5.70)*** | 0.0736 (5.68)*** |
| <i>GRGDP</i> | -0.4059 (-4.99)*** | -0.4250 (-5.07)*** | -0.3941 (-4.88)*** | -0.4147 (-5.05)*** | -0.3935 (-4.96)*** | -0.3959 (-4.83)*** | -0.3966 (-4.89)*** |
| <i>RIR(-1)</i> | 0.1192 (1.94)* | 0.1409 (2.26)** | 0.1059 (1.72)* | 0.1164 (1.87)* | 0.0982 (1.60) | 0.1042 (1.70)* | 0.1097 (1.82)* |
| <i>D92</i> | -1.1530 (-2.50)** | -1.3313 (-2.82)*** | -1.0304 (-2.25)** | -1.0608 (-2.28)** | -1.0190 (-2.26)** | -1.052 (-2.27)** | -1.1887 (-2.57)*** |
| <i>D99</i> | -1.0647 (-2.20)** | -0.9296 (-1.93)* | -1.2322 (-2.48)** | -1.1801 (-2.35)** | -1.2003 (-2.44)** | -1.2321 (-2.47)** | -1.1421 (-2.33)** |
| <i>Left</i> | | | 0.8320 (2.13)** | 0.7810 (1.99)** | 0.7358 (1.92)* | 0.8091 (2.09)** | 0.6831 (1.79)* |
| <i>GovParty</i> | 0.2338 (2.06)** | | | | | | |
| <i>%Right</i> | | -0.0139 (-2.53)** | | | | | |
| <i>ElectYear</i> | 0.8635 (2.49)** | 0.8638 (2.48)** | 1.0783 (2.87)*** | | | 1.0845 (2.93)*** | |
| <i>YrBeforeElect</i> | | | 0.4318 (1.20) | | | | |
| <i>ElectQ1</i> | | | | 0.2820 (0.39) | | | |
| <i>ElectQ2</i> | | | | 1.4546 (2.76)*** | | | |
| <i>ElectQ3</i> | | | | 1.7544 (1.99)** | | | |
| <i>ElectQ4</i> | | | | 0.2259 (0.39) | | | |
| <i>PolCycle</i> | | | | | -0.5514 (-1.79)* | | |
| <i>YrAfterElect</i> | | | | | | 0.5006 (1.39) | -0.5063 (-1.15) |
| <i>2YrAfterElect</i> | | | | | | | -1.0431 (-2.31)** |
| <i>3YrAfterElect</i> | | | | | | | -0.8030 (-1.75)* |
| <i>MinGov</i> | -0.9919 (-1.84)* | -1.1647 (-2.13)** | -1.1125 (-2.02)** | -1.0218 (-1.86)* | -0.9597 (-1.79)* | -1.0703 (-1.94)* | -0.9074 (-1.69)* |
| Log-Likelihood | -115.15 | -114.01 | -114.36 | -112.81 | -117.06 | -114.10 | -115.70 |
| AIC | 248.30 | 246.0151 | 248.72 | 249.62 | 252.12 | 248.21 | 253.40 |
| SBIC | 286.41 | 284.12 | 291.06 | 300.44 | 290.23 | 290.55 | 299.98 |
| No. Observ. | 510 | 510 | 510 | 510 | 510 | 510 | 510 |

Notes: The z-statistics for the estimated coefficients are in parentheses. Significance level at which the null hypothesis is rejected: ***, 1%; **, 5%; and *, 10%. The coefficients were estimated using a conditional logit fixed effects estimator.

Table 3. Analysis of the political determinants of an excessive deficit II

| Prob(Def3=1) | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|--------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| <i>PrimGBS(-1)</i> | -0.9096 (-8.57)*** | -0.9321 (-8.64)*** | -0.9318 (-8.64)*** | -0.9170 (-8.53)*** | -0.9241 (-8.64)*** | -0.9391 (-8.60)*** | -0.9155 (-8.45)*** |
| <i>Debt(-1)</i> | 0.0707 (5.57)*** | 0.0729 (5.68)*** | 0.0732 (5.71)*** | 0.0742 (5.73)*** | 0.0710 (5.56)*** | 0.0734 (5.67)*** | 0.0724 (5.65)*** |
| <i>GRGDP</i> | -0.3755 (-4.64)*** | -0.3993 (-4.88)*** | -0.4026 (-4.92)*** | -0.3923 (-4.79)*** | -0.3945 (-4.86)*** | -0.4043 (-4.92)*** | -0.3970 (-4.88)*** |
| <i>RIR(-1)</i> | 0.1319 (2.02)** | 0.0930 (1.48) | 0.1008 (1.62) | 0.0848 (1.31) | 0.1109 (1.76)* | 0.0974 (1.55) | 0.1033 (1.66)* |
| <i>D92</i> | -1.0271 (-2.27)** | -0.9270 (-2.01)** | -1.0393 (-2.26)** | -0.9822 (-2.14)** | -1.0412 (-2.27)** | -0.9688 (-2.09)** | -0.9651 (-2.04)** |
| <i>D99</i> | -1.0698 (-2.19)** | -1.1999 (-2.42)** | -1.1250 (-2.30)** | -1.2280 (-2.45)** | -1.1981 (-2.42)** | -1.2127 (-2.44)** | -1.2295 (-2.47)** |
| <i>Left</i> | 0.8182 (2.09)** | 0.7649 (1.99)** | 0.7170 (1.88)* | 0.7514 (1.92)* | 0.8633 (2.09)** | 0.7292 (1.83)* | 0.7962 (2.04)** |
| <i>ElectYear</i> | | 0.9588 (2.73)*** | 0.9464 (2.70)*** | 0.9429 (2.71)*** | 0.9216 (2.64)*** | 0.9497 (2.71)*** | 0.9296 (2.66)*** |
| <i>NGovChg</i> | 0.6950 (2.52)** | | | | | | |
| <i>MinGov</i> | -1.0964 (-1.99)** | | | -1.2241 (-2.16)** | -1.0104 (-1.82)* | | -0.9782 (-1.75)* |
| <i>RSIndex</i> | | -0.5093 (-2.35)** | | | | | |
| <i>GovType</i> | | | -0.4026 (-2.08)** | | | | |
| <i>NPartyGov</i> | | | | -0.3030 (-1.33) | | | |
| <i>SPGov</i> | | | | | -0.1904 (-0.33) | | |
| <i>MajSPGov</i> | | | | | | 1.4687 (2.17)** | |
| <i>CoalGov</i> | | | | | | 0.7109 (1.13) | |
| <i>FragIndex</i> | | | | | | | -0.1656 (-0.54) |
| Log-Likelihood | -115.34 | -114.10 | -114.76 | -114.13 | -115.03 | -114.50 | -114.93 |
| AIC | 248.69 | 246.20 | 247.51 | 248.25 | 250.05 | 249.00 | 249.87 |
| SBIC | 286.80 | 284.31 | 285.62 | 290.60 | 292.40 | 291.35 | 292.21 |
| No. Observ. | 510 | 510 | 510 | 510 | 510 | 510 | 510 |

Notes: The z-statistics for the estimated coefficients are in parentheses. Significance level at which the null hypothesis is rejected: ***, 1%; **, 5%; and *, 10%. The coefficients were estimated using a conditional logit fixed effects estimator.

Table 4. Additional effects from the interaction between the determinants of an excessive deficit

| Prob(<i>Def</i> 3=1) | (1) | (2) | (3) | (4) | (5) | (6) | (7) | (8) |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| <i>PrimGBS(-1)</i> | -0.9278 (-8.61)*** | -0.9371 (-8.32)*** | -0.9225 (-8.54)*** | -0.9557 (-8.31)*** | -0.9374 (-8.51)*** | -0.9184 (-8.55)*** | -0.9281 (-8.65)*** | -0.9254 (-8.58)*** |
| <i>Debt(-1)</i> | 0.0716 (5.66)*** | 0.0748 (5.77)*** | 0.0706 (5.52)*** | 0.0726 (5.53)*** | 0.0715 (5.64)*** | 0.0687 (5.37)*** | 0.0712 (5.46)*** | 0.0703 (5.31)*** |
| <i>GRGDP</i> | -0.3765 (-4.14)*** | | -0.3977 (-4.78)*** | -0.4171 (-4.95)*** | -0.4203 (-4.71)*** | -0.3938 (-4.87)*** | -0.3982 (-4.86)*** | -0.4113 (-4.99)*** |
| <i>ChgUR</i> | | 0.7474 (3.50)*** | | | | | | |
| <i>RIR(-1)</i> | 0.1085 (1.75)* | 0.1264 (1.91)* | 0.1091 (1.78)* | 0.1040 (1.68)* | 0.1001 (1.56) | 0.1151 (1.83)* | 0.1081 (1.64) | 0.1098 (1.66)* |
| <i>D92</i> | -1.0102 (-2.19)** | -0.7826 (-1.77)* | -1.1554 (-2.02)** | -1.1121 (-2.35)** | -0.9873 (-2.15)** | -0.8970 (-1.93)* | -1.1930 (-2.55)** | -1.0887 (-2.32)** |
| <i>D99</i> | -1.2004 (-2.43)** | -1.2143 (-2.39)** | -1.5985 (-2.93)*** | -2.7288 (-3.50)*** | -1.3694 (-2.66)*** | -1.2483 (-2.49)** | -1.2907 (-2.53)** | -1.3170 (-2.54)** |
| <i>Left</i> | 1.0089 (1.74)* | 0.7675 (1.93)* | 0.3716 (0.76) | 0.3389 (0.79) | 0.5089 (1.23) | 1.1857 (2.68)*** | 0.0321 (0.05) | -0.119 (-0.02) |
| <i>Left*GRGDP</i> | -0.0783 (-0.44) | | | | | | | |
| <i>Left*ChgUR</i> | | 0.6408 (1.56) | | | | | | |
| <i>Left*D92</i> | | | 1.4148 (1.74)* | | | | | |
| <i>Left*D99</i> | | | | 2.9306 (2.97)*** | | | | |
| <i>ElectYear</i> | 0.9141 (2.61)*** | 1.0642 (3.00)*** | 0.7334 (1.65)* | 0.6774 (1.74)* | 0.4907 (1.18) | 0.9347 (2.65)*** | 0.9459 (2.70)*** | 0.9819 (2.78)*** |
| <i>ElectYear*D92</i> | | | 0.4512 (0.64) | | | | | |
| <i>ElectYear*D99</i> | | | | 2.1556 (2.11)** | | | | |
| <i>ElectYear*Left</i> | | | | | 1.5307 (2.13)** | | | |
| <i>MinGov</i> | -1.0505 (-1.93)* | -1.3828 (-2.51)** | -0.6228 (-0.98) | -0.9606 (-1.68)* | -1.2055 (-2.16)** | -0.4453 (-0.69) | -1.1592 (-2.02)** | -0.8098 (-1.25) |
| <i>MinGov*D92</i> | | | -1.6136 (-1.72)* | | | | | |
| <i>MinGov*D99</i> | | | | -16.919 (-0.02) | | | | |
| <i>MinGov*Left</i> | | | | | | -1.6298 (-1.80)* | | |
| <i>SPGov</i> | | | | | | | -0.8852 (-1.30) | |
| <i>SPGov*Left</i> | | | | | | | 1.6156 (1.93)* | |
| <i>MajSPGov</i> | | | | | | | | -0.3388 (-0.40) |
| <i>MajSPGov*Left</i> | | | | | | | | 2.1297 (2.48)** |
| Log-Likelihood | -114.98 | -114.42 | -112.56 | -107.70 | -110.30 | -113.43 | -113.08 | -111.28 |
| AIC | 249.96 | 248.83 | 249.12 | 239.40 | 240.61 | 246.87 | 248.16 | 244.56 |
| SBIC | 292.30 | 291.18 | 299.93 | 290.21 | 282.89 | 289.21 | 294.74 | 291.14 |
| No. Observ. | 510 | 510 | 510 | 510 | 510 | 510 | 510 | 510 |

Notes: The z-statistics for the estimated coefficients are in parentheses. Significance level at which the null hypothesis is rejected: ***, 1%; **, 5%; and *, 10%. The coefficients were estimated using a conditional logit fixed effects estimator.

Table 5. Robustness checks

| Prob(Def3=1) | (1) | (2) | (3) | (4) | (5) | (6) | (7) |
|--------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| <i>PrimGBS(-1)</i> | -1.3034 (-5.00)*** | -0.6428 (-4.32)*** | -0.7758 (-3.50)*** | -1.1997 (-5.07)*** | -0.7944 (-6.12)*** | -0.9986 (-5.61)*** | -0.9460 (-5.72)*** |
| <i>Debt(-1)</i> | 0.0599 (3.03)*** | 0.0281 (0.83) | 0.0664 (1.43) | 0.0763 (2.76)*** | 0.0778 (4.60)*** | 0.0798 (4.12)*** | 0.0769 (3.19)*** |
| <i>GRGDP</i> | -0.5018 (-3.65)*** | -0.7895 (-3.45)*** | -0.8851 (-3.17)*** | -0.8070 (-3.56)*** | -0.3266 (-3.57)*** | -0.3376 (-3.02)*** | -0.6907 (-4.22)*** |
| <i>RIR(-1)</i> | 0.2008 (2.07)** | 0.1717 (0.75) | 0.3630 (1.28) | 0.3122 (2.64)*** | 0.0252 (0.27) | 0.1167 (1.26) | 0.0698 (0.42) |
| <i>D92</i> | | | | -0.6082 (-0.68) | -1.6118 (-2.62)*** | -2.0526 (-2.46)** | -0.8877 (-1.34) |
| <i>D99</i> | | -1.7224 (-2.17)** | -2.1307 (-2.16)** | -0.8200 (-0.90) | -2.1255 (-2.82)*** | -2.4183 (-2.83)*** | -1.0147 (-1.31) |
| <i>Left</i> | 1.5550 (1.83)* | 1.4511 (1.85)* | 2.8218 (2.68)*** | 2.3473 (2.20)** | 1.5963 (2.04)** | 3.2750 (3.49)*** | -0.2297 (-0.38) |
| <i>ElectYear</i> | 1.2507 (2.23)** | 1.0114 (1.87)* | 1.7641 (2.52)** | 1.2529 (1.85)* | 0.9970 (2.15)** | 0.6448 (1.19) | 1.3693 (2.73)*** |
| <i>MinGov</i> | -1.4267 (-1.48) | -0.7268 (-0.65) | -2.1538 (-1.69)* | -1.0409 (-0.99) | -1.3475 (-1.78)* | -2.5472 (-2.63)*** | -0.2494 (-0.24) |
| <i>NPartyGov</i> | 0.1210 (0.33) | -0.5974 (-1.77)* | -1.3369 (-3.02)*** | -0.8657 (-1.90)* | 0.0517 (0.17) | -0.2587 (-0.70) | -0.4155 (-1.17) |
| Log-Likelihood | -39.83 | -44.08 | -30.18 | -34.68 | -66.36 | -46.30 | -56.34 |
| AIC | 95.66 | 106.17 | 78.36 | 89.37 | 152.71 | 112.60 | 132.69 |
| SBIC | 123.61 | 134.90 | 105.45 | 120.55 | 191.09 | 147.32 | 168.74 |
| No. Observ. | 243 | 180 | 150 | 167 | 343 | 238 | 272 |
| Time period | 1970-1991 | 1992-2006 | 1992-2006 | 1970-2006 | 1970-2006 | 1970-2006 | 1970-2006 |
| No. Countries | 13 | 12 | 10 | 5 | 10 | 7 | 8 |

Notes: The z-statistics for the estimated coefficients are in parentheses. Significance level at which the null hypothesis is rejected: ***, 1%; **, 5%; and *, 10%. The coefficients were estimated using a conditional logit fixed effects estimator. Regression 1 considers only the period before Maastricht (1970-1991); Finland and Italy were automatically dropped in this regression due to lack of variability of the dependent variable (Finland never presents an excessive deficit during this period, while Italy is always in a situation of excessive deficit). Regression 2 considers just the period 1992-2006; Regression 3 considers the same period but only the countries that took part in EMU. Denmark, Ireland and Luxembourg were dropped in these two regressions due to lack of variability of the dependent variable; in this case, these countries have never had excessive deficits in the period 1992-2006. Regression 4 includes only the 5 largest EU countries and regression 5 includes the remaining 10 ‘small’ countries. Regression 6 includes only the countries that run excessive deficits in more than half of the years in the period 1970-2006 (Belgium, Greece, Ireland, Italy, Portugal, Spain and the UK), whilst regression 7 presents results for the other countries.

ANNEX

A.1. Description of the variables and respective sources

Economic Variables:

- Def3* – [dependent variable] dummy variable that takes value 1 when the government budget surplus (*GBS*) is lower than -3% of gross domestic product (GDP), and 0 otherwise. Source: own computation from *GBS*.
- GBS* – general government budget surplus as a percentage of at GDP market prices (European Commission excessive deficit procedure). Source: European Commission (2007), AMECO database.
- PrimGBS* – primary (excluding interest) general government budget surplus as a percentage of GDP at market prices (European Commission excessive deficit procedure). Source: European Commission (2007), AMECO database.
- PrimTExp* – primary (excluding interest) general government total expenditure as percentage of GDP at market prices (European Commission excessive deficit procedure). Source: European Commission (2007), AMECO database.
- TRevenue* – general government total revenues as percentage of GDP at market prices (European Commission excessive deficit procedure). Source: European Commission (2007), AMECO database.
- Debt* – general government consolidated gross public debt as a percentage of GDP at market prices (European Commission excessive deficit procedure). Source: European Commission (2007), AMECO database.
- Debt_sq* – square of *Debt* ($Debt^2$). Source: own computation from *Debt*.
- GRGDP* – annual growth of real GDP at price levels of 2000 (national currency). Source: European Commission (2007), AMECO database.
- OutpGap* – the output gap is computed as the gap between actual and potential GDP as a percentage of potential GDP at 2000 market prices. Source: European Commission (2007), AMECO database.
- UR* – unemployment rate (Eurostat definition). Source: European Commission (2007), AMECO database.
- ChgUR* – annual change in the unemployment rate ($UR_t - UR_{t-1}$). Source: own computation from *UR*.
- RIR* – real long-term interest rate (deflator GDP). Source: European Commission (2007), AMECO database.
- Infl* – inflation rate; change in the national consumer price index (CPI: 2000=100). Source: European Commission (2007), AMECO database.

Political variables:

- GovParty* – cabinet composition or political orientation of the government. *GovParty* = 1 (hegemony of right-wing parties); 2 (dominance of right-wing parties); 3 (path between left and right); 4 (dominance of left-wing parties); 5 (hegemony of left-wing parties). There is hegemony of left (right) parties in the government when the cabinet is totally composed by left (right) wing parties; when the cabinet is not totally composed by left (right) parties but more than 66.6% are left (right) parties, then there is dominance of left (right) wing parties; finally, when the government is composed by less than 66.6% of left (right) wing parties (but more than 33.3%), then we are in presence of a centre government (path between left and right). Sources: Armingeon *et al* (2005) for the period 1970-2004 and www.electionworld.org for 2005 and 2006.
- Left* – dummy variable that takes value 1 when *GovParty* is equal to 4 or 5, and 0 otherwise. Source: own computation from *GovParty*.
- %Right* – percentage of right-wing parties in the cabinet. Sources: Armingeon *et al* (2005) for the period 1970-2004 and www.electionworld.org for 2005 and 2006.
- ElectYear* – election year is a dummy that takes value 1 in years of general (parliamentary) elections and 0 in non-election years. Sources: Armingeon *et al* (2005) for the period 1970-2004 and www.electionworld.org for 2005 and 2006.
- ElectQ1*, *ElectQ2*, *ElectQ3*, and *ElectQ4* – dummy variables that take the value of 1 in the respective quarter (Q1, Q2, Q3, Q4) in which the election takes place in a particular year, and 0 otherwise. Sources: Armingeon *et al* (2005) for the period 1970-2004 and www.electionworld.org for 2005 and 2006.
- YrBeforeElect* – dummy variable that takes value 1 in the years before elections, and 0 otherwise. Source: own computation from *ElectYear*.

PolCycle – dummy variable that takes value 1 in the first half of the political cycle of a government. Source: own computation from *ElectYear*.

YrAfterElect – dummy variable that takes value 1 in the years after elections, and 0 otherwise. Source: own computation from *ElectYear*.

2YrAfterElect – dummy variable that takes value 1 two years after the previous election, and 0 otherwise. Source: own computation from *ElectYear*.

3YrAfterElect – dummy variable that takes value 1 three years after the previous elections, and 0 otherwise. Source: own computation from *ElectYear*.

NGovChg – number of changes in government per year due to elections, resignation of the Prime-Minister, dissension within government, lack of parliamentary support, or intervention by the head of state. Sources: Armingeon *et al* (2005) for the period 1970-2004 and www.electionworld.org for 2005 and 2006.

RSIndex – Roubini and Sachs' (1989) index for the fragmentation of the political system. *RSIndex* = 1 (one-party majority parliamentary government); 2 (coalition parliamentary government with 2 coalition partners); 3 (coalition parliamentary government with 3 or more coalition partners); 4 (minority parliamentary government). Sources: Armingeon *et al* (2005): 1970-2004; Woldendrop *et al.* (1998): 1970-1995; *The European Journal of Political Research* (several annual issues of political data: 1997-2006):1996-2005; *The Europa World Yearbook* (1996) and *The Statesman's Yearbook* for missing values for Greece, Portugal and Spain: 1973-1995; and www.electionworld.org: 2005 and 2006.

GovType – type of government in office. *GovType* = 1 (majority single-party government); 2 (minimal winning coalition); 3 (surplus coalition); 4 (single-party minority government); 5 (multi-party minority government); 6 (caretaker government). Sources: Armingeon *et al* (2005) for the period 1970-2004 and www.electionworld.org for 2005 and 2006.

MajSPGov – dummy variable that takes value 1 when the government is formed by a single-party with majority in the parliament (*GovType*=1), and 0 otherwise. Source: own computation from *GovType*.

CoalGov – dummy variable that takes value 1 when the government is formed by a coalition with majority in the parliament (*GovType* equal to 2 or 3), and 0 otherwise. Source: own computation from *GovType*.

MinGov – dummy variable that takes value 1 when a minority government is in office, i.e. when *GovType* is equal to 4, 5 or 6, and 0 if the (single-party or coalition) government has majority in the parliament. Source: own computation from *GovType*.

NGovParty – number of parties in the government. Sources: Woldendrop *et al.* (1998) for the period 1970-1995; *The European Journal of Political Research* (several annual issues of political data: 1997-2006 – compiled by Richard Katz, Ruud Koole and Ingrid van Biezen) for the period 1996-2005; The values for Greece, Portugal and Spain over the period 1973-1995 were collected from *The Europa World Yearbook* (1996) and *The Statesman's Yearbook* (several issues from 1974 to 1997); and data for 2006 were obtained from www.electionworld.org.

SPGov – dummy variable that takes value 1 when a single party government is in office, i.e. when *NGovParty* is equal to 1, and 0 otherwise (multi-party governments). Source: own computation from *NGovParty*.

FragIndex – fragmentation index of the distribution of seats in the parliament. $FragIndex = 1/\sum p_i^2$, where p_i is the percentage of seats of party i in the parliament. Source: Armingeon *et al* (2005) for the period 1970-2004 and www.electionworld.org for 2005 and 2006.

Control variables for the EU fiscal constraints:

D92 – dummy variable that takes value 1 in the period 1992-2006, and 0 in the period 1970-1991.

D99 – dummy variable that takes value 1 in the period 1999-2006, and 0 in the period 1970-1998.

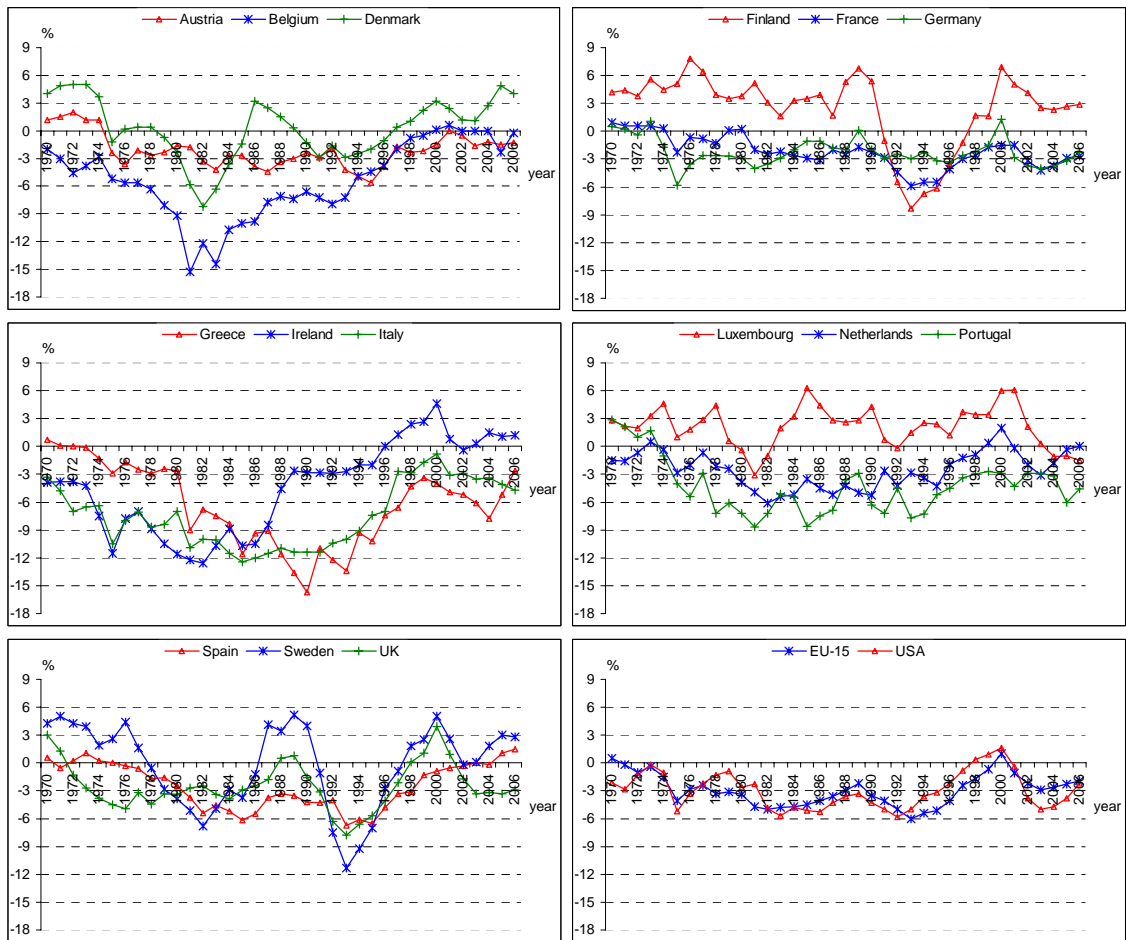
D9298 – dummy variable that takes value 1 in the period 1992-1998, and 0 over 1970-1991 and 1999-2006.

D9298t – time trend for the period 1992-1998; 0 otherwise.

D99t – time trend for the period 1999-2006; 0 otherwise.

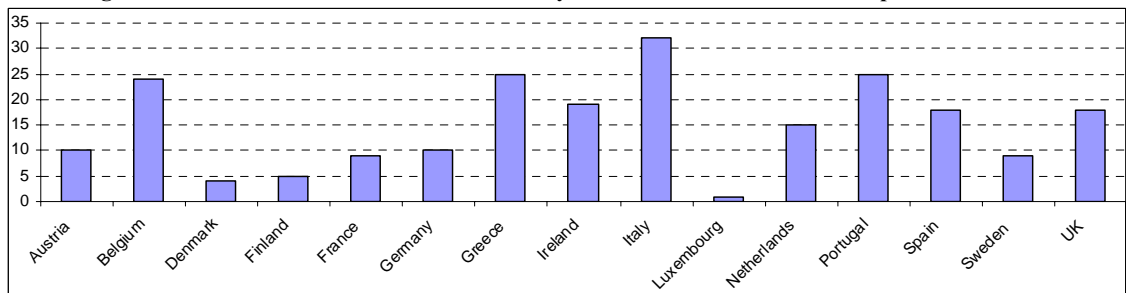
A.2. Figures

Figure A.2.1. Evolution of the government budget surplus (GBS) in the EU countries, EU-area and USA over the period 1970-2006



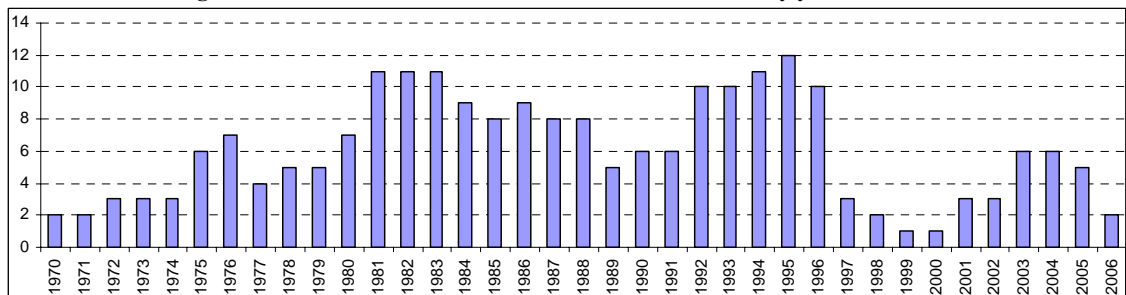
Source: European Commission (2007), AMECO database.

Figure A.2.2. Number of times each EU country is in excessive deficit over the period 1970-2006



Source: European Commission (2007), AMECO database.

Figure A.2.3. Number of EU countries in excessive deficit by year: 1970-2006



Source: European Commission (2007), AMECO database.