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The impact of fiscal rules on Political Budget Cycles before and after the Great Recession - Evidence from the EMU countries

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Vita

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Abstract

This dissertation aims at contributing to the literature on political budget cycles, by analyzing if Economic and Monetary Union (EMU) members are still tempted to manipulate the budget balance for electoral purposes. Despite this feature be a characteristic of developing countries, the political manipulation of certain budget balance categories is found, according to the literature, also in developed countries. We thus test this hypothesis in the EMU countries, while assessing, in addition, the disciplinary role of the adoption of certain fiscal rules on political budget cycles. This application relies strongly on a previous literature overview of the main features of the PBCs theory. Furthermore, we assess how the Great Recession of 2008-2009 changed the political incentives within the EMU and how it shaped the disciplinary role of fiscal rules.

In order to get an overview of our study, our analysis is based on the 19 EMU member states during the period of 1996-2018. In order to deepen our study work we divided our time period in two, being the economic and financial crisis the key moment that separates this period.

We proceed with the estimation of an econometric model using panel data, and as for dependent variables, we considered three levels of budget disaggregation and estimated each regression trough Fixed Effects. Lastly, we controlled for alternative types of fiscal rules.

We concluded that political cycles only appear at disaggregated budgetary levels in these countries on both expenditure (Intermediate Consumption and Compensation of Employees) and revenue (Indirect Taxes) categories; although fiscal rules do not fully prevent electoral cycles, more stringent rules lead to less incentives to promote political cycles on these variables.

Regarding the before and after the global crisis, we found more evidence of fiscal manipulation, which renders in the frequent electoral cycles before 2008, than after 2009.

Resumo

Esta dissertação visa contribuir para a literatura dos ciclos políticos orçamentais, analisando a hipótese de os estados membros da União Económica e Monetária (EMU) se sentirem tentados em manipular a composição orçamental com propósitos eleitorais. Apesar de esta característica ser típica dos países menos desenvolvidos, a manipulação política de certas categorias do saldo orçamental é observada, de acordo com a literatura, também nos países desenvolvidos. Assim, testamos esta hipótese nos países da UEM, avaliando, para além disso, o papel disciplinar da adoção de determinadas regras orçamentais nos ciclos políticos orçamentais. Esta aplicação baseia-se numa visão geral da literatura passada sobre as principais características da teoria dos PBCs. Além disso, avaliamos como a Grande Recessão de 2008-2009 alterou os incentivos políticos dentro da UEM e como moldou o papel disciplinar das regras orçamentais.

De modo a obter um panorama geral do nosso trabalho de estudo, a nossa análise baseia-se nos 19 estados membros da UEM durante o período de 1996 a 2018. De maneira a aprofundar o nosso estudo, dividimos o período da amostra em dois, sendo a crise económica e financeira o momento que os separa.

Prosseguimos com a estimação do modelo econométrico usando dados em painel e, quanto às variáveis dependentes, consideramos três níveis de desagregação orçamental e estimámos cada regressão através do Método dos Efeitos Fixos. Por fim, estudámos os diferentes tipos de regras fiscais.

Concluímos que os ciclos políticos aparecem apenas em níveis orçamentais mais desagregados nesses países - na categoria da despesa (consumo intermediário e remuneração de funcionários) e receita (impostos indiretos); embora as regras orçamentais não impeçam completamente a existência dos ciclos eleitorais, as regras mais rigorosas levam a um menor incentivo de incorrer em ciclos políticos nessas variáveis orçamentais.

Em relação ao antes e depois da crise global, encontrámos mais evidências de manipulação orçamental, que se traduzem na maior quantidade de ciclos eleitorais antes de 2008, do que depois de 2009.

Códigos JEL: D72, E62, P16

Palavras-chave: ciclos políticos orçamentais, política orçamental, regras orçamentais, composição orçamental, EMU.

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Abbreviations

AMECO – Annual Macro-Economic

BBR – Budget Balance Rules

DR – Debt Rules

ECB – European Central Bank

EMU – Economic and Monetary Union

ER – Expenditure Rules

EU – European Union

FEM – Fixed Effects Model

FRI – Fiscal Rule Index

FRSI – Fiscal Rule Strength Index

GCB – German Central Bank

GDP – Gross Domestic Product

GMM – Generalized Method of Moments

IMF – International Monetary Fund

OECD – Organization for Economic Co-operation and Development

RR – Revenue Rules

SGP – Stability and Growth Pact

1. Introduction

According to the Political Business Cycle (PBC) literature, governments create favorable circumstances or, in other words, improve economic outcomes that are more visible/welfare-enhancing to the voters, in order to maximize their votes, so they can increase their chances of being reelected (*e.g*, Nordhaus, 1975; Rogoff and Sibert, 1988; Rogoff, 1990). This perspective is according to one of Downs' (1957a) conclusions that politicians are conducted by their own interests – they act in order to achieve power, revenues and status, and to do that they constrain investment expenditures to current expenditures.

With the Maastricht Treaty and the Stability and Growth Pact (SGP), Economic and Monetary Union (EMU) members are driven by common (and country-specific) fiscal rules and must respect the limit for national budget deficit of 3% of GDP and for public debt at 60% of GDP, unless the ratio is sufficiently diminishing and approaching the reference value at a satisfactory pace. If any country of the EMU breaks one of these rules, they may face an Excessive Deficit Procedure and possible sanctions, which are an example of enforcement mechanisms. Therefore, fiscal rules are created to constrain the behavior of policymakers, by avoiding budgetary indiscipline or expenditure composition bias that can be caused by PBCs, among others. Which brings an interesting point to observe, that is, we want to observe if the occurrence of PBCs is a result from governments' choice to change the budget composition, through revenue or expenditure. As we can see in Santos (2014), governments manipulate the budget composition, while the existence of fiscal rules. She also found evidence that governments' first choices are social transfers, employee compensation and direct taxes. One question arises with this issue - since the occurrence of the Great Recession (2009-10), does this still happen?

One of the main questions of this study is if fiscal rules reduce the impact of PBCs (volatility, budgetary indiscipline, reallocation of expenditures) and then analyze how do (different types of) fiscal rules impact on PBC and fiscal outcomes. In order to answer this question, we must take into account that EU rules show a "contract" amongst the member countries, setting targets for budgetary aggregates and restraining fiscal policy, so that these constraints should avoid manipulation of governments' expenditures and revenues. As we can see in Schuknecht's (2004), he found evidence that although fiscal rules were bent in some situations and compliance is undeniably of concern, fiscal balance problems were avoided in the beginning of EMU.

We expect to answer these questions by reviewing the literature about factors that drive PBC and, in particular, assess, through an empirical application, evidence for the EMU countries during the period 1996 to 2018, in order to verify whether there are differences between the period up to 2008 – the beginning of the Great Recession - and after 2009. Therefore, we estimate an econometric model using panel data of the 19 member states of the EMU, covering the mentioned period. We consider three levels of budget disaggregation and estimate several regressions for the dynamics of alternative fiscal instruments as percentage of GDP – (I) *Net Lending*, (II) *Total Primary Expenditure* and *Total Revenue*, and (III) *Gross Fixed Capital Formation*, *Intermediate Consumption*, *Compensation of Employees*, *Social Benefits*, *Direct Taxes*, *Indirect Taxes* and *Social Contributions Received*. The estimated models are controlled for electoral periods and a composite fiscal rule index in cross terms with standard feedback variables of policy reaction functions besides the electoral dummy. Additionally, we also control for alternative types of fiscal rules: *Debt Rules (DR)*, *Revenue Rules (RR)*, *Expenditure Rules (ER)* and *Budget Balance Rules (BBR)*, so that we can understand the impact of these different fiscal rules on PBCs.

Thus, this dissertation aims to be a valuable contribution to the existing literature by updating a review on the presence and motivation for PBCs in the EMU countries, taking into account, *e.g.*, recent/old democracies, the asymmetric information (voters *vs.* politicians), together with the role of different types of fiscal rules in shaping fiscal performance, namely debt accumulation, and particularly in analyzing the possible effect of the Great Recession on the impact of fiscal rules on PBCs.

This dissertation is organized as follows: chapter 2 shows the historical context of political business cycles and its evolution to budget composition manipulation. This chapter also presents the conditioning factors of political budget cycles, giving an overview of numerical fiscal rules in the EMU. Chapter 3 describes the methodology and econometric model, the data and the analysis of the obtained results of our empirical application to the EMU countries. Chapter 4 summarizes the main conclusions.

2. Literature review

2.1. The theory of Political Business Cycles (PBC)

According to Drahokoupil (2016), PBCs are described as being the result of a stimulation of the economy before the elections, in order to increase the probabilities of the incumbent getting reelected. In other words, we can say that governments are tempted to follow public policies that are supposed to generate benefits to the voters, improving public well-being, in order to be reelected. Thus, they will try to stimulate the economy influencing economic outcomes, so that the incumbent can maximize his votes. Therefore, we can say that there is a correlation between politics and the economy: the cyclicality of politics intensifies the volatility in economic fluctuations.

In a seminal work, Nordhaus (1975) formalized a model describing a PBC. As Downs (1957b), he believed that politicians had no ideological preferences: they act in an opportunistic way, choosing policies to maximize their votes, *i.e.*, they create good conditions before elections, and then, to correct the situation after being elected, they implement contractionary policies. His model assumes that politicians explore the Phillips curve, relying on the fact that voters have incomplete information: as voters are worried about unemployment, governments force a positive shock in the inflation rate so that unemployment decreases previously to the election date. After elections, the incumbent will face a high inflation rate, and, to correct this problem, will thus implement austerity measures, leading to an increase in unemployment. Thus, Nordhaus (1975) relates volatility of inflation and unemployment rates (business cycles) with the rhythm of elections, introducing the concept of PBC (Dubois, 2016).

Unlike Nordhaus (1975), Hibbs (1977) assumes that politicians have different goals/ideologies, so they should behave in a different way, regarding voters' preferences: left-wing parties are more concerned about unemployment and the economic growth, while right-wing parties are more worried about price stability - Partisan Model. The model extends Nordhaus' (1975) in the sense that, although both argue that politicians exploit the Phillips curve, in Hibbs' (1977) model politicians move along the curve according to their political party preferences, meaning that as governments change with parties, it leads to political party-driven cycles.

However, both models were subject to some criticisms, namely: (i) Nordhaus' (1975) assumption regarding the non-existence of different political ideologies between the parties is very strict; (ii) in the last years, in developed countries the central banks became

independent, therefore the government cannot manipulate monetary policy to achieve his objectives; (iii) it is assumed that voters vote for the candidate that maximize their well-being (they are forward-looking), however Persson and Tabellini (1990) referred that they have rational inflation expectations, using all available information in forming these expectations, and hence they explain that information asymmetries could be the why of PBCs.

Later these models were reformulated, incorporating rational expectations and justifying the existence of opportunistic electoral manipulation through the hypothesis of uncertainty and imperfect information concerning the competence of governments. Persson and Tabellini (1990) argued that the trade-off between unemployment and inflation depends on the competence signalized by the government, which is not known by the voters. They describe this concept by saying that, if the incumbent government is competent, they will decrease the unemployment without significantly increasing inflation, and therefore the government boost the economy. However, if he is not competent, the inflation costs will be higher. With respect to their empirical model, they showed that if the government proved to be competent in the last years, they have an incentive to continue this pretense even if they know that it is unlikely to achieve the same goals that were achieved in the past. Possibly, they will implement an economic policy more expansionary than expected before the elections. Consequently, the unemployment rate will decrease, and the voters will be able to see this immediately, unlikely the inflation rate, that will be perceived by the electorate with a delay. In these circumstances, voters will continue to believe in government's competence, and therefore the incumbent will probably win the elections.

Yet, there is the problem regarding the fact that the government cannot control the economy through monetary policy, just as they assumed. So, in the early 90s, Rogoff and Sibert (1988) and Rogoff (1990) highlighted fiscal policy as the main way to control the economy, instead of monetary policy. Furthermore, they also add a difference in their model: it is assumed that the government can have two behaviors, opportunistic and concerned about the public well-being. They presented a model that points to asymmetric information and competence signaled by the government in place (*cfr*. Castro and Martins, 2019). It is assumed that voters are more concerned about personal and public consumption and public investment. So, the competent government starts his expansionary fiscal policy, increasing spending or decreasing the taxes before elections. These benefits will be perceived by the voters immediately, however the cuts on public investment will be observed too late. In other words, the more efficient way to signal the competence is through increasing expenditures that are more visible to the voters, switching from spending that creates long-term benefits

towards more visible spending as it generates short-term benefits. Under this hypothesis, electors fail to have complete information (they are not rational) about the incumbent's competence, because they perceive it with a delay. So, the government creates an illusion of prosperity until the moment voters realize that they must repay the deficit. This means that, only competent governments will signal their competence by putting cycles in fiscal policy, solving the problem regarding the information asymmetry between voters and the government.

Still, we do not see this happening in reality – if the hypothesis regarding the fact that only competent governments start an expansionary policy before the elections, therefore the voters would not substitute the current government by other that they do not know. And this situation does not apply in reality, because politicians, even if they start increasing expenditures or reducing taxes, they can fail in other fields of politics and cannot be reelected.

Regarding the Partisan Models, besides Hibbs' hypothesis (1977), Alesina (1987) added his contribute: the two parties set their monetary policies regarding the trade-off, shown in Phillips curve, between unemployment and inflation. Both parties want to minimize the cost function, however leftist governments will set more weight in employment and growth, while rightist governments will prefer lower inflation rates (they are more worried about price stability). Since the voters are rational, they will create expectations on the probability of election results. This means that there is uncertainty, so the perceived monetary policy after the elections will differ from the expected one. Therefore, the unanticipated inflation will impact the real economy and the unemployment rate.

Alesina and Roubini (1992) studied, for 18 OECD countries during the period 1960-1987, if unemployment and inflation are affected by the timing of elections, and by the shift of economic policies. They use the opportunistic and the partisan model, besides the rational model and concluded that inflation rate tends to increase after elections, maybe due to the expansionary policies before elections, and found evidence of temporary and long-run partisan differences in unemployment and in inflation, respectively.

Nevertheless, these authors assume that government can manipulate monetary policy to chase their goals, which is not true for developed countries, because central banks are independent from the government. Besides that, due to the instability of society's ideology/ways of thinking, if there are changes in the party that is in power, there will be electoral cycles (the change of economic policies leads to fluctuations in the economy due to the elections).

A question remains in the air: can PBC be justified by empirics? As we saw, most of the authors does not reach a consensus – some countries fit in their theories but others not. Yet, we can find stronger evidence in developing countries for cyclical economic policy:

- Labonne (2016) studied the presence of PBCs in the case of 1100 Philippine Municipalities between 2003 and 2009. He used quarterly data instead of year data and found robust evidence for the existence of PBCs, otherwise statistical significance would sharply decrease. He justified this difference by the decline of employment after elections, which it dilutes the yearly effects. His results can be summarized in an increase of 0.87 percentage-points of working-age population that is employed in the two quarters before elections, and a 0.48 percentage-points lower in the two quarters after elections, than what it would have been if there were no elections;

- in support of this hypothesis, Shi and Svensson (2002) studied for 91 countries (developing and developed) during the period 1975-1995 and could observe PBCs in both types of countries, although they found that PBC-effect is more significant in less developed economies. They also found evidence for a significant growth of government spending before elections and a decrease in revenues, which leads to the intensification of deficit in elections years;

- according to Brender and Drazen (2005), evidence of PBC is a common phenomenon in most recent democracies. They found evidence, regarding 106 democratic and non-democratic countries between the years of 1960 and 2001, that when these economies are removed from their sample (only remaining longer-established democracies), PBC disappear. Besides these results, they also found evidence that these cycles are stronger in less developed countries than in developed economies;

- Block (2002) studied 44 African countries during the period 1980-1995 and found strong evidence for cyclical economic policy, verifying regular monetary expansion in election periods – in the election year there was an increase of 4 to 4.5 p.p faster than other years, therefore the inflation rate increased in the following year. So, in this case of developing countries, such as the countries on the sample, monetary policy can still be used to manipulate the popularity of the incumbent, due to the less independency of central banks.

2.2. Political Budget Cycles

In developed countries it is more difficult to find conclusive results, due to a vast list of factors, such as the independency of central banks, which decreases the chances to influence

monetary policy, and so governments, as an alternative, make use of fiscal policy to achieve their objectives and their reelection. Then, they adopt expansionary fiscal policies, through the change of fiscal variables, such as the increase of public spending, budget deficits and the decrease of taxes. This phenomenon is called Political Budget Cycles (Schneider, 2010). Further, according to Franzese and Jusko (2006), political budget cycles occur when incumbents act in an opportunistic way, by improving the welfare of the electorate before elections.

Schneider (2010) referred that political budget cycles are often related with deficit spending in the pre-election period, although incurring in higher deficits is limited by institutional restraints, and besides that, voters tend to penalize governments that do this right before elections. With this, one would think that electoral cycles do not exist in fiscal policies, yet the incumbent has the possibility to take advantage of alternative expenditure policies to achieve his reelection, such as increasing spending on important choices related to elections and reducing others - some scholars, such as Alesina and Roubini (1992) and Franzese (2002), found that social transfers suffered a relevant increase right before the elections.

There are few studies that found evidence of this type of political budget cycles. Akhmedov and Zhuravskaya (2004) found evidence, for the period between 1996 and 2003, of an accentuated increase of transfers in the period before elections for Russian provinces. Alesina and Paradisi (2017) show evidence for the presence of political budget cycles in Italy during the years of 2012 and 2013, through the choice of lower tax rates, by the municipalities when in elections times. Chortareas, Logothetis and Papandreou (2016) studied for 109 Greece's municipalities during the years of 1985 and 2004 and arrived at strong results regarding government's manipulation in pre-election periods, through the higher spending and the excessive borrowing. Kyriacou, Okabe and Roca-Sagalés (2020) studied the mediating impact on political budget cycles within a sample of 67 (advanced and developing) countries, during the period of 1995-2016, finding that these cycles are more likely to occur in less developed countries, whose GDP per capita is below the range between 21000 – 25000 USD. In particular, in lower GDP countries, the increase of discount rates leads the electorate to prefer immediate consumption over the future costs from irresponsible fiscal policies. They explain this, by assuming a capturing role of GDP for the effect of time preference. With this, Kyriacou, Okabe and Roca-Sagalés (2020) show that governments are not limited to deficit spending, moreover they can select other fiscal policy instruments, such as taxation, composition of expenditures, other revenues, etc., in order to increase their voter support during pre-election periods.

The presence of asymmetric information between voters and incumbents can be a relevant factor in the urge of political budget cycles. Regarding this kind of asymmetric information, Schneider (2010) starts by saying that competent governments (the ones that signal their competence by converting revenues into more public goods before elections), as well as incompetent governments are induced by deficit spending, which is considered to be a mechanism out of sight from the voters, in order to run political budget cycles. Adding this to the fact that if certain fiscal policies are not evident and governments do not recognize their own proficiency, then they might increase the fiscal deficit in the attempt that voters relate the higher supplying of public goods to the incumbent's competence. As a result, it is expected that, if the incumbent is not sure about his own competence besides do not knowing how well he will act without changing budget composition, the cycles in expenditure policies are more likely. The same can be said if governments cannot run monetary policies before elections.

However, there is not much evidence to support the existence of cycles in deficit spending. This can be justified by more recent studies, like in Drazen (2000), regarding governments in some circumstances that cannot impact in a negative way their finances in order to affect the economy in pre-elections periods: voters tend to penalize the incumbents whenever they increase deficits in pre-election periods, while assuming that a competent incumbent could increase the expenditure side or decrease revenue side and still not cause the alteration that an incompetent incumbent would induce, therefore governments that do that in a perceptible way might not have political support. If the percentage of informed voter is low, incompetent incumbents find to be more rentable remaining in power. This share of informed voters depends on the level of fiscal transparency – it is described by Kopits and Craig (1998) as the public exposure regarding the organization and roles of the government, his political objectives, public sector accounts and projections. All this information needs to be easy to access, complete, understandable and internationally comparable, in order to the voters and other financial agents can evaluate the government's financial position and the real spending and revenue of his work. If it is high, then the electorate will know when the incumbent increases deficits above average in pre-elections periods. Consequently, the support from the voters will decrease. So, assuming that governments are rational, they will avoid deficit spending before elections. Within this, one can say that deficit spending is less attractive in countries with fiscal transparency systems. Still, there are other fiscal means that governments can use to induce electoral cycles.

There are signs of elections in the expenditures budget's composition – governments raise public expenditure on specific budget items while decreasing on others, so that they can show their competence to the electorate, though they cannot raise deficits in pre-elections times in order to finance public goods provision (due to the fact that deficits are perceived by the electorate). However, in countries with fiscal transparent systems, the incumbents signal their competence when they can decrease deficit growth prior to elections. Thus, electoral cycles in manageable political instruments, such as transfer payments (keeping a stable budget) are applied as a substitute electoral instrument when deficit spending is not enough to create political support. Therefore, the incumbent can spend more on certain budget groups, while reducing spending on other policies, inducing a Political Budget Cycle (Schneider, 2010).

Hence, in countries where deficit spending is improbable (not feasible), it can still occur this kind of political cycles in the supplying of public goods, through the influence of the budget composition, instead of increasing deficit spending. With this, Government can finance more spending in some public goods supply through the reduction of expenditures on not so relevant budget components which are related to the elections, and therefore the incumbent can claim credit for decreasing (or not increasing) budget deficits before elections.

In sum, Schneider's (2010) hypothesis consists in the fact that if there is a high fiscal transparency, there would not be cycles in budget deficits or general spending, although it can be observable a decrease in deficits and a rise in the provision of public goods. Accordingly, the author decided to study the example of German states, during the period between 1970 and 2003, concluding that in countries with strong fiscal transparency, as in Germany, incumbents do not feel motivated to increase deficits in pre-election periods. Schneider (2010) found evidence concerning the absence of increasing deficits before elections, and even found a negative deficit growth which is relevant at the 10% level, which signals the presence of competence when the electorate detect deficits.

Regarding what was said previously, one should not expect budget or expenditure cycles in these circumstances, instead, one assumes that governments will increase public good provision. However, following this strategy, the incumbent can only reach out to one group of the electorate and has to reduce the spending in other budget categories. Nevertheless, the government prefers to target spending if nothing else, since they do not have other alternatives, in most of times. So, Schneider (2010) argument remains in the hypothesis that should exist cycles in targeted expenditures, even if the government cannot raise deficits in pre-elections periods. To test her theory, it was chosen a policy instrument that would bring

economic advantages to the government and could reach to a maximum number of certain groups of the electorate – social security. Therefore, if the author finds evidence for electoral cycles in social security spending, her hypothesis would not be refuted.

These conclusions imply that the incumbent does not rely on fiscal policies to have more support from the electorate, nevertheless, by Schneider's (2010) opinion, cycles in transfer payments may happen. The government can increase spending in social security at the price of other budget categories, to improve the voters' well-being, instead of expanding overall expenditure, which they cannot, and still without signaling incompetence. Analyzing the evidence for this item, it was found an increase by 2% in social security in the pre-election year, although the growth of social security spending on average is 5%. After the Maastricht Treaty took the role to reduce the monetary independency of German Central Bank (GCB), the author observed an increase by almost 4% in social security spending, during pre-election periods. With this, the author concludes that governments can manipulate the budget's composition when they are faced by institutional constraints, which restrain the use of tax or monetary instruments and policies, or budget deficits. That is, the German governments seem to raise the public goods provision at the price of other irrelevant or not visible budget items to the electorate, in the year before elections. Moreover, cycles in social security spending occur only for some states before 1993, which implies that the GCB allowed certain states to conduct monetary cycles before elections.

2.3. The conditionality of composition cycles

There seems to be a consensus on the existence of political budget cycles being context-conditional: it depends on the magnitude, regularity and its tenor on international and domestic politico-economic and institutional conditions. Therefore, there is the necessity to detect the framework behind politicians' incentives to economically manipulate elections, and consequently increase their probabilities to be reelected.

2.3.1. Factors that impact the incentives and the capability of the government to act in an opportunistic way

- Predictability of the timing of elections and electoral competitiveness

When governments know the exact moment that elections will occur, they have more chances to manipulate fiscal policies so they can be reelected. The same do not happen when we talk about snap elections. That is, predictability of election timing can be considered as a pre-condition for electoral manipulation (Shi and Svensson, 2006).

The politicians' incentives to manipulate fiscal policies in order to be reelected can depend on two factors: the probability of the incumbent wining the elections and the possible shift of ideology of the government. Eibl and Lynge-Mangueira (2017) have studied the effects of electoral competitiveness and found that this factor increases the uncertainty over the electoral outcome, and therefore impacts the probability of the occurrence of political budget cycles.

The authors analyzed the impact of democratization on political budget cycles on a large panel of countries during 1960 and 2006. Democratization consists in the increase of executive constraints and the intensification of political competition, which have a different effect on political budget cycles. They show besides the fact that unconstrained executive powers and strong political competition are essential conditions, electoral competitiveness is the element that triggers political budget cycles. In other words, if politicians are not afraid of losing the elections, they do not create political budget cycles. The authors justify this through the empirical covariation between executive restrictions and political competition – "*PBCs occur primarily in hybrid regimes. In full autocracies, there is no incentive to create PBCs; in advanced democracies, incumbents do not have the ability*" (Eibl and Lynge-Mangueira, 2017, p. 24).

- Ideology

And if there was a connection between the opportunistic and partisan models? Frey and Schneider (1978a, 1978b, 1979) studied how the incumbent takes an economic policy decision according to his level of popularity, that is when his popularity is high, the government follows his ideological goals, otherwise, when his popularity levels are low, the incumbent runs expansionary fiscal policies. Efthyvoulou (2011) found that external economic restrictions imposed on the capacity of governments to ingratiate themselves with partisans can reinforce their incentives to generate political budget cycles, by behaving in a non-partisan manner and pursue other policies easier to implement in the short-term. Alesina and Tabellini (1990) also show that if the government in power expects to lose the elections for the opponent party, he could generate a political budget cycles by increasing spending and deficit before elections, limiting the options of his elected opponent. Veiga and Veiga (2007) studied the hypothesis of government ideology alone can affect the magnitude of the political budget cycles and found evidence for Portuguese municipalities that suggests that left-wing governments generate larger political budget cycles than right-wing governments.

- <u>Economic development</u>

Shi and Svensson (2006) found strong evidence regarding the magnitude of political budget cycles among advanced and developing countries, showing that less developed countries are probable to have larger political budget cycles. They assumed that these differences are due to the presence of different politico-institutional features – the incumbent's rent of being in power and the percentage of informed voters, who know to differentiate political manipulation from government's competence. So, they studied a moral hazard model in which the dimension of political budget cycles depends on political rent-seeking (as the incumbent has more benefits of keeping in power, the electoral cycles will be sharper). One of the proxies that were used for rents is the country's corruption index, and as expected, the electoral effect is higher in more corrupt countries and in countries with more rent-seeking activities. Shi and Svensson (2006) also stated that the type of voters (informed – who has access to all available information and can virtually observe the policies implemented by the government - and uninformed – who has not all the information and cannot observe all the aspects of the government's policies) has impact in electoral cycles, and could conclude that higher shares of informed voters lead to smaller political budget cycles.

Brender and Drazen (2005) also found evidence for the existence of political budget cycles in their sample of non-democratic countries. Their findings can be justified by the fact that more established democracies are less likely to generate fiscal cycles, because in this type of economies, voters are better informed concerning government's fiscal policies and besides that, they have more experience with previous elections, thus they process the past information and, therefore they are less likely to reward fiscal deficits.

- <u>Constitutional features</u>

Persson and Tabellini (2000, 2002, 2003) made some studies regarding the purpose of diverse electoral rules (majoritarian vs. proportional rules in legislative elections) and government types (parliamentary vs. presidential regimes) and found that in majoritarian systems there is stronger individual responsibility, due to the fact that electoral outcome is more sensitive to marginal changes in votes and, besides that, voters prefer to vote for individual candidates instead of party lists. Within this, the incumbents have more incentives to show their competence to the voters, which results in large tax and spending variations. On the other hand, in the perspective of proportional rules, the incumbent seeks support from huge groups of the electorate and, thus is more motivated to collect votes through extensive policy

programs, such as spending on well-being, while under majoritarian rules, there are more incentives to implement policies to certain voters. Regarding the government's form, the authors found that the executive's character (individual or collective) is what divides presidential and parliamentary governments. In presidential governments the elections are direct and separated for the purpose of choosing the executive and legislative categories. Thus, even though the legislature cannot overthrow the executive (as in a parliamentary governments), the last one is directly responsible to the electorate. So, we can say that it is more likely to occur stronger electoral cycles under presidential regimes, assuming that the power of political budget cycles is dependent of electoral accountability.

Persson and Tabellini (2003) studied these predictions during the period of 1960 and 1998 for 60 countries and, in accordance with the perspective that majoritarian and proportional regimes stimulate accountability and representation, respectively, they found that electoral cycles in taxes and general expenditures are more perceptible in the first regime, while the intensifications of well-being spending driven by elections are only noticeable in the second regime. Furthermore, they found signals of the impact regarding the period after elections in public spending and taxes in countries with presidential systems and no evidence in countries with parliamentary systems. These findings can be interpreted as in presidential systems, before elections, the executive is less able to induce fiscal expansions or tax decreases (since the accentuated powers division), however he may delay some unwanted fiscal modifications (from the voters point of view) until the end of elections (due to veto powers).

Chang (2008) provided evidence regarding he occurrence of electoral rules impact on the expenditure composition, near to elections time. The author focused on OECD countries and demonstrate that there is an increase of social welfare spending in pre-elections periods under proportional representation, while in majoritarian regimes, in specific districts, the incumbent increases investment spending, such as construction and transport spending.

- Rent extraction, re-candidacy and term limits

Scholars, like Shi and Svensson (2006), agree with the idea of that institutional environment is a significant contextual characteristic for what concerns political budget cycles, as it can affect incumbents' rent of keeping in power.

According to rational political budget cycles hypotheses, it is expected that incumbents who do not re-candidate, are reluctant to signal their competence and therefore, do not have opportunistic behavior. Aidt, Veiga and Veiga (2011; p.23) used data for Portuguese municipalities and found empirical evidence for this theory – "*The empirical results clearly support*

the hypothesis that opportunism pays off, as greater expenditures in the election year (when compared to the election term average or, simply in euros per capita) lead to greater vote differences between the incumbent and her main opponent". Through the reduction of rents from keeping in power, term conditions can equally reduce the motivation for politicians inducing political budget cycles. In line with this, Klein and Sakurai (2015) found empirical evidence for the effects of term conditions regarding political budget cycles, focusing on local and state government, and could determine that political budget cycles are less pronounced in regimes where term limit laws are applied.

- Fiscal rules

The implementation of a rigid fiscal system and specifically fiscal rules influence the occurrence of political budget cycles. In other words, one can say that budget balance requirements may limit politicians' capability to influence fiscal policy for electoral advantages.

Rose (2006) found evidence for the American states for the hypothesis that strict balanced budget rules diminish political budget cycles. In this study it was employed rules that are not persistent (they control which states cannot extend deficits in the following year). The author could conclude that in states without persistent rules are less likely to occur political budget cycles, than in the others. Besides that, comparing strong and weak "no-carry" rules, it was found that throughout election years states under firm rules had practically no variation in budget composition. On the other hand, states under weak rules, it was observed a change in the budget balance with a variation of half of that of states with no rules. The author also found evidence, for the employed sample, that political budget cycles were frequently driven by expenditure-side cycles.

Tsai (2014) analyzed, for 46 American states during 1977 and 2008, if the presence of fiscal rules could cause the manipulation of public spending in a disaggregated way, transferring spending from less evident budget subcategories to more perceivable subcategories for electoral reasons. His evidence indicates that fiscal rules acting alone do not prevent budget's manipulation at a disaggregated level, since are still seen relocations from and to numerous subcategories before elections. Yet, the empirical conclusions show that there is a reduction of these manipulations as "carry over" rules become stricter, indicating that balanced budget rules are efficient at a disaggregate and aggregate levels.

Mink and De Haan (2006) analyzed the theory that there were political budget cycles in the Euro Area-12 countries, although the presence of the Stability and Growth Pact (SGP). This

study was between 1999 and 2004 and they could conclude that SGP was too weak to deter the incumbent from inducing expansionary policies in pre-election periods.

Efthyvoulou (2012) examined the occurrence of political budget cycles in fiscal policy variables in the European Union-27, by the observation of their differences during the period of 1997-2008 and assessing the possibility of differences among countries as a result of institutional differences. The main conclusion was the confirmation of the presence of political budget cycles in the EU-27, which was determined by the Eurozone countries. The author justified this by the fact that countries that do not belong to the Euro prefer a combination between fiscal and monetary measures to induce political budget cycles.

Nerlich and Reuter (2013) studied, at a disaggregated level, the effects of numerous types of fiscal rules on fiscal discipline for the EU27 countries during the period between 1990 and 2012. They concluded that when fiscal rules are applied, there is an improvement on primary balance. They found several fiscal rules, which have a stronger impact on budget categories, such as social benefits, employee compensation – all with a great interest from a political budget cycles point of view.

Gootjes, Haan and Jong-A-Pin (2019) investigate if fiscal rules constrain incumbents to use fiscal policy in order to be reelected. They used data on fiscal rules provided by the IMF for 77 developed countries during the period 1984-2015, and it was found that, after the 2007-2009 financial crisis, political budget cycles occur only in countries with weak fiscal rules. Besides that, the authors also found that fiscal rules in overall lead to more positive budget balances. With this, they confirm that fiscal rules can decrease the probability on the occurrence of political budget cycles.

Eklou and Joanis (2019) studied the causal effect of fiscal rules on political budget cycles for 67developing countries during the period of 1985-2007, through the analyze of the geographical pattern in the implementation of fiscal rules (thus, they can see if the limitation that fiscal rules may stablish on discretionary fiscal policy is binding in election years) in order to isolate an exogenous variable in the adoption of national fiscal rules. The authors conclude that in election periods, in the presence of fiscal rules, public spending decreased when compared to election periods in the absence of fiscal rules, meaning that fiscal rules matter for fiscal discipline. They also found that fiscal rules are more effective depending on their type, institutional design, time of adoption and the level of competitiveness of elections.

According to European Central Bank (2019), in European Economic and Monetary Union (EMU), fiscal policies, which are under the accountability of national governments, are used

to complement the single monetary policy. These budgetary policies are subject to a mutual set of fiscal rules and country-specific arrangements, yet it appears that there is not an agreement of the impact of these fiscal rules on the occurrence of political budget cycles. So, according to the European Commission[1], there is the necessity to consolidate the fiscal framework in EU member states as they regard it as a significant factor in reducing the deficit bias.

2.4. Fiscal rules and political budget cycles

Unlike the United States and Switzerland, the Euro Area does not have a history of balanced budget rules, nor a lower or less diverse government debt ratio. In order to achieve their position, the EU's fiscal framework must be more efficient in decreasing the weight of national government debt burdens, so the EMU members can be more protected from economic fluctuations and the Euro Area stronger.

Domestic fiscal frameworks are characterized by "*the set of elements of the institutional policy setting that shape fiscal policy making at the national level. They comprise the arrangements, procedures and institutions governing the planning and implementation of budgetary policies.*" European Commission (2010, p. 73). As examples of frameworks, there are numerical fiscal rules, independent fiscal institutions, medium-term budgetary frameworks and budgetary measures guiding the implementation of budget programs. Besides the existence of a global institutional framework, the keys to ensure the application of fiscal rules and their efficiency are fiscal institutions and enforcement mechanisms.

Fiscal governance, among other objectives, aims to decrease short-term methods to generate fiscal policy, which avoids incumbents to run political cycles – "*Fiscal rules are an essential part of the fiscal frameworks needed to achieve sound public finances*" (European Central Bank, 2019, p. 3). Thus, this dissertation emphasizes the effects of different types of fiscal rules on the existence of political cycles.

Based on Halac and Yared (2018), p. 2305, fiscal rules are considered as being "*deficit limits that trade off commitment to not overspend and flexibility to react to shocks*" with the main objective of implementing budgetary discipline and macroeconomic stabilization. In European Central Bank (2019) it is referred that it is very important to have sustainable fiscal positions in a

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[1] https://ec.europa.eu/info/business-economy-euro/indicators-statistics/economic-databases/fiscal-governance-eu-member-states/what-fiscal-governance_en.

monetary union, since individual countries cannot apply monetary and exchange rate policies to react to country-specific shocks. One of the instruments that are commonly used to achieve sound fiscal policies are numerical fiscal rules. Their role is very important, as they guarantee sustainable public finances, by solving deficit bias, through the increase of deficits and public debt ratios in developed countries attributed to politicians' short sightedness and the "common-pool problem", and pro-cyclicality in fiscal policy with incumbents spending too much in economic upturns periods (Casals, 2012).

2.4.1.   Fiscal rules in the Euro Area

As it was said, according to the European Central Bank (ECB) (2019), in a monetary union it is essential to have sustainable fiscal framework. As we could see in the last European sovereign debt crisis, unstable fiscal rules in a certain country might result in spillover effects on other countries and, therefore, it will impact the monetary union. In order to achieve sound fiscal policies, it can be used numerical fiscal rules, which are also an essential element to guarantee sustainable public finances. In recession cases, if fiscal rules are little flexible, they could limit countries' ability to stabilize. Thus, it is imperative the existence of structural fiscal rules (which adjust the effects of cyclical variations) so that they guarantee that fiscal policies have a countercyclical behavior along the business cycle.

The rationale for fiscal rules is to limit the use of policy discretion to obtain sound budgetary policymaking besides contradicting the disposition of politicians to consent deficit and debt growth.

In the European Central Bank article (2019), it is informed that fiscal policies in the Eurozone are conducted by supranational and national fiscal rules. In the first case, these countries are under nominal fiscal rules with the SGP (limit of 3% of the deficit-to-GDP and 60% of government debt-to-GDP). Besides that, these rules are also essential to achieve and preserve the medium-term budgetary purposes of each country, which are defined according the structural balance (reveals the budgetary position of the country, which filters the effect of the business cycle and one-off factors on the budget composition). Unlike the United States and Switzerland, the implementation of supranational rules is made on national fiscal policies and not to the federal budget. Currently, at a national level, fiscal rules are determined by a fiscal agreement, which calls for countries to apply a certain rule in order to guarantee a balanced global government budget in structural terms in a medium term, and an adjustment instrument that must be automatically activated in existence of fiscal target bias.

According to the [2]European Central Bank, during the last 20 years, in the Euro Area, there was an increase of the number of fiscal rules (from 20 in the beginning of the century, to 62 in the present) – reflecting in specific an intensification in balanced budget rules. Countries have arranged various types of fiscal rules:

- Balanced budget rules increased from 10 in 2000 to 35 by 2017, accounting for almost 60% of all rules, since they are associated to the superior budgetary results and address the deficit bias (European central Bank, 2019). Despite the fact they have a positive impact on budget composition, these rules could cause more pro-cyclical policies and therefore can be risky to macroeconomic stabilization (Debrun, Moulin, Turrini, Ayuso-i-Casals and Kumar, 2008). A possible solution may be to implement cyclically adjusted budget balance and structural fiscal rules.

- Debt Rules have become more established over the past 20 years, accounting for 25% of all rules. The main instruments used in Debt Rules are debt service-to-current revenue and debt-to-GDP targets (European central Bank, 2019). According to Casals (2012), the principal problem of Debt Rules remains in the fact that, while national rules set objectives to debt levels, the evolution of debt is not considered.

- Expenditure and Revenue Rules, unlike the others, have a limited role in most countries of the Euro Area. Regarding the first ones, these have two main goals – discipline governments' primary spending and avoid pro-cyclical budgetary policies (European central Bank, 2019). Further, according to Casals (2012), Expenditure Rules are the strictest, having the ability to deter governments' political and electoral intentions behind fiscal policies. On the other hand, being the least common, Revenue Rules have as the main objective to avoid pro-cyclical policies.

Besides the increase in the number, in the article of the European central Bank (2019) we can see that fiscal rules have improved in some qualitative terms, such as in:

- Strictness – recently, rules became reinforced, by setting them at a constitutional level, helping to decrease the risk of short-sighted discretionary fiscal policies, which are frequently associated with the accumulation of high public debt.

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[2] https://www.ecb.europa.eu/pub/economic-bulletin/articles/2019/html/ecb.ebart201903_02~e835720b96.en.html#toc3

- Coverage – each Euro Area country, currently, has at least one fiscal rule that limits the public finances at the general government level, unlike the early years of the Eurozone, when most rules only controlled a little the general government sector.

- Plausibility – now, the Eurozone countries apply at least one fiscal rule that takes account of the effects of cyclical developments. Previously, countries were only constrained by ceilings in nominal terms.

- Monitoring – the monitoring of compliance with fiscal targets has been reinforced in all Euro Area countries with independent fiscal authorities.

- Inherent correction mechanisms – fiscal rules are more and more supported by more credible enforcement mechanisms.

The majority of these improvements in national fiscal rules happened in the current decade, as a result of significant institutional changes at the supranational level, such as the transpose of the fiscal compact into the national legislation, in order to increase the national ownership of the EU governance framework – in contrast, in the beginning of EMU, national fiscal rules were independent of others countries' fiscal rules (European central Bank, 2019).

Consequently, now, national fiscal rules have more similarities across countries, as well as they have better alignment with the EU governance framework at supranational level. That is, each country of the euro area has, currently, a balanced budget rule in place limiting the general government budget. However, we continue to see differences across countries regarding fiscal rules framework, which reflects national preferences, different federal structures and the effectiveness in terms of compliance of fiscal rules (European central Bank, 2019).

2.4.2. The Fiscal Rule Index

The European Commission counts on the fiscal rule index (FRI) to evaluate the possibility of institutional system, where fiscal policies are conducted, is associated with an environment of compliance with fiscal rules. As referred in Santos (2014), FRI determines how far a fiscal rule is required and takes into account the effect of various institutional features, such as:

- the room for setting/revising its goals (rated on a scale of 1 indicating complete control in setting objectives, to 3 indicating no margin for revising objectives);

- the rule's statutory base (rated from 1, meaning that a fiscal rule is approved by political commitment by a certain authority, to 4 meaning that a fiscal rule is preserved in the national constitution of a member state);

- the media visibility of the rule (from 1 indicating no interest of the media in rule compliance, to 3 indicating that the media is closely monitoring rule compliance);

- enforcement mechanisms of the rule (rated in a scale of 1 indicating the lack of any of these mechanisms, to 4 indicating the presence of automatic adjustment and mechanisms that penalize, in the case of non-compliance with the rule);

- the body in charge of monitoring the respect and implementation of the rules (assessed by 2 separating ratings – both from 1 indicating no regular supervision regarding rules or absence of an authority that enforces, to 3 indicating that this is done by an independent institution).

Combining the above-mentioned scores into one composite index, we can obtain the Fiscal Rule Strength Index (FRSI). The FRSI's are weighted in conformance with the fiscal rule's coverage of government finances, and with this, the European Commission calculates the FRI, through the aggregation of the scores of each country per year. The construction of FRI is based on the presence of different rules that cover the same government sub-sector, by giving different weights to fiscal rules regarding their force. Concerning the interpretation of its values, if the value is very low (high) that means that there is a weak (high) fiscal rule compliance and an unsecure (tighter) fiscal system.

Currently, the trend is clear, as it can be shown below (Figure 1) – the increase of fiscal efforts in the last years led to a more fiscal compliance in the EMU, meaning that the occurrence of fiscal cycles in the Eurozone would be more difficult. Furthermore, we can see in Figure 2, after the great recession, there was a FRI reinforcement in most countries, supporting even more the conclusion of Figure 1.

FRI

Mean of FRI

Year
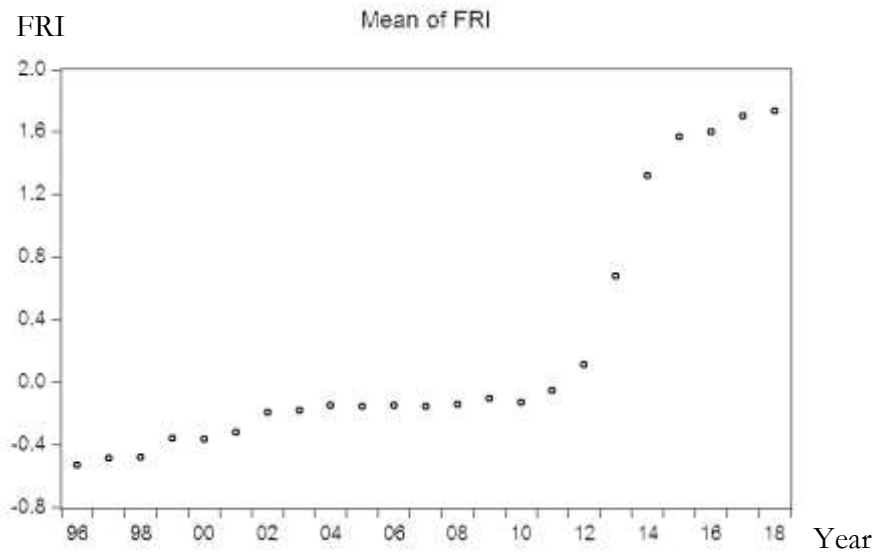
[3]Figure1 – Combined mean of FRI over time
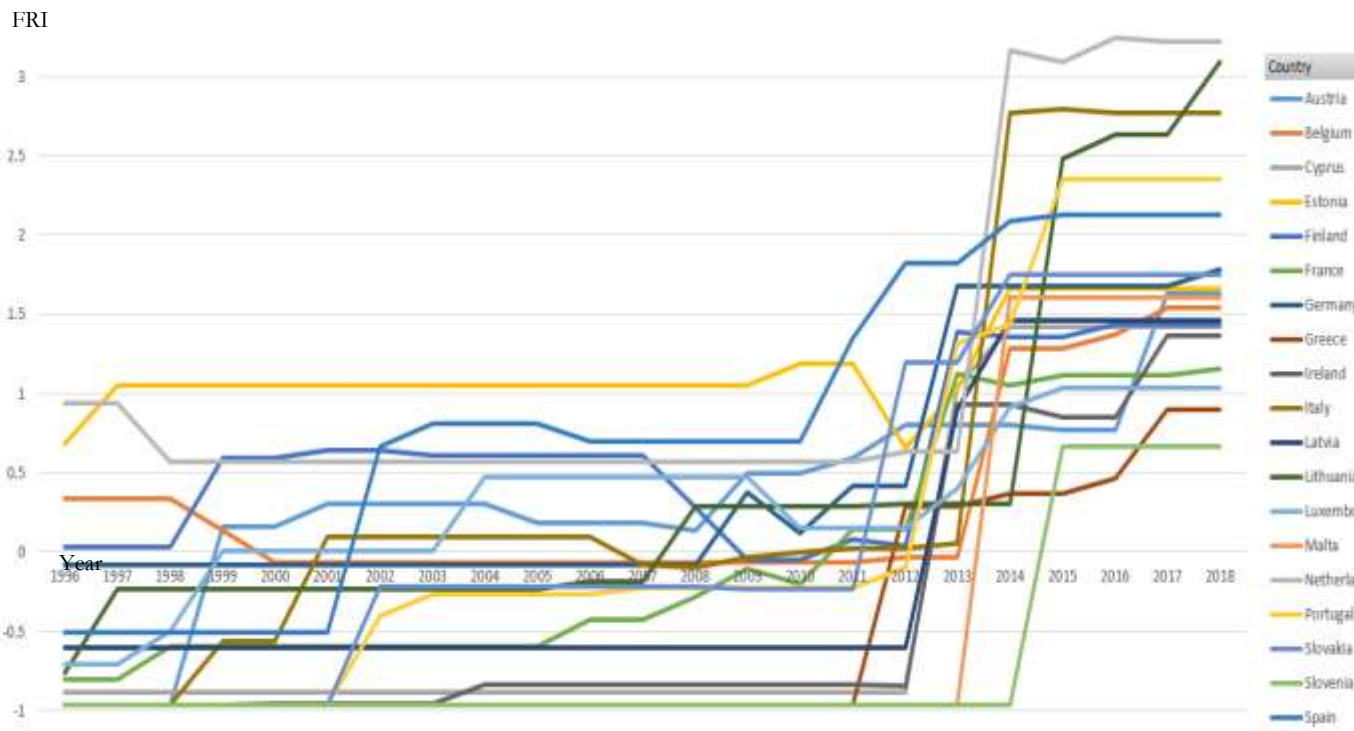
Figure 2 – FRI by member state

[3] Source:
Figures 1 and 2 are based on European Commission database -
https://ec.europa.eu/info/publications/fiscal-rules-database_en

3. Rules and political budget-composition cycles: an empirical application to the EMU

One of the main objectives of this work is to analyze if, among the Economic and Monetary Union (EMU) members, there is the temptation to manipulate certain budget groups for re-election purposes, and if that behavior changed after the Great Recession of 2008-09. Moreover, we want to address how effective are fiscal rules in preventing such opportunistic behavior, by extending a baseline model with the inclusion of data characterizing fiscal rules. In section 3.1 we make a first approach to the data used in the empirical application. In section 3.2, we present the empirical model and methodology. In section 3.3 we analyze the results from estimations.

The empirical analysis will involve the 19 member-countries of the EMU with annual data covering the period from 1996 to 2018. First, we proceed with the whole sample and then we split the sample into two in order to compare the period before and after the economic and financial crisis of 2009; the crisis had an important impact on European economies, leading to several sovereign crises and thus imposing different constrains on fiscal policy.

Data used in this study is collected from several sources: Economic and demographic data is taken from the European Commission AMECO database[4]; political and electoral data from the [5]International Institute for Democracy and Electoral Assistance (International IDEA); regarding fiscal rules data, as the FRI and other data on the various types of fiscal rules, it is taken from the [6]European Commission.

3.1. A first approach to the data

In this section, we first make an approach to the public finance of the EMU members, describing the evolution of net lending and the budget's composition.

3.1.1. Net lending

From the inspection of Figure 3, it can be seen that most of the Member States experienced a huge break in 2007 - 2010, as the crisis made a structural break on net lending common to

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almost every country (with the exception of Malta), resulting in an excessive deficit. Indeed, from then onwards, an increase in the net lending in most of the countries occurred, which can be explained by the fiscal correction measures of the multilateral adjustment programs and a new sense of fiscal responsibility in countries without these types of programs. However, there are some differences across EMU countries regarding the evolution of net lending-to-GDP. Some countries have experienced, predominantly, excessive deficits, like Malta, Greece, Italy, Portugal, Austria, Spain, Belgium, Latvia, France, Lithuania, Slovenia and Slovakia, while others experienced mostly budget surpluses, like Luxembourg and Finland. Others, such as Estonia, Germany, Ireland, Cyprus and Netherlands do not have a predominant trend in their fiscal balance.

Another interesting point is to compare the dynamics the Fiscal Rule Index (FRI) of each member state with the average behavior of its fiscal stance. Figure 4 plots the evolution of FRI among the EMU countries.

From visual inspection comparing Figure 3 with Figure 4, it can be said that most of the countries that have, on average, positive values of FRI have predominance of budget surplus (however there are exceptions, *e.g.*, Belgium and Austria), while countries that exhibit negative FRI experience, predominantly, fiscal deficits. Thus, we conjecture that fiscal rule compliance impacts positively on the fiscal balance of the countries.
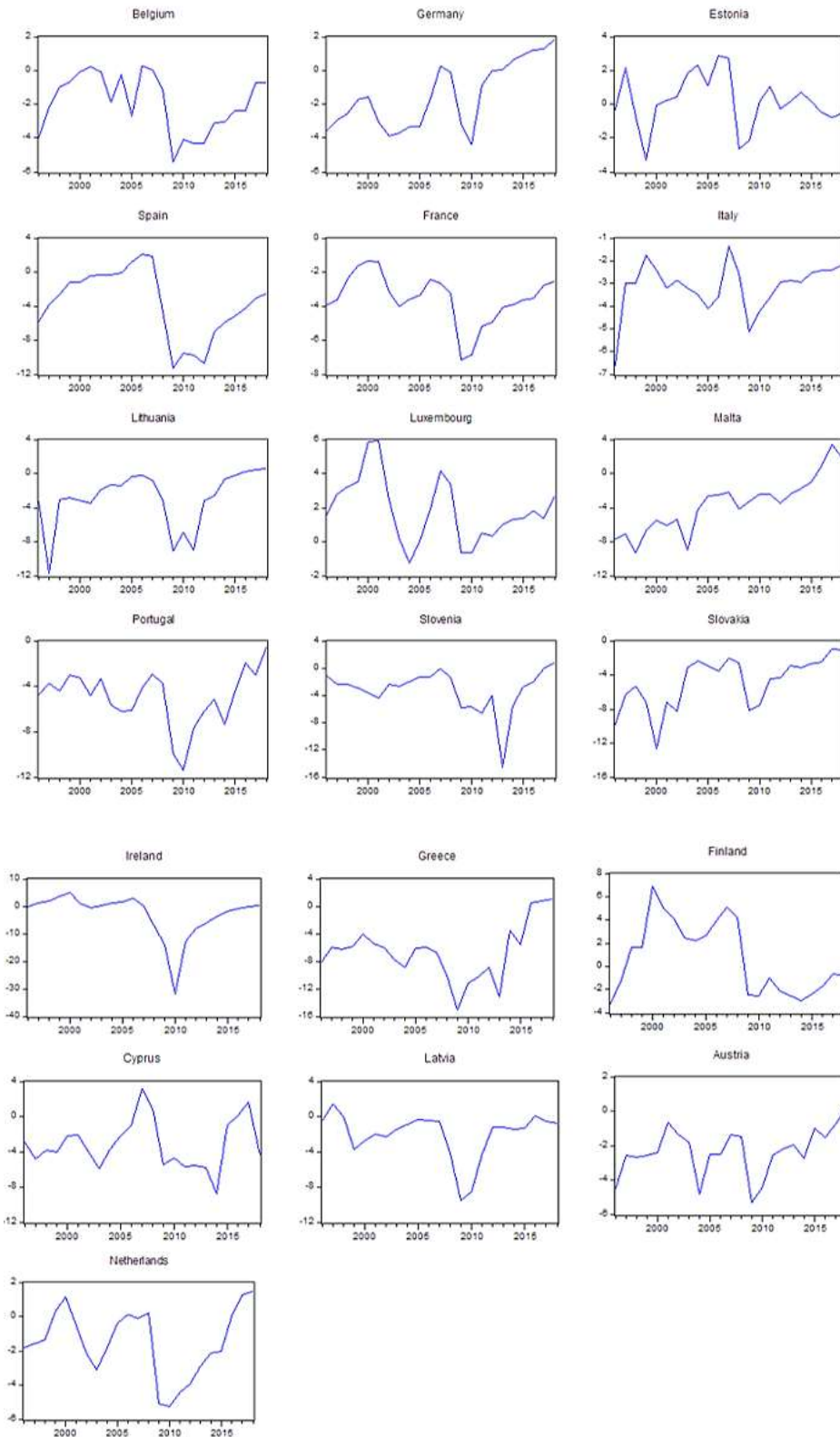
[7]Figure 3 – Net lending to GDP

[7] Source:
Figures 3, 5 and 6 – European Commission AMECO -
https://ec.europa.eu/economy_finance/ameco/user/serie/SelectSerie.cfm
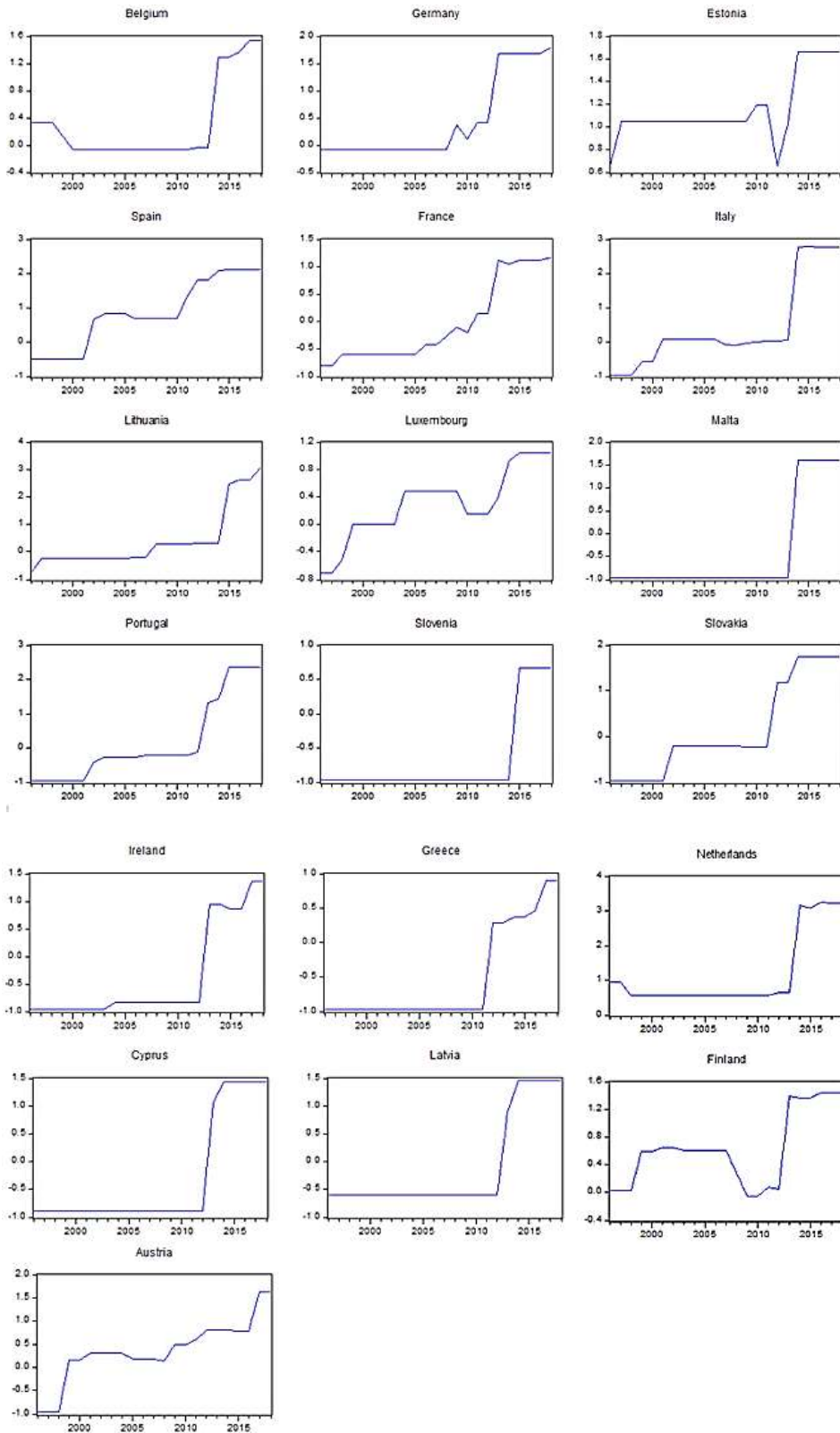
[8]Figure 4 – Fiscal Rule Index

Another conclusion that can be taken is that, for most of the countries, the most important improvement on the FRI occurred after the great depression.

3.1.2. Evolution of budget composition

Expenditure

In order to understand the trend and fiscal-composition preferences of each member state, Figure 5 shows the expenditure composition evolution by country. Each expenditure component (Compensation of Employees, Intermediate Consumption, Gross Fixed Capital Formation and Social Benefits) is presented as a fraction of *Total Primary Expenditure* (for instance, Compensation of Employees/Total Primary Expenditure).

It is clear that some countries maintain their expenditure composition relatively constant across time (Belgium, Germany, France, Luxembourg and Austria). In these countries, on average, Social Benefits represent 30% - 40% of Total Primary Expenditure, Compensation of Employees accounts for 20% - 30%, Intermediate Consumption for 10% to 15%, while Gross Fixed Capital Formation only represents 5% to 10% of *Total Primary Expenditure*. Although Germany and France have maintained their trend relatively constant, Germany has been decreasing the weight of Social Benefits while increasing that of Intermediate Consumption across time, while France has been decreasing the weight of Compensation of Employees in favor of Social Benefits.

In the case of Italy, Netherlands and Finland, their charts show little fluctuations in the relative importance of each category, but exhibit some changes in the trend. For instance, in Italy, Social Benefits slowly decrease their weight on *Total Primary Expenditure*s, while around 2006, their importance started to increase. Since 2007, Finland has been increasing Social Benefits and decreasing the Compensation of Employees. Netherlands started with an accentuated decrease in their Social Benefits and, around 2009, they increased from 25% to almost 30%. The other expenditure categories remained relatively similar to the categories of the countries described above.

The remaining countries exhibit strong fluctuations, although some of them display a pattern regarding the weight of fiscal categories in *Total Primary Expenditure*. This is the case of Slovenia and Slovakia.

After 2008, there was an increase in Social Benefits in almost every country (exceptions are Belgium, Germany, Austria and Malta), which was compensated by a decrease in other expenditure categories. For instance, Luxembourg, Italy, France and Finland opted to decrease in Employee Compensation. Spain, Ireland, Greece and Cyprus reduced their expenditure with Gross Fixed Capital Formation, while Portugal, Netherlands, Lithuania, Latvia opted to decrease in both categories.
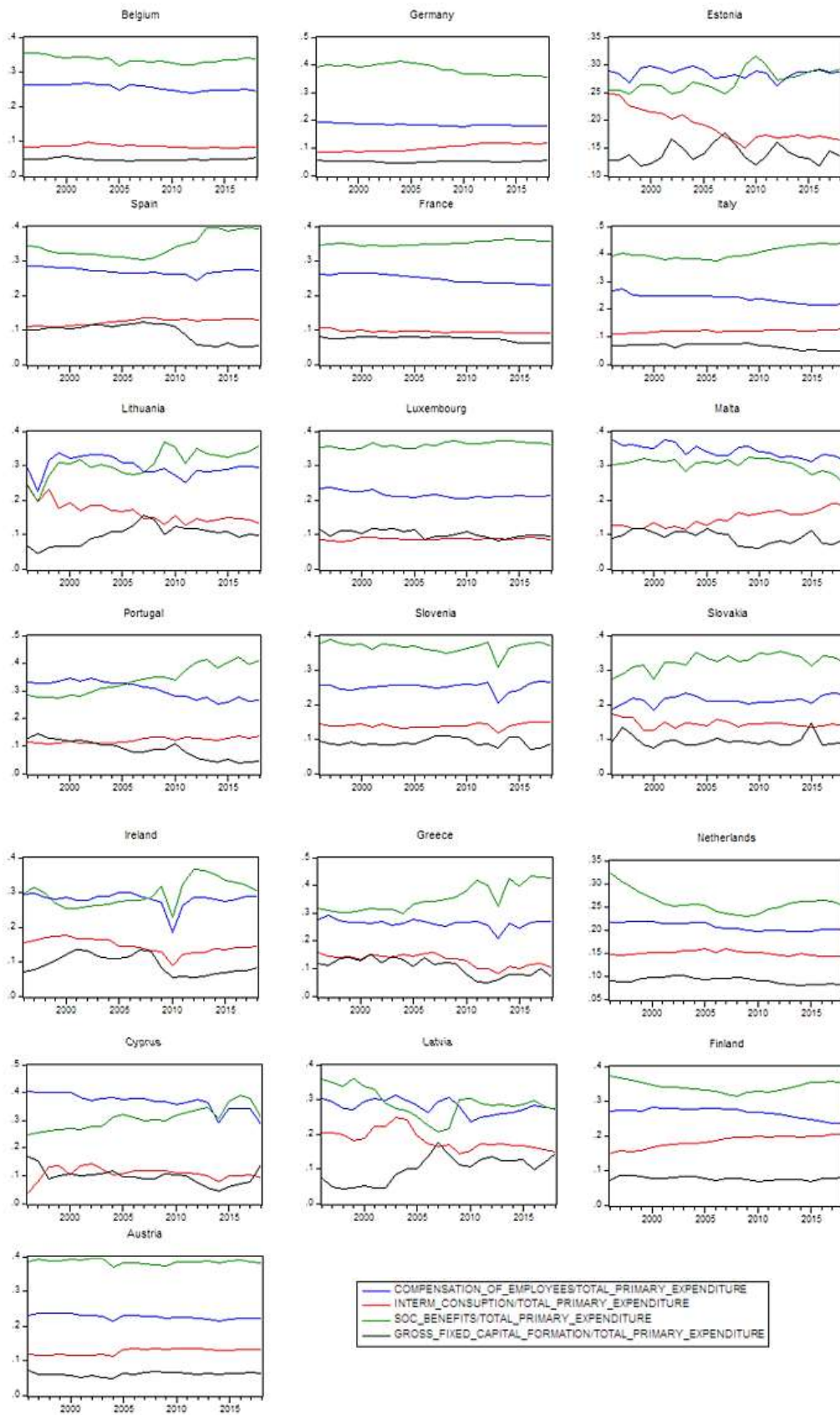
Figure 5 - Expenditure categories as fraction of primary expenditure

Revenue

Figure 6 exhibits the evolution of revenue composition and, at a first view, we notice more volatility within this category than within expenditure. Each revenue component (Actual Social Contributions, Direct Taxes and Indirect Taxes) is presented as a fraction of Total Revenue (for instance, Direct Taxes/Total Revenue).

It is clear that some countries clearly prefer some sources of revenue to others. For example, Spain, France, Slovakia, Netherlands and Germany rely more on Social Contributions, while in Portugal, Greece, Cyprus, Latvia and Estonia, indirect taxation is more important. In Slovenia, Lithuania and Austria, both categories have more or less the same weight. In Luxembourg, Finland and Belgium, Direct Taxes are the main source of revenue. In Malta, Ireland and Italy, Direct and Indirect Taxes have roughly the same weight in Total Revenue.

In most countries, we can see some fluctuations around a relative stable trend; however, in other countries there is a clear change in revenue composition – for example, in Italy, Netherlands, France and Finland there has been a strong effort to make revenues more equally distributed across components.

In general, Direct Taxes seem to be the category which exhibits more volatility. This could be due to the fact that this category has a predominant role as an automatic stabilizer, as well as it is easier to manipulate, producing immediate and fairly expected results.
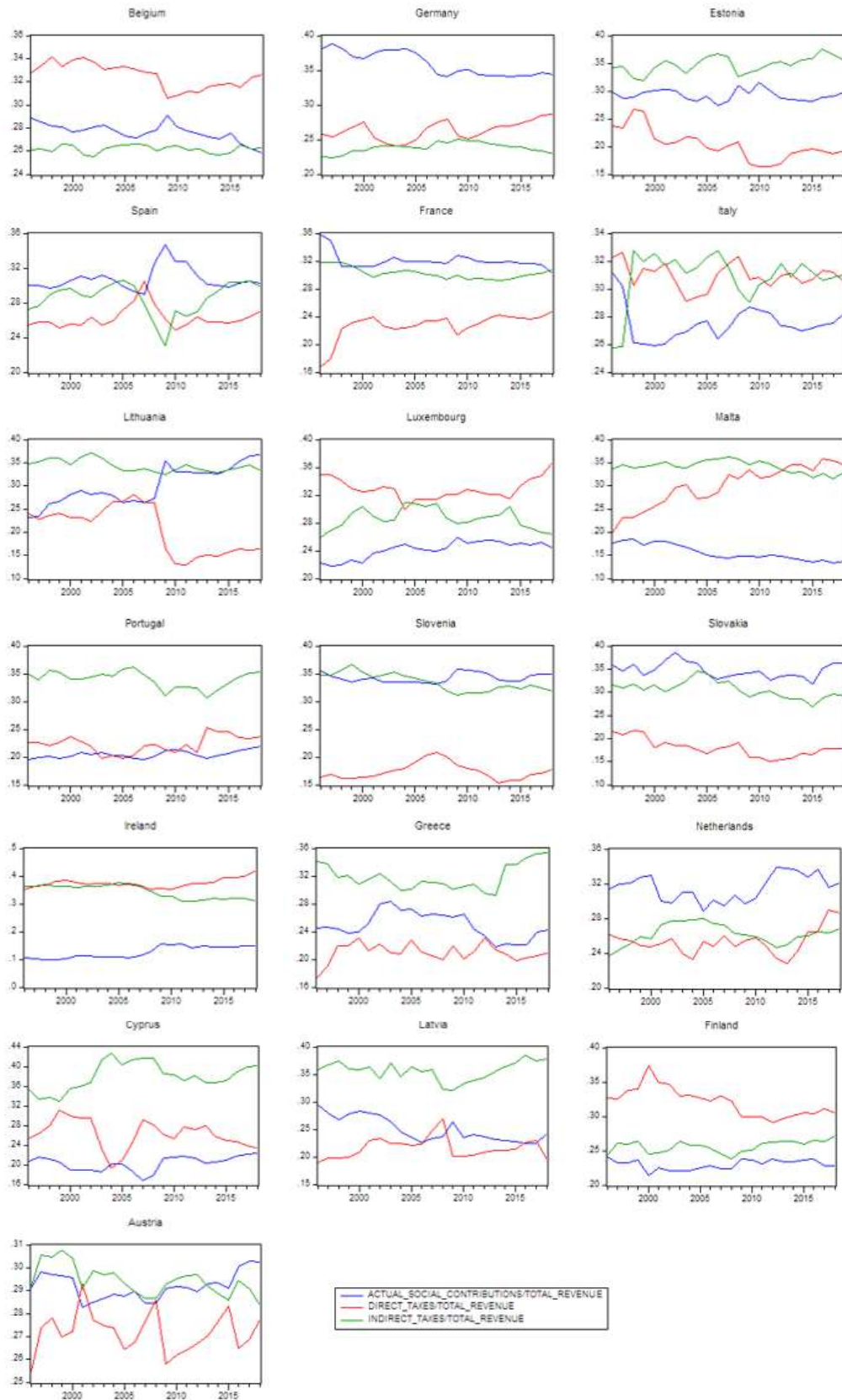
Figure 6 – Revenue categories as a fraction of Total Revenue

3.2. Methodology and econometric model

In this section, we present an econometric model, whose empirical strategy draws on the standard political budget cycles literature, where different fiscal indicators are used as alternative dependent variables.

3.2.1. Econometric model

The baseline regression consists in the following:

$$FV_{i,t} = B_0 + B_1 ELE1 + B_2 GPD \text{ to } GDP_{t-1} + B_3 FRI_{t-1} + B_4 ELE1 * FRI_{t-1} + B_5 GPD \text{ to } GDP_{t-1} * FRI_{t-1} + B_6 FV_{i,t-1} + B_7 FV_{i,t-1} * FRI_{t-1} + B_7 Real \text{ } GDP \text{ } Growth + B_8 Real \text{ } GDP \text{ } Growth * FRI_{t-1} + B_9 DepRatio, \qquad (1)$$

where $FV_{i,t}$ refers to the fiscal indicator in country *i* in year *t*, *ELE1* is an electoral dummy, *GPD to GDP* is the *Gross Public Debt-to-GDP*, *FRI* is the *Fiscal Rule Index*, $FV_{i,t-1}$ is the lagged fiscal indicator, *Real GDP Growth*, and *DepRatio* is the change in the *Dependency Ratio*.

This empirical model is based on Kneebone and McKenzie (2001), and will be estimated for several levels of disaggregation of the fiscal indicator. In the first regression (I) the dependent variable is the primary surplus (net lending, *Net_Lending*), defined as percentage of GDP at market prices and excluding debt interests - the comprehensive fiscal indicator. In the second model (II), the dependent variable is *Total Primary Expenditure*, and in the third one (III), *Total Revenue*, both defined as percentage of GDP at market prices. The other specifications respect to the disaggregation of both *Total Revenue* and *Expenditure* into alternative fiscal indicators, also defined in percentage of GDP at market prices: (IV) *Gross Fixed Capital Formation*, (V) *Intermediate Consumption* (*Interm_Consumption*), (VI) *Compensation of Employees* (*Compensation_Employees*), (VII) *Social Benefits* (*Soc_Benefits*), (VIII) *Direct Taxes*, (IX) *Indirect Taxes* and (X) *Social Contributions Received* (*Actual Social Contributions*), all scaled to GDP.

As for the independent variables, the lagged fiscal indicator is included to account for variable persistency, since fiscal policy variables are usually indexed to past values.[9] In regard to the electoral variable, it was only considered the highest level of elections (Brender and Drazen, 2005; Shi and Svensson, 2006). The dummy variable *ELE1* specifies if elections happened in a certain year (1) or not (0).

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[9] We focus on legislative and executive elections in countries with parliamentary systems and in presidential countries, respectively. This is available at https://www.idea.int/data-tools/country-view/247/40. Accessed in April 26th, 2020.

The *Gross Public Debt* (as percentage of GDP), *GPD to GDP*, was also included as a regressor, because it captures additional constraints on public spending, besides playing an important role in defining fiscal policy.

The variable *DepRatio* captures the fact that countries with a higher share of old population usually have higher levels of public spending (*e.g.*, pensions and health spending), impacting on their fiscal stance. This fiscal variable impacts on fiscal policy mostly through expenditure categories, since it has a direct effect on *Social Benefits* and *Compensation of Employees*.

Like Klomp and Haan (2013), equation (1) also contains the *Real GDP Growth* rate as a regressor as to capture the effect of the business cycle. Economic growth has an accentuated effect on fiscal policy on all levels – both revenue and expenditure levels.

The Fiscal Rule Index (*FRI*) is a comprehensive indicator as to capture the level of implementation and compliance of fiscal rules by each member state. The term of interaction between *FRI* and the *ELE1* captures the role of fiscal rules in reducing the incentives to produce political budget cycles. Additional interaction terms of *FRI* with the other regressors (*GPD-to-GDP*, lagged fiscal, and *Real GDP Growth*) are included to assess the impact of fiscal rules in the feedback of the instruments to other indicators. These interaction terms are crucial to assess the role of fiscal rules and whether it changed after the 2009 crisis.

3.2.2. Methodology

As referred in Santos (2014), although the use of panel data provides interesting analyzing possibilities for the empirical studies on political budget cycles, it can also bring some problems. According to this review, the Generalized Method of Moments (GMM) is among the most chosen estimation methods (Brender and Drazen, 2005, Shi and Svensson, 2006, Rose, 2006, Tsai, 2014), being advised for estimations with dynamic panels, with the aim to control for country-specific effects, which are biased due to the presence of lagged dependent variables (Shi and Svensson, 2006). However, in order to use the GMM we would need a large quantity of cross-sections for a short period of time, so that we can get more efficient estimators (Cameron and Trivedi, 2005). Moreover, the reduced time period would decrease the number of observations even more, due to the fact that GMM employs requires the use of more variable lags. Therefore, we have to pursue with another estimation method, since the data panel that is used for this study includes 19 members of the EMU for 27 years.

Another recurrent method that is often used among this strand of literature is the Fixed Effects Method (FEM), yet we need to choose between fixed or random effects. Hausman

(1978) developed a test that compares two different estimators, helping in the decision of choosing among the two estimation methods. According to Cameron and Trivedi (2005), the rejection of the null hypothesis means that using FEM is a better option.

According to the Hausman test, for most of the regressions we reject the null hypothesis (the exceptions are models with *Gross Fixed Capital Formation*, *Intermediate Consumption* and *Compensation of Employees* as dependent variables) – see Annex I.

However, Woolridge (2006) and Gujarati (2004) suggest that if a sample is not composed of entirely random observations, then FEM would be a preferable method. Since in this case, the cross-section units (EMU countries) are not a random sample drawn out of a vast population, but specific units that belong to the population of all the EMU members, we opted for FEM for all models.

We used *EViews* software to run the estimations of the econometric models. In order to account for the significance of cross-section, period effects and their combined significance, *EViews* runs redundant fixed effects through sums-of-squares (F-test) and the likelihood function (Chi-squared test) – see Annex II. The tests show that, for all the alternative dependent variables, both cross-section and period fixed effects are significant.

In order to correct the heteroscedasticity, we used the white diagonal correction for standard errors, due to the fact that although Ordinary Least Squares estimator is consistent, it is not optimal.

After the first attempts to estimate the model, we found that, for the majority of dependent variables, the terms of interaction with *FRI* had no statistical significance. Thus, we decided for the following procedure: i) remove all the independent variables that were not statistically significant; ii) estimate the model with the remaining variables; iii) cross *FRI* with the significant variables, so that we could have a better fit of the model.

3.3. Analysis of results

As it was said before, the empirical study is conducted at three different levels: *Net lending*; *Total Expenditure* and *Total Revenue*; and Disaggregated expenditure and revenue categories.

Table 1 shows the estimation results of equation (1) with alternative fiscal variables as dependent variables (I to X) and for the whole sample period.

Table 1 – Estimation results, alternative fiscal variables and overall sample

	I	II	III	IV	V
ELE1	-0.208491	0.104003	-0.179837	-0.056849	0.100331***
	(2.402447)	(0.187025)	(0.113438)	0.051047	(0.035651)
GPD to GDP(-1)	0.030907***	-0.026583***	0.008311*	-0.006016***	-0.004811***
	(0.008377)	(0.007661)	(0.004671)	0.002535	(0.001314)
FRI(-1)	0.775660	-1.677057	0.451581	0.345552	-0.217008**
	(1.597063)	(1.299180)	(0.545028)	0.281655	(0.108365)
ELE1*FRI(-1)					-0.063668**
					(0.032628)
GPD to GDP(-1)*FRI(-1)	-0.007319	0.008674***		-0.001997	0.001008**
	(0.004647)	(0.003527)		0.001334	(0.000470)
FV(-1)	0.578938***	0.579407***	0.769461***	0.695367***	0.796289***
	(0.084144)	(0.082302)	(0.034115)	0.054493	(0.046760)
FV(-1)* FRI(-1)	-0.003414	0.023665	-0.006066	-0.067202	0.028011
	(0.092100)	(0.029758)	(0.011645)	0.061490	(0.019793)
Real GDP Growth	0.202191***	-0.319230***	-0.148670***	0.034773***	-0.007206
	(0.041519)	(0.038525)	(0.027616)	0.012214	(0.010669)
Real GDP Growth*fri(-1)	-0.064635	-0.029288	-0.086151***	-0.022631**	
	(0.050160)	(0.037362)	(0.030572)	0.011009	
DepRatio	-0.086096*	0.044969	-0.033689	-0.018105	0.011306
	(0.052199)	(0.060263)	(0.026143)	0.018781	(0.011608)
DepRatio*FRI(-1)	0.001040				
	(0.031886)				
No. Observations	418	418	418	418	418
Adjusted R-Squared	0.692194	0.883260	0.972789	0.766374	0.948948
F-statistic	20.13777	66.73032	318.1788	29.49802	162.4825

Notes: * - significant at 10%, ** - significant at 5%, *** - significant at 1%. Standard deviation error in parenthesis. Dependent fiscal variable (FV): I – Net Lending, II – Total Primary Expenditure, III – Total Revenue, IV – Gross Fixed Capital Formation, V – Intermediate Consumption

Table 1 – Estimation results, alternative fiscal variables and overall sample (cont.)

	VI	VII	VIII	IX	X
ELE1	0.070747*	0.043417	-0.032228	-0.122216**	0.012647
	(0.039536)	(0.045297)	(0.066965)	(0.054459)	(0.035911)
GPD to GDP(-1)	-0.007628***	-0.004899*	0.001504	0.007659***	0.000494
	(0.001478)	(0.002647)	(0.002599)	(0.002350)	(0.001240)
FRI(-1)	0.182123*	-0.027516	-0.132808	0.150844	0.156261*
	0.104498	(0.284235)	(0.129703)	(0.233254)	(0.087267)
ELE1*FRI(-1)	-0.021262			0.046073	
	(0.036087)			(0.048455)	
GPD to GDP(-1)*FRI(-1)	0.000465	0.001987*		0.000130	
	(0.000576)	(0.001053)		(0.000985)	
FV(-1)	0.766636***	0.851421***	0.780281***	0.825566***	0.734877***
	(0.031353)	(0.031585)	(0.034149)	(0.037473)	(0.034562)
FV(-1)* FRI(-1)	-0.023752***	-0.004566	0.010183	-0.011612	-0.004862
	0.009536	(0.009748)	(0.010373)	(0.019339)	(0.006766)
Real GDP Growth	-0.066562***	-0.148532***	-0.013227	-0.037720***	-0.053560***
	0.009585	(0.012248)	(0.019752)	(0.012277)	(0.009679)
Real GDP Growth*FRI(-1))	-0.014084**	-0.008227		-0.039621***	-0.014458**
	0.006786	(0.010516)		(0.013361)	(0.006771)
DepRatio	0.005927	0.017560	-0.012093	-0.005094	-0.010180
	0.008321	(0.011449)	(0.015376)	(0.015331)	(0.009230)
DepRatio*FRI(-1)		-0.000303			
		(0.005805)			
No. Observations	418	418	418	418	418
Adjusted R-Squared	0.968293	0.984079	0.965766	0.912227	0.989764
F-statistic	260.8881	527.0271	256.7343	89.44696	8.588.693

Notes: * - significant at 10%, ** - significant at 5%, *** - significant at 1%. Standard deviation error in parenthesis. Dependent fiscal variable (FV): VI – Compensation of Employees, VII – Social Benefits, VIII – Direct Taxes, IX – Indirect Taxes, X – Social Contributions Received

3.3.1.1. Net lending

As already referred, common *Stability and Growth Pact* rules adopted by the EMU Member States make the existence of political cycles difficult to occur at the aggregate deficit level. From the results in regression I, Table 1, it can be seen that there is no significant electoral effect, nor do country specificities regarding fiscal rules appear to influence *Net Lending* behavior. We conclude that EMU countries, being subject to debt and deficit limits, do not experience "traditional" political cycles, but may, instead, experience cycles at disaggregated level of budget categories, while still keeping global budget balance independent from political incentives.

Regarding the remaining independent variables, we find that an increase in *Public Debt* requires larger surpluses, while the presence of stronger fiscal rules makes such correction less demanding (at 12% significance level). Indeed, in the presence of more stringent fiscal rules, countries are more disciplined and, therefore, will be in less need to correct their budget situation in the case of increase in *Public Debt*.

On the other hand, an increase of *Dependency Ratio* causes a decrease in *Net Lending*, which is also consistent, due to the fact that reducing labor force will bring less revenue (*e.g.*, income taxes and corporation taxes will be smaller) and, simultaneously, government will have to spend more with the dependent group (*e.g.*, expenditures with education, pensions and healthcare will be larger).

Finally, faster *GDP Growth* improves *Net Lending*, independently of *FRI*, consistent with the role of the automatic stabilizers.

3.3.1.2. Aggregate expenditure and revenue

At first sight, models II and III in Table 1 are better fitted than model I (adjusted *R-Squared* of 88.3% and 97.3%, respectively, against 69.2%).

Regarding aggregate expenditure (II), we do not find signs of political cycles, since *ELE1* is not statistically significant.

As expected, *Gross Public Debt* has a negative sign, meaning that the higher its value, the more constrained will be the expenditure growth. The interaction term between this variable and *FRI* has a positive sign and is significant, which means that in, the presence of fiscal rules, the higher the amount of *GPD*, the lower the cut on government spending is required to fulfill the intertemporal budget constraint.

Since economic growth is usually related with a decrease in government spending, *Real GDP Growth* has a negative sign, meaning that the higher *Real GDP Growth* is, the lower the weight of government spending on GDP, independently of *FRI*; this may reflect either an active countercyclical policy behavior or just the effects of automatic stabilizers: in periods of higher economic growth, expenditures with, *e.g.*, unemployment benefits are reduced. The presence of fiscal rules, as showed in the empirical results, does not influence this countercyclical effect, as it lacks significance.

Regarding aggregate revenue (III), the electoral variable appears to be significant at 11%, having the expected sign for the occurrence of political cycles – apparently, there seems to be some evidence on incentives to produce fiscal cycles by cutting taxes, as the sign of the coefficient of *ELE1* is negative: in election years revenue on GDP falls.

Gross Public Debt has a positive significant effect on *Total Revenue* as expected, meaning that, if there is an increase in *GPD*, the government will increase its taxes to curb debt down.

Real GDP Growth has a negative effect on *Total Revenue* as percentage of GDP, which means that an increase on *GDP Growth* increases taxes less than proportional to GDP. Unlike

previous estimations, the interaction term between this variable and *FRI* is also significant, and negative. A higher fiscal rules' compliance limits the functioning of automatic stabilizers through taxes, *i.e.*, taxes do not fall (increase) as much when output growth falls (increases).

The coefficient's sign of the lagged fiscal variable is also in line with economic theory; as in previous cases, there is a strong inertia of the fiscal variable and that is independent of *FRI*.

The analysis at this first level of disaggregation shows some evidence of political budget cycles on the revenue side. The following step is to detail our empirical results at an even more disaggregated level.

3.3.1.3. Disaggregated expenditure

Drazen and Eslava, 2010 studied a set of advanced countries like our sample regarding the electoral manipulation through voter friendly expenditures (which suggests that fiscal cycles occur in more visible budget categories) explaining the occurrence of electoral cycles in developed countries. They concluded that electoral manipulation assumes the form of changing spending on goods that are preferred by the electorate, in order to make voters think that the government shares their spending priorities.

Gootjes, Haan and Jong-A-Pin, 2019 used data on fiscal rules for 77 developed countries during the period 1984-2015, and it was found that, after the 2007-2009 financial crisis, political budget cycles occur only in countries with weak fiscal rules.

Gross Fixed Capital Formation

Regression IV (Table 1) shows that there is no evidence of electoral nor *FRI* significance. In turn, the lagged variable of *GPD* appears to have a significant negative effect on *Gross Fixed Capital Formation*, meaning that an increase in *GPD* leads to a decrease of *Public Investment* in GDP (slowdown of *Public Investment* to curb debt down). The lagged investment expenditure is also significant, which means that the higher the *Public Investment* expenditures in the previous period, the higher will be the expenditures in the next period. This inertia in the adjustment of public expenditure may occur due to costs of capital installation.

An increase of in output growth leads to an increase of the weight of *Public Investment* in GDP, however this effect is moderated in the presence of higher compliance to fiscal rules.

The absence of an electoral effect in this fiscal variable is expected, since our sample consists of only developed countries and, therefore, voters do not care for investment in certain infrastructures as much as they do in developing countries.

Intermediate Consumption

Although we do not find evidence of political budget cycles on *Total primary expenditure*, estimates in V show a positive significant effect of the electoral variable on *Intermediate Consumption*, which means that political cycles influence this kind of expenditure. Despite the fact that spending is higher in election years, the presence of more stringent fiscal rules reduces political incentives.

The higher *GPD to GDP*, the lower will be this expenditure, yet the interaction term with *FRI* reduces the need to budget correction through this type of spending.

FRI has also a direct significant effect on *Intermediate Consumption* – the higher the value of *FRI*, the lower will be this expenditure (higher discipline effect).

The lagged (as all of the others mentioned above) Intermediated Consumption, besides being significant, is persistent and highly determined by its value in the year before, and independent of *FRI*.

Compensation of Employees

Looking at regression VI (Table 1), we can see a clear electoral effect on the expenditure side – *Compensation of Employees* is estimated as being 7.1% of GDP higher in election years, which proves that governments prefer to increase some expenditure categories that are more visible to the electorate and, at the same time, is signaling his competence, as in Rogoff and Sibert (1988) and Rogoff (1990). Unlike in *Intermediate Consumption*, *FRI* is not effective in containing this effect, since the interaction term with *FRI* is not significant.

As expected, *GPD* has a negative significant effect to control for debt, which is independent of *FRI*.

As before there is a strong persistency in the dynamics of this variable, indexed to previous year value by 76%. However, we find evidence that this indexation effect is decreased under higher *FRI*.

Regarding *FRI*, we find a rather unexpected effect – the higher *FRI* is, the higher will be the government spending on wages. We can explain this effect bay saying that more discipline countries can afford to have a larger weight of the public sector, as measured by one of its most structural and difficult to change budget expenditures.

The higher *GDP Growth* is, the lower is the weight of this expenditure on GDP, meaning that wages do not grow as much as GDP does. This countercyclical effect is very important,

because if GDP falls, wages do not fall as much. Furthermore, *FRI* reinforces this countercyclical effect – in the presence of fiscal rules, a GDP break will not affect as much the *Compensation of Employees*. In contrast to revenues, *FRI*, instead of limiting, reinforces the stabilization mechanism on the expenditure side (*cfr.* 3.3.1.2, above).

Social Benefits

In regression VII (Table 1) there is no evidence of electoral cycles, since the electoral variable has no significant effect on *Social Benefits*.

As in some other variables, *GPD* has a marginal significant negative effect of 0.48 percentage points on *Social Benefits-to-GDP* and *FRI* further accentuates this effect.

The lagged fiscal indicator has a significant effect, which means that *Social Benefits* are persistent in time, having an indexation estimated coefficient of 0.85 to the value in the year before. Yet, the interaction term between this one and *FRI* does not display a significant effect.

As expected, *GDP Growth* has a negative effect on *Social Benefits* (independently of *FRI*). This can be explained by the fact that this kind of fiscal indicator works mostly as an automatic stabilizer, moving largely in a countercyclical way.

An unexpected result is that the change in the *Dependency Ratio* does not have a significant effect on *Social Benefits*.

3.3.1.4. Disaggregated revenue

The overall revenue category will now be analyzed considering its split into three subcategories: *Direct* and *Indirect Taxes* and *Social Contributions Received* (regressions VIII, IX and X, respectively).

Direct taxes

Regarding this category, we found no significant effect on *Direct Taxes*, except for the lagged category.

Indirect Taxes

It appears that there is an electoral effect, which indicates that, in election years, the government opts to decrease *Indirect Taxes*, independently of *FRI* (see outcome IX). Apparently, this is the category that justifies the evidence on political cycles on the revenue side.

GPD has a significant positive effect on this revenue category, indicating that the higher the *Public Debt*, the higher the taxes will be, which is consistent because an increase of the amount of *Public Debt* requires a higher effort on public revenue in order for governments to be able to fulfill the intertemporal restriction. Yet, in this situation *FRI* does not play a significant role to reinforce this effect.

We can also see persistency of *Indirect Taxes*, being indexed to the value in the year before by 82% and, once again, the interaction term with *FRI* does not seem to be significant.

An increase in *GDP Growth* leads to a decrease in the weight of these taxes in GDP; moreover, *FRI* reinforces this effect.

Actual Social Contributions

There is no evidence of electoral effect in this fiscal variable, neither there is any effect with the presence of fiscal rules.

Regarding *FRI*, we found a statistically significant impact of fiscal rules in increasing *Social Contributions to GDP*.

In what concerns *Real GDP Growth*, output growth leads to a decrease in the weight of *Social Contributions-to-GDP* and *FRI* accentuates this negative effect.

3.3.2. Before and after the 2009 crisis

We now split the sample in two in order to compare periods before and after the economic and financial crisis of 2009, which had an impact on European economies, imposing constrains on fiscal policy conduction. Thus, we will try to understand the impact of the global crisis on the incentives for political cycles and the effectiveness of rules on dampening them.

Table 2 – Estimation results, before *vs.* after the 2009 Crisis

	I		II		III		IV		V	
	1997 - 2008	2009 - 2018	1997 - 2008	2009 - 2018	1997 - 2008	2009 - 2018	1997 - 2008	2009 - 2018	1997 - 2008	2009 - 2018
ELE1	-0.589262***	0.255045	0.456823***	-0.298443	-0.219041	-0.085929	-0.085914	-0.082282	0.108829**	0.096528*
	(0.204611)	(0.296187)	(0.185752)	(0.335124)	(0.152152)	(0.128695)	(0.069245)	(0.070690)	(0.048710)	(0.052845)
GPD to GDP(-1)	0.013005	0.061831***	-0.020771	-0.043112	0.009523	0.026270***	-0.006883	-0.012449***	-0.000437	-0.003645*
	(0.016079)	(0.023829)	(0.016146)	(0.027402)	(0.011459)	(0.006368)	(0.004624)	(0.004712)	(0.003559)	(0.002136)
FRI(-1)	-5.544927	1.148292	-3.773689	-1.224975	-1.561069	2.250290***	-0.173321	0.175730	-0.223951	-0.251921*
	(6.364556)	(2.117324)	(3.530255)	(1.684430)	(2.552920)	(0.589981)	(0.608818)	(0.329860)	(0.228980)	(0.133348)
ELE1*FRI(-1)									0.064464	-0.071338*
									(0.082291)	(0.038165)
GPD to GDP(-1)*FRI(-1)	-0.022794	-0.003054	0.025670**	-0.003324			0.004095	-0.001809	-0.001192	0.001074**
	(0.016201)	(0.006319)	(0.012707)	(0.004906)			(0.004013)	(0.001570)	(0.002489)	(0.000526)
FV(-1)	0.416721***	0.363891***	0.543375***	0.492152***	0.743904***	0.692634***	0.697704***	0.415721***	0.719738***	0.553965***
	(0.088454)	(0.108095)	(0.069950)	(0.129536)	(0.063875)	(0.065611)	(0.092844)	(0.082251)	(0.071738)	(0.078219)
FV(-1)* FRI(-1)	0.016678	-0.038214	0.034383	0.050526	0.027801	-0.047621***	-0.034154	-0.007708	0.080473	0.025305
	(0.083741)	(0.102029)	(0.072703)	(0.044973)	(0.057306)	(0.012735)	(0.116953)	(0.069542)	(0.069122)	(0.018765)
Real GDP Growth	0.335577***	0.149465***	-0.351894***	-0.277075***	-0.040701	-0.259083***	0.018640	0.066434***	-0.017397	-0.014969
	(0.056943)	(0.059223)	(0.055836)	(0.062500)	(0.034892)	(0.025964)	(0.018483)	(0.017354)	(0.018822)	(0.011445)
Real GDP Growth*FRI(-1)	0.015328	0.005855	-0.051719	-0.093033	0.004476	-0.076040***	-0.030495	-0.036275***	0.041481**	
	(0.071212)	(0.077770)	(0.073303)	(0.072101)	(0.040607)	(0.025999)	(0.021360)	(0.014775)	(0.021092)	
DepRatio	-0.064000	0.109281	0.051067	-0.179608	-0.063043	-0.014682	-0.018652	-0.014398		-0.008062
	(0.108096)	(0.137748)	(0.070360)	(0.155499)	(0.054114)	(0.050342)	(0.033711)	(0.033917)		(0.013797)
DepRatio*FRI(-1)	0.161010	-0.019669								
	(0.150395)	(0.043122)								
No. of observations	228	190	228	190	228	190	228	190	228	190
Adjusted R-Squared	0.790410	0.672554	0.914302	0.849532	0.970155	0.983961	0.787616	0.768558	0.928341	0.978482
F-statistic	22.95042	11.49176	64.73222	30.63885	200.4293	332.2816	23.15311	18.43385	78.38851	239.7280

Notes: * - significant at 10%, ** - significant at 5%, *** - significant at 1%. Standard deviation error in parenthesis. Dependent fiscal variable (FV): I – Net Lending, II – Total Primary Expenditure, III – Total Revenue, IV – Gross Fixed Capital Formation, V – Intermediate Consumption

Table 2 – Estimation results, before *vs.* after the 2009 crisis (Cont.)

	VI		VII		VIII		IX		X	
	1997 - 2008	2009 - 2018	1997 - 2008	2009 - 2018	1997 - 2008	2009 - 2018	1997 - 2008	2009 - 2018	1997 - 2008	2009 - 2018
ELE1	0.086522**	-0.011651	0.052223	0.043018	-0.183247**	0.133364	-0.106716	-0.182648***	0.056887	-0.018425
	(0.044503)	(0.076073)	(0.066174)	(0.057637)	(0.089677)	(0.081570)	(0.082156)	(0.070796)	(0.046852)	(0.051728)
GPD to GDP(-1)	-0.007487***	-0.007196***	-0.005922	0.002356	0.006574	0.002535	0.008601*	0.016656***	0.001436	0.002976
	(0.002875)	(0.003044)	(0.005453)	(0.005427)	(0.005659)	(0.003721)	(0.005232)	(0.003817)	(0.003143)	(0.002461)
FRI(-1)	-0.607058	0.449411***	1.261175	-0.284530	0.314482	0.188193	0.520901	0.378737	0.275319	0.219592**
	(0.509818)	(0.145157)	(1.643324)	(0.511929)	(0.593671)	(0.123865)	(0.870855)	(0.336556)	(0.515830)	(0.099521)
ELE1*FRI(-1)	-0.084491	0.033587					-0.019141	0.121635**		
	(0.067869)	(0.055682)					(0.116958)	(0.052181)		
GPD to GDP(-1)*FRI(-1)	0.003431	-0.000957	0.002339	-1.56E-05			0.001801	-4.67E-05		
	(0.002300)	(0.000804)	(0.003002)	(0.001671)			(0.005411)	(0.001263)		
FV(-1)	0.631925***	0.761004***	0.834908***	0.704489***	0.642278***	0.473407***	0.700548***	0.685021***	0.654793***	0.690790***
	(0.054436)	(0.053305)	(0.052268)	(0.063010)	(0.059670)	(0.075071)	(0.067090)	(0.060181)	(0.067947)	(0.079656)
FV(-1)* FRI(-1)	0.029895	-0.015855***	-0.036283	-0.005947	-0.028388	-0.014628	-0.078882	-0.020195	-0.021114	-0.011548
	(0.047434)	(0.014336)	(0.032280)	(0.013895)	(0.048048)	(0.009739)	(0.069827)	(0.030999)	(0.041518)	(0.008865)
Real GDP Growth	-0.105783***	-0.043777***	-0.136105***	-0.170911***	-0.017109	-0.060389***	0.020775	-0.062648***	-0.046713***	-0.062507***
	(0.011741)	(0.014076)	(0.015783)	(0.022340)	(0.021523)	(0.014432)	(0.017040)	(0.013307)	(0.012665)	(0.015155)
Real GDP Growth*FRI(-1)	-0.008174	-0.025761***	-0.004174	0.002684			0.026084	-0.038496***	0.003899	-0.015824*
	(0.013363)	(0.009264)	(0.015062)	(0.015630)			(0.018520)	(0.011294)	(0.014229)	(0.009307)
DepRatio	-0.017139	0.011526	-0.009076	-0.013595	-0.029394	-0.024436	-0.038195	0.020454	0.014563	0.002537
	(0.014986)	(0.018805)	(0.026168)	(0.032379)	(0.031331)	(0.033815)	(0.029900)	(0.026399)	(0.022505)	(0.019214)
DepRatio*FRI(-1)			0.007207							
			(0.011077)							
No. of observations	228	190	228	190	228	190	228	190	228	190
Adjusted R-Squared	0.971523	0.973653	0.982379	0.985745	0.962858	0.980643	0.889178	0.957385	0.990185	0.989883
F-statistic	199.5712	189.7723	329.2819	354.2302	164.4610	282.6095	47.70092	115.7577	619.9581	529.3357

Notes: * - significant at 10%, ** - significant at 5%, *** - significant at 1%. Standard deviation error in parenthesis. Dependent fiscal variable (FV): VI – Compensation of Employees, VII – Social Benefits, VIII – Direct Taxes, IX – Indirect Taxes, X – Social Contributions Received

3.3.2.1. Net Lending

Before the financial crisis, the electoral variable has a significant (at 1%) negative impact on *Net Lending*. This means that, on election years, governments were, on average, incurring in primary deficits. In other words, there is evidence of deficit cycles until 2008. As stated before, Schneider (2010) referred that political budget cycles are often related with deficit spending in the pre-election period, and adding this to the fact that fiscal rules were not

playing a high important role, it would be easier for governments to conduct deficit cycles, since the economy was not as limited by fiscal rules. After the crisis, the electoral effect disappears, and a significant positive feedback on debt arises while persistency is reduced; but no relation appears to arise from additional *FRI* discipline. Apparently, independently of *FRI*, the crisis increased the feedback on debt and reduced the incentives to generate deficit cycles.

The positive effect of *GDP Growth* on *Net Lending* is more accentuated before the crisis than after crisis, which reflects a less pro-cyclical behavior after the crisis.

3.3.2.2. Aggregate expenditure and revenue

In regards to aggregate primary expenditure, we find evidence of political cycle in aggregate expenditure before the crisis – the electoral variable as a significant positive effect, meaning that *Total Expenditure* increased in election years; yet, *FRI* did play any significant role in this regard but countries with higher *FRI* could reduce expenditures by less to react to debt increases. Since 2008, and also irrespectively of *FRI*, the electoral effect ceased to be relevant.

As in the case of *Net lending*, comparing the coefficient on the lagged dependent variable in both periods, it seems that there is less inertia of government spending after the crisis.

Before crisis, an increase on *Real GDP Growth* led to a decrease of the weight of public spending in GDP, yet the magnitude of this effect decreased since 2008. Thus, after the crisis, the countercyclical behavior of expenditure is reduced.

On the other hand, in regard to aggregate revenue, we do not find any electoral effect after 2008; however, it should be noted that before crisis, this effect was negative and significant at 15%.

After 2008, the *GPD* effect became significant – an increase of *Public Debt* leads to an increase of government's revenue, independently of *FRI*.

Also, *FRI* effects on revenue became positive after 2008, meaning that stricter fiscal rules lead to higher revenues.

Looking at the lagged dependent variable, it should be noted its inertia falls, comparing both periods. However, the interaction term between this one and *FRI* becomes significant and shows that the higher *FRI* is, the lower the indexation of revenues.

After the crisis, *Real GDP growth* has a negative impact on government's revenue, and this effect is accentuated by *FRI*. These means that after the crisis, revenues became less pro-cyclical, further reduced by *FRI*. *FRI* thus increases the countercyclical behavior of revenues.

3.3.2.3. Disaggregated expenditure
Gross Fixed Capital Formation

This expenditure subcategory does not display any significant electoral impact, nor do fiscal rules seem to be significant either before or after the crisis.

After the crisis, feedback of these expenditures on *Gross Public Debt-to-GDP* becomes negative and significant, independently of *FRI* (a one percentage point increase in debt, reduces *Public Investment* on 1.2% of GDP).

Concerning *Real GDP Growth*, we found the same result of the previous estimation. An increase in growth leads to an increase of the weight of *Public Investment* on GDP, yet this effect is moderate in the presence of higher compliance with fiscal rules.

Intermediate Consumption

Before crisis, we find a positive significant effect of the electoral variable on *Intermediate Consumption*, which means that, in election years, this kind of expenditure increases, independently of *FRI*. Although electoral effect still persists after the crisis (with lower significance), this effect reduces with *FRI*; that is, fiscal rules became more effective in limiting the political effect after crisis.

Denoting a stronger reaction to *GPD*, after 2008, *Intermediate Consumption* reacts negatively to *Public Debt*, however this impact is limited by the role of fiscal rules, showing that countries with more rigid rules need not to sacrifice expenditures as much to correct for debt.

FRI, alone, also contributes to a lower *Intermediate Consumption* after the crisis. This reinforces the effectiveness of fiscal rules.

Before 2008, *Dependency Ratio* exhibits a significant positive impact on this expenditure, however, afterwards, this variable loses significance.

Compensation of Employees

Also, in the case of wages, there is strong evidence of political cycles - in election years, government used to increase such expenditure. However, such incentive disappeared after the crisis, irrespectively of *FRI*.

Regarding *FRI*, the result after 2008 is the one dominating for the entire period – the higher *FRI*, the higher the *Compensation of Employees* – countries with more efficient rules might better support a larger public sector with higher structural expenditure.

The negative effect of *GPD* remains significant in both periods and *Compensation of Employees* displays persistency in both periods, through reduced with *FRI*, after 2008.

An increase of the economic growth leads to a decrease of spending over GDP in both periods, being that, after crisis, *FRI* further amplifies this impact.

Social Benefits

In VII, Table 2, we do not find evidence of fiscal cycles regarding this expenditure. Similarly, to previous categories, *Social Benefits* exhibit persistency in both periods, having an estimated indexation coefficient of 0.83 (before 2008) and 0.76 (after 2008), independently of *FRI*.

Economic growth displays a highly significant negative impact on *Social Benefits* in both periods, independently of *FRI*, which is consistent, since this kind of expenditure works mostly as an automatic stabilizer, moving largely countercyclically.

3.3.2.4. Disaggregated Revenue

Direct taxes

Before the crisis, we can see a significant electoral effect: during election years, *Direct Taxes* are 1.8% of GDP lower than in non-election years. After 2008, this effect becomes non-significant. Moreover, *FRI* does not seem to impact on this electoral effect, neither does it have an impact on this category alone.

Direct taxes also display high persistency in both periods, but the coefficient of the interaction term between its lagged value and *FRI* is not significant – this may happen because of lack of *Revenue Rules* in this sample of countries or that these are not as binding (see next section).

There is evidence of a significant negative effect of *Real GDP Growth* in the independent variable after 2008, which could be explained by reverse causality but also by a more countercyclical reaction of taxes to output.

Indirect Taxes

The electoral effect on *Direct Taxes* before the crises seems to have shifted towards *Indirect Taxes* after the crisis. After the financial crisis, the government tends to reduce *Indirect Taxes* in election years. Yet, *FRI* counteracts this effect, being effective in reducing such incentives.

GPD also displays a significant positive effect on *Indirect Taxes*, independently of *FRI*, this effect becomes more significant after the crisis.

Real GDP Growth becomes significant after 2008, having a negative impact on this revenue category and this is reinforced by *FRI*.

Actual Social Contributions

In this revenue category there is no evidence of electoral cycles in both periods, however, after crisis, there seems to be a statistically significant marginal impact of fiscal rules in increasing *Social Contributions* in GDP by 21.95 percentage points.

Regarding *Real GDP Growth*, this variable remains significant and with the same effect, having a negative impact on *Social Contributions*, yet *FRI* might enhance this effect after crisis.

3.3.3. The effect of specific fiscal rules on the political budget cycles in the EMU

In this section, we expand the previous work, by considering, instead of the comprehensive index *FRI*, four alternative types of fiscal rules – *Budget Balance Rules* (BBR), *Debt Rules* (DR), *Expenditure Rules* (ER) and *Revenue Rules* (RR). We define a dummy variable that indicates the presence (*dummy* = 1) or the absence (*dummy* = 0) of each type of rule.

We are going to analyze the impacts on the budget categories where the more relevant effects are expected – for example, we will estimate *BBR* for the first and second level of disaggregation, *DR* and *RR* for the third level on the expenditure and revenue sides, respectively.

The construction of this fiscal rules dummies was based on European Commission fiscal rules database.[10]

3.3.3.1. The role of alternative fiscal rules – a sample-split approach

In a first analysis we attempt to compare the results on the fiscal variable dynamics considering two separate samples: a sample that collects panel observations where and when a certain type of fiscal rule is present and, another sample, that collect panel observations where and when a certain type of fiscal rule is absent.

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[10] Database available at: https://ec.europa.eu/info/publications/fiscal-rules-database_en Accessed in May 14th, 2020.

We adopted the same baseline regression of previous estimations, yet the interaction terms between *FRI* and the other variables were excluded from this regression – otherwise the results would lead to overlapping effects, since *FRI* is a composite index of different types of fiscal rules together with their strength and coverage.

The regression is defined as:

$$FV_{i,t} = B_0 + B_1 ELE1 + B_2 GPD\ to\ GDP_{t-1} + B_3 FV_{t-1} + B_4 Real\ GDP\ Growth + B_5 DepRatio \qquad (2)$$

We compare the coefficients on independent variables between regressions estimated for each fiscal variable, with and without each type of fiscal rule. For the estimation of the impact of Balanced Budget Rules and *Debt Rules* (Tables 3a and 3b, respectively), we took *Net Lending* (I), *Total Primary Expenditure* (II) and *Total Revenue* (regression III), as fiscal indicators. For assessing the role of *Expenditure Rules* (Table 3c) we considered *Total Primary Expenditure* (regression II), *Gross Fixed Capital Formation* (regression IV), *Intermediate Consumption* (regression V), *Employee Compensation* (regression VI) and *Social Benefits* (regression VII). Regarding *Revenue Rules* we considered *Total Revenue* (regression I), *Direct Taxes* (regression II), *Indirect Taxes* (regression III) and *Social Contributions Received* (regression IV). The methodology was the same as used before (FEM).

Table 3a - Balanced Budget Rules

	I		II		III	
	BBR=1	BBR=0	BBR=1	BBR=0	BBR=1	BBR=0
ELE1	-0.084416	-0.511769	-0.164048	0.683352**	-0.267356**	0.037764
	(0.214812)	(0.437617)	(0.219145)	(0.010764)	(0.129737)	(0.248105)
GPD to GDP(-1)	0.028002**	0.011979	-0.040103***	0.010764	0.007617	0.024632*
	(0.012167)	(0.026591)	(0.012417)	(0.025519)	(0.006989)	(0.014093)
FV(-1)	0.530623***	0.422842***	0.600006***	0.283785***	0.743823***	0.680308***
	(0.124643)	(0.100163)	(0.102040)	(0.117147)	(0.044607)	(0.087200)
Real GDP Growth	0.172714***	0.285141***	-0.316812***	-0.269360***	-0.197823***	-0.084230***
	(0.062501)	(0.065042)	(0.053445)	(0.058864)	(0.048393)	(0.034857)
DepRatio	-0.076408	-0.285141**	0.019774	0.404482***	-0.029077)	-0.042587
	(0.062367)	(0.138103)	(0.072966)	(0.132274)	(0.035655)	(0.087944)
No. Observations	297	110	297	110	297	110
Cross-Sections included	19	11	19	11	19	11
Adjusted R-Squared	0.683557	0.761190	0.879719	0.902872	0.974506	0.948165
F-statistic	15.53175	11.85717	50.20232	32.66329	258.1484	63.30655
Fixed Effects	Period + Cross Section	Period + Cross Section	Period + Cross Section	Period + Cross Section	Period + Cross Section	Period + Cross Section

Notes: * - significant at 10%, ** - significant at 5%, *** - significant at 1%. Standard deviation error in parenthesis. Dependent fiscal variable (FV): I – Net Lending, II – Total Primary Expenditure, III – Total Revenue

According to the results in Table 3a, looking at regression I there seems to be no significant electoral effect in *Net Lending*, which is consistent to the fact that political cycles are not conducted at the overall deficit level for this sample of countries. The absence of *Balance Budget Rules* leads to electoral behavior on the primary expenditure side (coefficient of *ELE1* is positive and significant in II, *BBR*=0), while their presence does not eliminate political cycles on the revenue side (coefficient of *ELE1* is negative and significant in III, *BBR*=1).

Feedback reaction of *Net Lending* and *Total Primary Expenditure* to *Public Debt* is significant when *BBR* apply, but feedback reaction of *Total Revenue* only occurs if *BBR* are absent.

Unexpectedly, the presence of *BBR* increase the persistency of fiscal variables (coefficients of *FV*(-1) are larger under *BBR*=1) and *Total Expenditure*s and revenues become less and more pro-cyclical, respectively, under *BBR*.

Finally, *Dependency Ratio* becomes significant only when *BBR* are not present, showing a negative impact on *Net lending* and a positive impact on primary expenditure. Irrespectively of *BBR* adoption, *Dependency Ratio* evolution does not affect revenue over GDP.

Table 3b - Debt Rules

	I		II		III	
	DR=1	DR=0	DR=1	DR=0	DR=1	DR=0
ELE1	-0.393855	-0.047422	-0.064396	0.069320	-0.461814**	-0.022918
	(0.339495)	(0.258839)	(0.321540)	(0.270066)	(0.226850)	(0.132295)
GPD to GDP(-1)	0.019374	0.022457*	-0.025121	-0.012111	0.010609	0.018368**
	(0.019966)	(0.013461)	(0.022119)	(0.018539)	(0.013772)	(0.008307)
FV(-1)	0.294258***	0.598490***	0.246402**	0.600928***	0.569476***	0.774259***
	(0.112141)	(0.170420)	(0.117404)	(0.143665)	(0.078664)	(0.049061)
Real GDP Growth	0.019523	0.240250***	-0.221387***	-0.276403***	-0.252867***	-0.090926***
	(0.080130)	(0.051323)	(0.065772)	(0.049888)	(0.068805)	(0.024187)
DepRatio	-0.696408***	-0.029891	0.481553**	0.042841	-0.245242**	-0.004950
	(0.196359)	(0.051013)	(0.210017)	(0.059940)	(0.106527)	(0.037027)
No. Observations	137	266	137	266	137	266
Cross-Sections included	15	18	15	18	15	18
Adjusted R-Squared	0.708639	0.705864	0.895017	0.890250	0.970595	0.977581
F-statistic	9.269359	15.78942	29.98631	50.99021	113.2284	269.7302
Fixed Effects	Period + Cross Section	Period + Cross Section	Period + Cross Section	Period + Cross Section	Period + Cross Section	Period + Cross Section

Notes: * - significant at 10%, ** - significant at 5%, *** - significant at 1%. Standard deviation error in parenthesis. Dependent fiscal variable (FV): I – Net Lending, II – Total Primary Expenditure, III – Total Revenue

Regarding the results in table 3b, we do not see significant electoral effect in *Net Lending*, nor in *Total Primary Expenditure* (regression I and II, respectively). However, the presence of *Debt Rules* leads to electoral behavior on the revenue side (coefficient of *ELE1* is negative and significant in III, *DR*=1).

Feedback reaction of *Net Lending* and *Revenue* to *Public Debt* is significant when *DR* are absent, but feedback reaction of *Total Primary Expenditure* is null doesn't matter the presence or absence of this type of rules.

The absence of *DR* increase the persistency of fiscal variables (coefficients of *FV*(-1) are larger under *DR*=0).

Moreover, when these rules exist, *Dependency Ratio* variation has a significant negative impact on *Net Lending* and on *Total Revenue*, while in *Total Primary Expenditure* it has a positive effect.

Table 3c - Expenditure Rules

	II ER=1	II ER=0	IV ER=1	IV ER=0	V ER=1	V ER=0	VI ER=1	VI ER=0	VII ER=1	VII ER=0
ELE1	-0.327288	0.467052*	0.022277	-0.137570	0.021756	0.173569**	0.075230**	0.156378**	0.058481	0.037060
	(0.371198)	(0.275877)	(0.073777)	(0.099385)	(0.037328)	(0.078143)	(0.035474)	(0.072212)	(0.064385)	(0.095820)
GPD to GDP(-1)	-0.036812	-0.015021	-0.013992**	-0.020230***	-0.004471**	0.001404	-0.003087	-0.006963	-0.005535	0.000467
	(0.035980)	(0.022006)	(0.006829)	(0.007778)	(0.002045)	(0.005954)	(0.004630)	(0.004013)	(0.004013)	(0.007182)
FV(-1)	0.473900***	0.432095***	0.517403***	0.671847***	0.823285***	0.665139***	0.683576***	0.589610***	0.792691***	0.854736***
	(0.145841)	(0.089624)	(0.178376)	(0.101732)	(0.059838)	0.100312	(0.056289)	(0.077717)	(0.052277)	(0.067422)
Real GDP Growth	-0.360120***	-0.274162***	-0.001388	0.053628**	-0.024877*	-0.013074	-0.100715***	-0.096757***	-0.184811***	-0.119527***
	(0.069035)	(0.066809)	(0.021635)	(0.024404)	(0.014237)	(0.024812)	(0.012643)	(0.018520)	(0.024679)	(0.021049)
DepRatio	-0.025418	0.102233	0.008149	-0.026062	0.019321	0.053242*	-0.061833***	-0.018191	0.019110	0.065824*
	(0.133909)	(0.120457)	(0.047741)	(0.051829)	(0.016599)	(0.032543)	(0.018491)	(0.026139)	(0.036137)	(0.035460)
No. Observations	164	148	164	148	164	148	164	148	164	148
Cross-Sections included	13	16	13	16	13	16	13	16	13	16
Adjusted R-Squared	0.866822	0.888963	0.836012	0.702626	0.983624	0.893432	0.986324	0.950693	0.987975	0.978522
F-statistic	28.91919	38.96384	22.86780	12.20411	258.6529	40.75507	310.3582	92.42969	353.4214	217.0345
Fixed Effects	Period + Cross Section	Period + Cross Section	Period + Cross Section	Period + Cross Section	Period + Cross Section	Period + Cross Section	Period + Cross Section	Period + Cross Section	Period + Cross Section	Period + Cross Section

Notes: * - significant at 10%, ** - significant at 5%, *** - significant at 1%. Standard deviation error in parenthesis. Dependent fiscal variable (FV): II – Total Primary Expenditure, IV – Gross Fixed Capital Formation, V – Intermediate Consumptions, VI – Compensation of Employees, VII – Social Benefits

Overall, from Table 3c we can see that there is a significant electoral effect when *Expenditure Rules* are not present (*ER*=0), with the exception of *Gross Fixed Capital Formation* and *Social Benefits*. The highest effects are in *Intermediate Consumption* (significant at 2%) and in *Compensation of Employees* (significant at 3%). In the latter case, incentives arise with or without *Expenditure Rules*, but are higher when ER are absent. We can conclude that in these two expenditure categories, ones of the most visible expenditure categories to voters, the presence of ER delivers some level of discipline effectiveness.

The impact of *GPD* on the expenditure dynamics is rather neutral, with the exception of the impacts on *Intermediate Consumption*. Debt limits this expenditure only when *Expenditure Rules* are present.

Real GDP Growth appears to be highly significant to almost expenditure categories, also independently the presence of this type of rules. Apparently, expenditures are slightly more counter-cyclical when ER are present.

As can be observed, *Dependency Ratio* variation seems to have a significant effect on *Intermediate Consumption* and *Social Benefits*, when *ER* are not present, and the presence of *ER* reduces *Compensation of Employee* reaction to *Dependency Ratio* changes. Thus, reaction of expenditures to pressures from increasing older population are more limited under *ER*.

Table 3d - Revenue Rules

	III		VIII		IX		X	
	RR=1	RR=0	RR=1	RR=0	RR=1	RR=0	RR=1	RR=0
ELE1	0.033934	-0.163584	0.113668	-0.034218	-0.022804	-0.110982*	-0.087996	0.010367
	(0.225081)	(0.13303)	(0.132874)	(0.074655)	(0.120252)	(0.062550)	(0.108078)	(0.035595)
GPD(1)	-0.002154	0.007764	0.010745	0.001348	-0.015042	0.007136***	-0.016616	0.001306
	(0.032424)	(0.005103)	(0.035955)	(0.002677)	(0.012216)	(0.002518)	(0.026683)	(0.001255)
FV(-1)	0.571606***	0.781192***	0.688897***	0.747426***	0.759680***	0.844544***	0.401708***	0.743577***
	(0.138545)	(0.037204)	(0.097535)	(0.038971)	(0.121287)	(0.040021)	(0.138109)	(0.037795)
Real GDP	-0.169325***	-0.171309***	0.079169	-0.027939*	-0.023939	-0.045862***	-0.160709***	-0.046606***
	(0.054600)	(0.040614)	(0.069769)	(0.016773)	(0.023029)	(0.017975)	(0.051497)	(0.006884)
Dependency Ratio	-0.085952	-0.052633*	-0.195098**	-0.023871	0.026222	-0.012231	-0.100562	-0.008841
	(0.147855)	(0.029236)	(0.090253)	(0.016435)	(0.067649)	(0.017926)	(0.089901)	(0.010449)
No. Observations	66	348	66	348	66	348	66	348
Cross-Sections included	5	18	5	18	5	18	5	18
Adjusted R-Squared	0.990026	0.962533	0.982067	0.962628	0.970938	0.895846	0.947955	0.992348
F-statistic	216.0747	208.3140	119.6528	208.8611	73.38701	70.40954	40.46418	1047.463
Fixed Effects	Period + Cross Section	Period + Cross Section	Period + Cross Section	Period + Cross Section	Period + Cross Section	Period + Cross Section	Period + Cross Section	Period + Cross Section

Notes: * - significant at 10%, ** - significant at 5%, *** - significant at 1%. Standard deviation error in parenthesis. Dependent fiscal variable (FV): III – Total Revenue, VIII – Direct Taxes, IX – Indirect Taxes, X – Social Contributions Received

In general, the results in Table 3d show no evidence of electoral manipulation, independently of the existence of *Revenue Rules*, with the exception of *Indirect Taxes* that crucially react to election moments if no *RR* apply (result significant at a 7% level). Feedback reaction on debt is only significant for *Indirect Taxes* when *RR* are not present.

Real GDP Growth displays a significant negative impact in all revenue categories, except for *Direct* and *Indirect Taxes* that show no feedback on output growth when *Revenue Rules* are not present.

Variation of the *Dependency Ratio* has only a significant effect on *Total Revenue* and *Direct Taxes*, when *Revenue Rules* are absent or present, respectively.

3.3.3.2. The role of alternative fiscal rules – a dummy variable approach

In this section we follow a different approach to analyze the relationship between the existence of several types of fiscal rules and the presence of political budget composition cycles. Regarding the regressions we used in these estimations, we followed the same reasoning as previously, excluding *FRI* and its interaction terms and now including interaction terms between the electoral variable and each type of fiscal rule (*dummy* variable).

Thus, first we estimated for each fiscal indicator the following regression,

$$FV_{i,t} = B_0 + B_1 ELE1 + B_2 GPD_{t-1} + B_3 FV_{t-1} + B_4 RealGDPGrowth + B_5 \Delta DepRatio + B_6 ELE1 *$$

$$DR + B_7 ELE1 * ER + B_8 ELE1 * BBR + B_9 ELE1 * RR \qquad (3)$$

And then augmented with the interaction terms between each fiscal rule type and the remaining independent variables as well; this yields better adjustment results (Tables 4a-4d).

As in the previous estimations we pursue the same methodology using FEM with period and cross-section fixed effects. For all the estimations we included the 19 Member-States, 418 observations.

Table 4a – Debt Rules Effectiveness

	I	II	III	IV	V	VI	VII	VIII	IX	X
ELE1	-0.065582	0.133830	-0.015705	-0.024890	0.107566***	0.077056	0.051945	0.007782	-0.052409	0.053426
	(0.258468)	(0.261513)	(0.131812)	(0.062693)	(0.043412)	(0.048713)	(0.061918)	(0.087130)	(0.063479)	(0.048662)
GPD(-1)	0.023740**	-0.022868*	0.015904***	-0.006010**	-0.005553***	-0.007654***	-0.006600**	0.005806*	0.007097***	-0.000784
	(0.010467)	(0.011922)	(0.005712)	(0.002997)	(0.001899)	(0.001837)	(0.003102)	(0.005060)	(0.002861)	(0.001861)
FV(-1)	0.615796***	0.624007***	0.773304***	0.740367***	0.764726***	0.784845***	0.832094***	0.781598***	0.830934***	0.726480***
	(0.149300)	(0.099552)	(0.037157)	(0.055112)	(0.056197)	(0.030729)	(0.035104)	(0.053237)	(0.048638)	(0.038695)
RealGDPGrowth	0.213632***	-0.286697***	-0.113253***	0.052042***	0.004160	-0.056200***	-0.160109***	0.009072	-0.027266**	-0.056344***
	(0.045954)	(0.044143)	(0.024820)	(0.013603)	(0.011891)	(0.012570)	(0.016443)	(0.020406)	(0.012581)	(0.015603)
DEPRATIO	-0.098495*	0.026206	-0.037706	-0.026481	0.017249	0.002581	0.023616**	-0.017172	-0.006728	-0.010417
	(0.054466)	(0.069048)	(0.031549)	(0.018584)	(0.011145)	(0.008618)	(0.010980)	(0.015438)	(0.018862)	(0.010573)
ELE1*DR	-0.337550	-0.159305	-0.420346*	-0.054208	-0.052995	-0.010710	-0.030725	-0.111835	-0.150347	-0.109547
	(0.465559)	(0.447662)	(0.260988)	(0.123993)	(0.069353)	(0.075462)	(0.094322)	(0.145299)	(0.120299)	(0.079068)
GPD(-1)*DR	0.003083	-0.005305	-0.009470*	-0.001845	0.001922	-0.001123	0.002761	-0.005809**	-0.001558	0.001806
	(0.011473)	(0.013640)	(0.005516)	(0.002745)	(0.002026)	(0.001905)	(0.002691)	(0.002575)	(0.002455)	(0.001815)
FV(-1)*DR	-0.124787	-0.049400	0.015334	-0.092505	0.073525	-0.011012	0.027990	-0.001460	0.016554	-0.003848
	(0.152575)	(0.078212)	(0.034594)	(0.095458)	(0.046422)	(0.020371)	(0.026896)	(0.032517)	(0.046191)	(0.014781)
RealGDPGrowth*DR	-0.062985	-0.043128	-0.086099*	-0.040969***	-0.020310	-0.024267**	0.016830	-0.043180*	-0.033849	0.002343
	(0.072631)	(0.048924)	(0.053448)	(0.015026)	(0.013039)	(0.012010)	(0.016083)	(0.023014)	(0.025509)	(0.014967)
DEPRATIO*DR	-0.005433	0.055245	0.007916	0.010479	-0.009513	0.005933	-0.007826	0.011830	0.002658	-0.001084
	(0.018225)	(0.077824)	(0.035431)	(0.009116)	(0.006995)	(0.005820)	(0.006899)	(0.007548)	(0.013192)	(0.004440)
No. Observations	418	418	418	418	418	418	418	418	418	418
Adjusted R-squared	0.693084	0.880027	0.972002	0.765690	0.949172	0.967770	0.984472	0.966362	0.908886	0.989586
F-statistic	20.21789	63.42455	296.4468	28.81000	159.9218	256.5336	540.5520	245.4841	85.89170	809.6495

Notes: * - significant at 10%, ** - significant at 5%, *** - significant at 1%. Standard deviation error in parenthesis. Dependent fiscal variable (FV): I – Net Lending, II – Total Primary Expenditure, III – Total Revenue, IV – Gross Fixed Capital Formation, V – Intermediate Consumption, VI – Compensation of Employees, VII – Social Benefits, VIII – Direct Taxes, IX – Indirect Taxes, X – Social Contributions Received

Table 4a shows the influence of *Debt Rules* on each fiscal indicator and, as expected from our previous results, no relevant interactions are found between the electoral variable and this type of rule, except for *Total Revenue* (regression III). In this case, electoral effects are found in countries that have *Debt Rules* (see estimated coefficient of *ELE1*DR* in regression III).

Irrespectively of following *DR* or not, electoral effects on *Intermediate Consumption* are significant.

Table 4b – Budget Balance Rules Effectiveness

	I	II	III	IV	V	VI	VII	VIII	IX	X
ELE1	-0.546973	0.565743	0.064067	-0.112664	0.159484**	0.157945*	0.122464	-0.008254	-0.159993	0.079085
	(0.408131)	(0.365527)	(0.224678)	(0.126129)	(0.084187)	(0.094202)	(0.105099)	(0.125103)	(0.102168)	(0.087500)
GPD(-1)	0.023961**	-0.044907***	0.003431	-0.004890	-0.004885**	-0.009125***	-0.006944**	-0.002710	0.007610**	-0.000723
	(0.011303)	(0.011421)	(0.006576)	(0.003574)	(0.002182)	(0.002247)	(0.003641)	(0.004135)	(0.003936)	(0.002772)
FV(-1)	0.511693***	0.566614***	0.748139***	0.827877***	0.766959***	0.774949***	0.859790***	0.799127***	0.839269***	0.721921***
	(0.093483)	(0.085925)	(0.041478)	(0.067306)	(0.062165)	(0.037988)	(0.033774)	(0.045547)	(0.041376)	(0.037519)
RealGDPGrowth	0.248620***	-0.279587***	-0.110494***	0.063248***	0.011926	-0.053586***	-0.143893***	-0.014790	-0.024738*	-0.029304***
	(0.055501)	(0.047704)	(0.028604)	(0.016421)	(0.013826)	(0.015719)	(0.023563)	(0.025189)	(0.014615)	(0.012384)
DEPRATIO	-0.105706*	0.080807	-0.026136	-0.030020	0.019763	0.002558***	0.013581	-0.019023	-0.004656	-0.009597
	(0.062206)	(0.076257)	(0.035548)	(0.019823)	(0.013024)	(0.010056)	(0.011876)	(0.017542)	(0.015567)	(0.010900)
ELE1*BBR	0.450917	-0.695549*	-0.333977	0.073221	-0.099417	-0.122451	-0.112825	-0.033003	0.067534	-0.099538
	(0.460382)	(0.429683)	(0.259647)	(0.138304)	(0.091841)	(0.100176)	(0.115245)	(0.149540)	(0.121365)	(0.095151)
GPD(-1)*BBR	0.003790	0.019905*	0.003065	-0.002511	0.000307	0.000347	0.002534	0.003065	-0.001715	0.001806
	(0.010605)	(0.012077)	(0.005516)	(0.003351)	(0.001909)	(0.001765)	(0.003170)	(0.003570)	(0.003171)	(0.002498)
FV(-1)*BBR	0.085168	0.024434	0.022889	-0.190127**	0.044628	0.003846	-0.006222	-0.028864	0.002163	0.000757
	(0.121376)	(0.060115)	(0.033278)	(0.091027)	(0.070631)	(0.031050)	(0.028331)	(0.042367)	(0.042153)	(0.014020)
RealGDPGrowth*BBR	-0.073509	-0.058620	-0.071824*	-0.044948***	-0.027146**	-0.023054*	-0.005929	0.001144	-0.025302	-0.037009**
	(0.069016)	(0.055563)	(0.044571)	(0.017605)	(0.013560)	(0.014501)	(0.024375)	(0.050126)	(0.020739)	(0.016067)
DEPRATIO*BBR	0.008081	-0.035518	-0.011955	0.018437*	-0.002828	0.002707	0.001659	0.005612	0.009510	0.000313
	(0.017308)	(0.052621)	(0.027953)	(0.009800)	(0.009333)	(0.006867)	(0.007887)	(0.008850)	(0.011518)	(0.005051)
No. Observations	418	418	418	418	418	418	418	418	418	418
Adjusted R-squared	0.689824	0.881976	0.971780	0.768554	0.949155	0.968099	0.985950	0.965690	0.907455	0.989986
F-statistic	19.92647	64.59524	294.0535	29.22774	159.8647	259.2627	522.7112	240.5312	84.44679	842.3128

Notes: * - significant at 10%, ** - significant at 5%, *** - significant at 1%. Standard deviation error in parenthesis. Dependent fiscal variable (FV): I – Net Lending, II – Total Primary Expenditure, III – Total Revenue, IV – Gross Fixed Capital Formation, V – Intermediate Consumption, VI – Compensation of Employees, VII – Social Benefits, VIII – Direct Taxes, IX – Indirect Taxes, X – Social Contributions Received

Table 4b shows the influence of Budget Balanced Rules on each fiscal indicator, and looking at regression II we can see that the interaction term between this type of rule and the electoral variable has a significant negative effect on this fiscal indicator; this means that the presence of *BBR* contributes to reduce incentives to increase of public spending in election years. Again, electoral effects on *Intermediate Consumption* apply irrespectively of *BBR* adoption.

Table 4c – Expenditure Rules Effectiveness

	I	II	III	IV	V	VI	VII	VIII	IX	X
ELE1	-0.258862	0.269804	-0.089372	-0.078576	0.152831***	0.071965	0.025996	-0.003825	-0.081803	0.015330
	(0.265329)	(0.281848)	(0.173761)	(0.080631)	(0.051505)	(0.060608)	(0.068364)	(0.100928)	(0.076000)	(0.043006)
GPD(-1)	0.029558***	-0.027245***	0.007932	-0.006803***	-0.004545***	-0.008970***	-0.004504*	-0.000154	0.007745***	0.001560
	(0.008795)	(0.008342)	(0.005382)	(0.002830)	(0.001355)	(0.001498)	(0.002464)	(0.002756)	(0.002526)	(0.001368)
FV(-1)	0.527410***	0.594054***	0.778900***	0.723874***	0.762604***	0.756723***	0.858630***	0.759352***	0.849271***	0.732572***
	(0.066601)	(0.076763)	(0.036027)	(0.057528)	(0.050909)	(0.051229)	(0.050586)	(0.057524)	(0.058196)	(0.034607)
RealGDPGrowth	0.209698***	-0.301674***	-0.138829***	0.032309***	-0.003601	-0.068091***	-0.138437***	-0.025940	-0.028377	-0.040039***
	(0.054778)	(0.043871)	(0.040469)	(0.015739)	(0.013040)	(0.011565)	(0.014400)	(0.020238)	(0.018105)	(0.008041)
DEPRATIO	-0.086368*	0.045824	-0.033214	-0.018329	0.012645	0.007069	0.016833*	-0.010472	-0.002801	-0.014859*
	(0.049240)	(0.061864)	(0.029785)	(0.018741)	(0.010732)	(0.008652)	(0.010406)	(0.015082)	(0.016165)	(0.009203)
ELE1*ER	0.144959	-0.413465	-0.155033	0.063825	-0.128178**	0.004840	0.043049	-0.063320	-0.056695	0.012922
	(0.448883)	(0.441650)	(0.221824)	(0.105206)	(0.065519)	(0.071731)	(0.096893)	(0.139576)	(0.102403)	(0.072948)
GPD(-1)*ER	-0.020491**	0.010529	-0.005852	-0.004377	0.002903**	0.002841	0.001098	0.004170	-0.008383**	-0.000431
	(0.009159)	(0.009616)	(0.005390)	(0.003776)	(0.001489)	(0.001843)	(0.002917)	(0.003841)	(0.003587)	(0.002744)
FV(-1)*ER	0.061192	-0.006739	-0.002864	-0.079106	0.130594***	0.061783**	0.000675	0.024195	-0.044989	-0.006620
	(0.175715)	(0.063867)	(0.024426)	(0.103910)	(0.038364)	(0.051716)	(0.025694)	(0.034608)	(0.044295)	(0.012866)
RealGDPGrowth*ER	-0.016946	-0.042853	-0.050470	0.003161	-0.019958	-0.008672	-0.024640	0.035038	-0.028734	-0.043855***
	(0.082686)	(0.046403)	(0.059308)	(0.016478)	(0.012897)	(0.010901)	(0.018751)	(0.028700)	(0.027025)	(0.015135)
DEPRATIO*ER	0.025173	-0.002211	0.014053	0.010615	-0.016896***	-0.015014**	0.000868	-0.014165*	0.024658**	0.005234
	(0.012943)	(0.055932)	(0.021299)	(0.011119)	(0.005380)	(0.006595)	(0.006678)	(0.007559)	(0.012338)	(0.004209)
No. Observations	418	418	418	418	418	418	418	418	418	418
Adjusted R-squared	0.692797	0.880107	0.971280	0.761666	0.950196	0.967922	0.984109	0.966227	0.910670	0.989990
F-statistic	20.19205	63.47152	288.8016	28.19681	163.3647	257.7860	528.0201	244.4709	87.75657	842.6824

Notes: * - significant at 10%, ** - significant at 5%, *** - significant at 1%. Standard deviation error in parenthesis. Dependent fiscal variable (FV): I – Net Lending, II – Total Primary Expenditure, III – Total Revenue, IV – Gross Fixed Capital Formation, V – Intermediate Consumption, VI – Compensation of Employees, VII – Social Benefits, VIII – Direct Taxes, IX – Indirect Taxes, X – Social Contributions Received

Looking at the results above, we can see that *Expenditure Rules* are effective on reducing electoral incentives to increase *Intermediate Consumption*. *ELE1* has a very significant positive effect on this fiscal indicator, yet *Expenditure Rules* can reduce this effect and that can be seen

in regression V, as the coefficient of the interaction term between *ELE1* and *ER* is statistically significant and negative.

Table 4d – Revenue Rules Effectiveness

	I	II	III	IV	V	VI	VII	VIII	IX	X
ELE1	-0.198193	0.078698	-0.177281	-0.057314	0.106042***	0.074062*	0.034680	-0.041329	-0.118569**	0.007288
	(0.224438)	(0.226445)	(0.132533)	(0.061967)	(0.039348)	(0.044520)	(0.050587)	(0.075143)	(0.061238)	(0.035974)
GPD(-1)	0.027435***	-0.026690***	0.004773	-0.008210***	-0.004438***	-0.009007***	-0.005019**	-0.000541	0.006234***	0.001101
	(0.009091)	(0.008172)	(0.004884)	(0.002842)	(0.001315)	(0.001529)	(0.002523)	(0.002539)	(0.002316)	(0.001285)
FV(-1)	0.575753***	0.584124***	0.776460***	0.712610***	0.770260***	0.760297***	0.869223***	0.755015***	0.843236***	0.733400***
	(0.109675)	(0.086503)	(0.036709)	(0.056148)	(0.048510)	(0.031443)	(0.029943)	(0.035741)	(0.039185)	(0.034808)
RealGDPGrowth	0.191118***	-0.323655***	-0.162646***	0.030819**	-0.004261	-0.070079***	-0.141390***	-0.022567	-0.040563**	-0.048336***
	(0.049637)	(0.038425)	(0.039574)	(0.013895)	(0.011356)	(0.009783)	(0.011030)	(0.017151)	(0.017846)	(0.007449)
DEPRATIO	-0.080624	0.042170	-0.030001	-0.019210	0.012129	0.005820	0.015912	-0.009323	-0.005099	-0.012667
	(0.053306)	(0.060259)	(0.027502)	(0.018844)	(0.010952)	(0.008332)	(0.010045)	(0.014912)	(0.016021)	(0.009714)
ELE1*RR	-0.022843	0.034779	0.065478	0.040430	-0.078669	0.014846	0.075095	0.019697	0.091772	0.034755
	(0.396555)	(0.447655)	(0.266086)	(0.098380)	(0.067713)	(0.079383)	(0.114807)	(0.180347)	(0.117930)	(0.120067)
GPD(-1)*RR	-0.017585	0.017386	0.004741	0.006891**	0.005915**	0.005684**	0.002815	0.011221*	8.46E-05	0.000762
	(0.014675)	(0.016129)	(0.007592)	(0.004400)	(0.002900)	(0.002876)	(0.005511)	(0.006077)	(0.003529)	(0.003023)
FV(-1)*RR	0.071846	0.152003*	0.034409	0.080663	0.138200***	0.067199	-0.001142	0.037075	-0.029892	-0.061558
	(0.137728)	(0.086875)	(0.039935)	(0.090644)	(0.048697)	(0.071174)	(0.066257)	(0.045382)	(0.060891)	(0.066996)
RealGDPGrowth*RR	0.066797	-0.048263	0.027195	-0.000900	-0.022471	-0.026428***	-0.064404***	0.074910**	-0.027080	-0.044131
	(0.081299)	(0.063767)	(0.046259)	(0.016957)	(0.021495)	(0.009206)	(0.019835)	(0.037078)	(0.025397)	(0.028737)
DEPRATIO*RR	0.026540	-0.162027**	-0.040367	-0.013888	-0.020326***	-0.024101	-0.001394	-0.032404***	0.007581	0.020368
	(0.021790)	(0.080030)	(0.036156)	(0.009557)	(0.007663)	(0.015268)	(0.017085)	(0.008930)	(0.017577)	(0.015782)
No. Observations	418	418	418	418	418	418	418	418	418	418
Adjusted R-squared	0.689689	0.881711	0.971154	0.761433	0.949411	0.968111	0.984262	0.967594	0.907180	0.989968
F-statistic	19.91460	64.43388	287.5167	28.16194	160.7136	259.3560	533.2309	255.1055	84.17492	840.7538

Notes: * - significant at 10%, ** - significant at 5%, *** - significant at 1%. Standard deviation error in parenthesis. Dependent fiscal variable (FV): I – Net Lending, II – Total Primary Expenditure, III – Total Revenue, IV – Gross Fixed Capital Formation, V – Intermediate Consumption, VI – Compensation of Employees, VII – Social Benefits, VIII – Direct Taxes, IX – Indirect Taxes, X – Social Contributions Received

Overall results show no significant coefficients on the interaction term between *Revenue Rules* and the electoral variable, meaning that this type of rules is not enough to control political incentives, namely on *Intermediate Consumption*, *Compensation of Employees* and *Indirect Taxes*.

In the table below we can see the main findings regarding these fiscal rules on the impacts of other variables on *FV*:

Table 5 – Fiscal rules on the impacts of other variables on FV

Independent variable	Fiscal Rule	Action	Impacted Variables
FV(-1)	ER	Increases persistency	Intermediate Consumption
			Compensation of Employees
	RR		Total Expenditure
			Intermediate Consumption
	BBR	Decreases persistency	Public Investment
GPD(-1)	RR	Accentuates debt correction	Direct Taxes
	DR	Reduces debt correction	Total Revenue
			Direct Taxes
	BBR		Total Expenditure
	ER		Net Lending
			Intermediate Consumption
			Indirect Taxes
	RR		Public Investment
			Intermediate Consumption
			Compensation Employees
Real GDP Growth	RR	Increases pro-cyclicality	Direct taxes
	DR	Reduces pro-ciclicality	Total Revenue
			Direct taxes
			Public Investment
			Compensation of Employees
	BBR		Total Revenue
			Public Investment
			Intermediate Consumption
			Compensation of Employees
			Social Contributions
	ER		Social Contributions
	RR		Compensation of Employees
			Social Benefits
DepRatio	BBR	Accentuates positive reaction of FV	Public Investment
	ER		Indirect Taxes
	ER	Reduces positive reaction of FV	Intermediate Consumption
			Compensation of Employees
			Direct Taxes
	RR		Total Expenditure
			Intermediate Consumption
			Direct Taxes

4. Conclusions

Although the fact that in the empirical literature we do not find a consensus regarding the existence of political cycles, the main objective of this study is to answer some questions for the EMU area: Do governments manipulate budget composition at a disaggregated level, for incumbents to secure reelection? If yes, in which categories? If yes, how does this motivation and feedback reactions are shaped by (different types of) fiscal rules? Did the Great Recession crucially changed fiscal reaction functions, namely to political cycles?

Thus, in order to obtain answers to these questions, we estimate an econometric model using panel data of the 19 member states of the EMU, covering the period 1996-2018. We considered three levels of budget disaggregation and estimated ten regressions for the dynamics of alternative fiscal instruments as percentage of GDP – (I) *Net Lending*, (II) *Total Primary Expenditure* and *Total Revenue*, and (III) *Gross Fixed Capital Formation*, *Intermediate Consumption*, *Compensation of Employees*, *Social Benefits*, *Direct Taxes*, *Indirect Taxes* and *Social Contributions Received*. The estimated models controlled for electoral periods and a composite fiscal rule index in cross terms with standard feedback variables of policy reaction functions besides the electoral dummy. Additionally, we controlled for alternative types of fiscal rules: *Debt Rules (DR)*, *Revenue Rules (RR)*, *Expenditure Rules (ER)* and *Budget Balance Rules (BBR)*.

A first finding is that there is no relevant electoral effect in *Net Lending* in this type of countries, as already confirmed in Santos (2014) as well as in the literature review, which indicates that the non-existence of fiscal political cycles at this first level would be due to the presence of *BBR*, since they constrain the accumulation of high deficits - Gootjes, Haan and Jong-A-Pin (2019) and Brender and Drazen (2005). Nevertheless, there are some authors who disagree with this hypothesis, arguing that rules fail to prevent budget cycles. Yet, we found a very significant electoral effect regarding the same fiscal indicator in the period before the global crisis, which disappears after 2009. However, incentives for political cycles on *Net Lending* is independent of the fiscal rule index (*FRI*).

Secondly, we found no electoral effects at the second level of disaggregation of fiscal variables – *Total Expenditure* and *Revenue* - for the whole period. However, looking at the period before crisis there are signs of electoral cycles in *Total Primary Expenditures*, which (also) disappears after the crisis, but still independent of *FRI*. At a more disaggregated level of *Total Expenditure*, we found a positive significant effect of the electoral variable on *Intermediate Consumption* and *Compensation of Employees*; larger compliance with fiscal rules significantly reduces the motivation to generate political cycles in consumption but not in

the wage bill. Moreover, effectiveness of fiscal rules to reduce voting incentives is only evident in the period after the 2009 crisis, while the electoral effect on *Compensation of Employees* disappears.

We did not find any significant results for what concerns *Social Benefits* in the whole period and the same happened when comparing both periods, which may be due to larger compliance with fiscal rules.

In terms of Revenue, before 2008, electoral effects are found in *Direct Taxes*, independently of *FRI* while, after 2008, *Indirect Taxes* are the ones to display a significant electoral impact, although limited by more stringent *FRI*.

Fiscal Rule Index, after 2008, determines, by its own, higher revenues, namely *Social Contributions*, and smaller *Intermediate consumption*, but allows for a higher weight of *Compensation of Employees*. On average, *FRI* reduces the negative feedback of expenditures (total, *Intermediate consumption* and *Social Benefits*), providing better debt stabilization through the expenditure side. *FRI* also makes less pro-cyclical both expenditures (*Public Investment* and *Compensation of Employees*) and revenues (*Total, Indirect Taxes* and *Social Contributions*), enhancing the stabilization role of the expenditures, while destabilizing that of revenues.

In conclusion, these results confirm the existing literature indicating that currently, political cycles only appear at disaggregated budgetary levels in EMU, on both expenditure (*Intermediate Consumption* and *Compensation of Employees*) and revenue (*Indirect Taxes*) categories; although fiscal rules do not fully prevent electoral cycles, more stringent rules lead to less incentives to promote political cycles on these variables.

Ideally, fiscal rules should target a specific budget subcategory, so that they would be more effective and thus more successful in deterring fiscal manipulation.

Political cycles in *Total Expenditure* occur when no *BBR* are in place (Table 3a), as the presence of *BBR* crucially reduces incentives to political cycles on *Total Expenditure* (Table 4). The adoption of *ER* is also effective in reducing political incentives to manipulate, in particular, *Intermediate Consumption* (Table 3c), although they are not enough to completely reduce political cycles, as we could see in Table 4c and *Compensation of Employees* (Table 3c).

In turn, political cycles in *Total Revenue* occur even under *BBR* or *DR* (Table 3a and 3b); evidence regarding the disciplinary role of *RR* is mixed (Table 3 *vs* 4). Regarding the impact of each type of rule on the lagged fiscal variable, we see that *ER* increases the persistency on *Intermediate Consumption* and *Compensation of Employees* and the

same happen regarding *RR* on *Total Expenditure* and *Intermediate Consumption*, while *BBR* decreases persistency on *Public Investment*.

This evidence suggests that, although the fact that Fiscal Rules have not been completely effective in their roles, they have some relevance in constraining the impact of electoral manipulation in some budget balance categories.

The empirical study would have benefitted greatly if it would have been possible to study the whole sample for a longer period of time, but there were data restrictions regarding the most recent members of the Eurozone (namely Estonia, Latvia, Slovenia and Slovakia), and the same happen for what concerns *FRI*, as it only exists since 1990. That would have allowed to observe a possible trend of which budget category has been preferred for governments to manipulate over these years and the evolution of the impact and strength of fiscal rules for each fiscal variable.

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Annex I

Correlated Random Effects - Hausman Test
Equation: NET_LENDING
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	22.020592	5	0.0005

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	14.462728	5	0.0129

Correlated Random Effects - Hausman Test
Equation: TOTAL REVENUE
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	22.035591	5	0.0005

Correlated Random Effects - Hausman Test
Equation: GROSS_FIXED_CAPITAL_FORMATION
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	1.996551	5	0.8496

Correlated Random Effects - Hausman Test
Equation: INTERM_CONSUPTION
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	3.637193	5	0.6027

Correlated Random Effects - Hausman Test
Equation: COMPENSATION_OF_EMPLOYEES
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	3.941152	5	0.5579

Correlated Random Effects - Hausman Test
Equation: SOCIAL_BENEFITS
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	18.588814	5	0.0023

Correlated Random Effects - Hausman Test
Equation: DIRECT_TAXES
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	11.000031	5	0.0514

Correlated Random Effects - Hausman Test
Equation: indirect_taxes
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	12.696462	5	0.0264

Correlated Random Effects - Hausman Test
Equation: ACTUAL_SOCIAL_CONTRIBUTIONS
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	12.781105	5	0.0255

Annex II

Redundant Fixed Effects Tests
Equation: NET_LENDING
Test cross-section and period fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	8.301524	(18,391)	0.0000
Cross-section Chi-square	141.436275	18	0.0000
Period F	3.427787	(22,391)	0.0000
Period Chi-square	77.069472	22	0.0000
Cross-Section/Period F	6.059996	(40,391)	0.0000
Cross-Section/Period Chi-square	210.806325	40	0.0000

Redundant Fixed Effects Tests
Equation: TOTAL_PRIMARY_EXPENDITURE
Test cross-section and period fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	51.829259	(18,391)	0.0000
Cross-section Chi-square	532.986956	18	0.0000
Period F	2.989612	(22,391)	0.0000
Period Chi-square	67.942844	22	0.0000
Cross-Section/Period F	25.541776	(40,391)	0.0000
Cross-Section/Period Chi-square	561.339603	40	0.0000

Redundant Fixed Effects Tests
Equation: TOTAL_REVENUE
Test cross-section and period fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	156.744547	(18,391)	0.0000
Cross-section Chi-square	920.351112	18	0.0000
Period F	1.445703	(22,391)	0.0892
Period Chi-square	34.175423	22	0.0471
Cross-Section/Period F	75.729382	(40,391)	0.0000
Cross-Section/Period Chi-square	947.739170	40	0.0000

Redundant Fixed Effects Tests
Equation: GROSS_FIXED_CAPITAL_FORMATION
Test cross-section and period fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	21.136422	(18,391)	0.0000
Cross-section Chi-square	296.972770	18	0.0000
Period F	1.643275	(22,391)	0.0347
Period Chi-square	38.644998	22	0.0155
Cross-Section/Period F	10.152715	(40,391)	0.0000
Cross-Section/Period Chi-square	311.267826	40	0.0000

Redundant Fixed Effects Tests
Equation: INTERM_CONSUPTION
Test cross-section and period fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	70.076710	(18,391)	0.0000
Cross-section Chi-square	629.832745	18	0.0000
Period F	1.781133	(22,391)	0.0170
Period Chi-square	41.736827	22	0.0067
Cross-Section/Period F	32.884034	(40,391)	0.0000
Cross-Section/Period Chi-square	643.880590	40	0.0000

Redundant Fixed Effects Tests
Equation: COMPENSATION_OF_EMPLOYEES
Test cross-section and period fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	142.538310	(18,391)	0.0000
Cross-section Chi-square	884.102555	18	0.0000
Period F	1.450272	(22,391)	0.0873
Period Chi-square	34.279293	22	0.0460
Cross-Section/Period F	65.797774	(40,391)	0.0000
Cross-Section/Period Chi-square	893.782106	40	0.0000