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The Roots of the Eurozone Sovereign Debt Crisis: PIGS vs Non-PIGS

Summary: The main purposes of this paper are twofold: a) to determine if there are significant differences on the determinants of public expenditures and tax revenues between the so-called PIGS and the remaining Eurozone member states; b) to uncover possible explanations for the different situations in which these countries find themselves nowadays. The paper focus on the effects of the cyclical state of the economy on those fiscal variables, and on the actual adherence to the fiscal rules imposed by the Maastricht Treaty. Based on the estimated results we conclude that the anti-cyclical reaction with respect to the unemployment rate is much stronger among non-PIGS. We also find that fiscal rules have, in general, not been followed by those two groups of countries. Moreover, PIGS, in spite of their economic frailties, have tried to emulate the fiscal behavior of their more prosperous Eurozone partners instead of executing more rigorous policies.

Key words: European public finance, Fiscal policy, Fiscal rules.

JEL: H2, H5, H6.

After the debacle of the financial markets during the years of 2007 and 2008, since 2009, and especially since 2010, financial markets have been highly affected by deeply felt concerns on the solvency of some European States. At the heart of this crisis of confidence on sovereign debt is the Eurozone due to the unsatisfactory performance of the so-called PIGS: Portugal, Ireland, Greece and Spain. In the meantime the case of Italy is becoming more and more acute. These concerns are strong barriers to the full normalization of the workings of the financial markets worldwide, in addition to being a serious obstacle to a faster and stronger economic recovery. Besides, they have generated a good deal of stress in the cohesion of the Eurozone itself while, at the same time, leading the European Central Bank (ECB) to adopt highly controversial policies in support of the Eurosystem. One such measure is the programme to purchase sovereign debt issued by PIIGS which, in fact, amounts to indirect monetization of public deficits. In short, what is being put into question is the configuration and workings of the Eurozone itself and even its sustainability in the near future.

There is an abundant and diversified theoretical and empirical economic literature that tries to explain governments' positive fiscal behavior. That literature emphasizes economic, institutional, demographic and political variables as the driving forces behind the secular growth of the public sector, of the asymmetric nature of

discretionary fiscal policies over the business cycle, as well as the expected behavior between revenues and expenditures throughout the cycle. Another aspect analyzed by this literature is the procyclicality of those policies among industrialized countries. However, at least to the best of our knowledge, the impact of fiscal rules, such as restrains on the public deficit, on the stock of sovereign debt and on the power to borrow, as a proportion to GDP, on dependent fiscal variables like taxation, expenditure and government's budget balance, has received much less attention from the empirical literature.

Given that the center of the public debt crisis is the Eurozone, the main goal of this paper is to identify significant differences in the behaviour of public expenditures and tax revenues between the so-called PIGS and the remaining Eurozone member states which might offer some clues on why the former are confronted with so serious problems from which the latter are apparently exempted. At the time we did this research, Portugal, Ireland and Greece had already been intervened by the EU, ECB and IMF. Spain was suffering huge pressions from the markets that were betting it would be the next country to follow. However, the seriousness of the sovereign debt crisis in the Eurozone has been increasing at a high rate, such that in a contagion process, it is now Italy which is under pressure while other countries are being mentioned as being in jeopardy, mainly France and Belgium. The comprehensive model we rely on, besides testing for the effective implementation of fiscal rules, also incorporates variables for the economic, political, demographic, and institutional dimensions taken into account by the most significant theoretical contributions on positive public finances.

The paper is organized as follows: Section 1 briefly reviews the underlying literature, Section 2 refers to the model and the data set, Section 3 discusses the estimated results, and Section 4 reports the conclusions.

1. The Determinants of Fiscal Policy

We consider the unemployment rate and trade openness as the economic determinants of fiscal policy; the other explanatory variables considered in the model are institutional, demographic and political in nature.

The output gap is an alternative to the unemployment rate. However, the unemployment rate is more objective in its quantification, available to the public in general on a monthly basis, well understood by everybody and waited by the markets as a good indicator of the state of the economy. Besides, since it directly affects the well-being of the electors and their opinions on the government, politicians feel obliged to respond to it by means of appropriate discretionary fiscal policies. In fact, the well-known Phillips curve chooses the unemployment rate as one of the variables in play, no matter its version depending on the economic school dealing with it. According to Keynesians, we should observe a negative relationship between the unemployment rate and tax revenues, and the inverse relationship with public expenditures. Likewise, that relationship follows from the neoclassical tax-smoothing hypothesis, provided budget imbalances are temporary, in order to minimize intertemporal social welfare losses from taxation for a given path of government spending (Robert Barro 1979). However, numerous empirical papers have detected procyclical

fiscal policies instead; Joshua Aizenman, Michael Gavin, and Ricardo Hausmann (1996), Michael Gavin et al. (1996) and others have uncovered empirical evidence of procyclicality in Latin American countries, which they explain by access restrictions to capital markets by those countries during recessions. Ernesto Talvi and Carlos Végh (2005) find that procyclicality is the rule rather than the exception and applies to industrialized countries as well. The explanatory hypothesis put forward by these authors is the higher tax base volatility in developing countries and the ensuing management of public revenues and expenditures to minimize welfare losses on the face of pressures from interest groups to increase spending during booms and otherwise during recessions. Close to this hypothesis is the so-called voracity effect proposed by Aaron Tornell and Philip Lane (1999) which states that during upturns the various constituencies compete for a share in the growing tax revenues such that expenditures increase more than proportionally to income. This last line of thought introduces asymmetric behavior of discretionary fiscal policies throughout the cycle, that is, countercyclical during recessions but procyclical during growth periods.

Trade openness is a variable very often present in these models since early times. David Cameron (1978) includes it as part of the international explanation of the expansion of the public sector. A first line of reasoning considers that open economies are exposed to world markets fluctuations out of their control and, therefore, are subject to increased volatility of the business cycle. A way to manage this higher risk is through increased government intervention in the economy with particular emphasis on the social sector, as pointed out by Gunnar Myrdal (1960), and others. Accordingly, it should be expected state expenditures to increase through subsidies to unemployed workers and to enterprises to retrain and retain workers in bad times, and through larger public employment. However, this analysis abstracts from the implications of increased international economic integration, and the progressive dismantling of tariff barriers, which tear down the effectiveness of those attempts to insulate national economies from unfavorable outside events. Therefore, these other circumstances could reduce both tax revenues and public expenditures as economies become increasingly more open and, accordingly, change the expected signs of the coefficients as put forward by Cameron (1978).

Budgetary procedures and fiscal rules aimed at constraining government behavior have been the focus of both theoretical and some empirical contributions by authors such as Mark Hallerberg and Jürgen J. von Hagen (1999), Hallerberg and Rolf Strauch (2002), and Hallerberg, Strauch, and von Hagen (2007) within the context of the EMU and the Stability and Growth Pact. Fiscal rules are quantitative targets for main fiscal variables. Likely rules are the ones adopted by the Eurozone countries in relation to the general government sector in proportion to GDP: annual budget deficit limited to 3% of GDP and debt not exceeding 60%. Von Hagen and Guntram Wolff (2006) provide empirical confirmation of creative account practices in the EU to circumvent that type of rules and ease fiscal deficits, namely stock-flow adjustments. Hallerberg, Strauch, and von Hagen (2007) test a model where the dependent variable, the change in gross debt as a share of GDP, is regressed against several explanatory variables, among which fiscal rules, such as an indicator for borrowing limits imposed on sub-national governments and a 3% deficit to GDP. In our

paper we investigate if the two fiscal rules imposed by the Maastricht Treaty are obeyed or not by Eurozone member states. In the model, they are dependent variables lagged one period because information costs do not allow for within period government fiscal reactions to deviations of actual values from the targets. If this rule is effectively pursued, deviations of the stock of debt, as a proportion of GDP, from the 60% rule should have a positive association with revenues and negative with government expenditures, and the opposite otherwise. Deviations of the fiscal surplus, as a proportion of GDP, from -3% of the GDP, should evidence a positive relationship with expenditures and negative with revenues for us to conclude that the rule is being pursued; but if the estimated signs are reversed, it is because countercyclical policies are being conducted instead.

Following the tradition of the public choice literature on the median voter and interest groups (Mancur Olson 1965; Allan Meltzer and Scott Richard 1981), we analyze the effect of the following demographic and institutional variables: the fraction of elderly population, and union density. In average, members of both groups have incomes equal or lower than median income which, following Meltzer and Richard (1981), is lower than average income. These groups favor income redistribution to their benefit and vote on political parties that respond positively to them. In fact, the composition of government spending has significantly evolved towards social transfers in the last forty years. The associated impact on tax revenues is much less well studied in the literature but it seems reasonable to assume that they should increase less than proportionally to welfare state expenditures on the grounds of the fiscal illusion argument.

Political fragmentation is as a potential driving force behind government spending. In this sense the budget is a product of the competition among different political constituencies for budgetary benefits. Yianos Kontopoulos and Roberto Perotti (1999) distinguish between political fragmentation, either the number of parties in the coalition (the legislative interpretation) or the number of spending ministers (the executive interpretation), and institutional fragmentation dealing with different budgetary procedures (all rules dictating how budgets are prepared, approved and executed by politicians and the bureaucracy) and fiscal discipline rules (Alberto Alesina and Perotti 1996; Hallerberg, Strauch, and von Hagen 2007). Political fragmentation transforms the budgetary process into a common good since benefits are highly concentrated on the beneficiary interest groups whereas costs are spread all over. Higher fragmentation tends to be synonymous with government weakness and produce higher expenditure and higher deficits. The expected impact on tax revenues is less well established in the literature. In the presence of various approaches to this point we come to the conclusion that, indeed, the literature does not offer unequivocal indications on the effects of fragmentation on taxation. Alesina and Guido Tabellini (1990) emphasize a closely related feature: whenever the winning party is randomly determined, or the party in power expects to lose the next elections, the government in office tends to increase expenditures and debt, accordingly reducing the ability of its successor to implement its own programme.

The effect of elections and the new ideological composition of the cabinet are considered to capture the possible influence of political business cycles (PBC) generated through fiscal policy. This literature dates back to William Nordhaus (1975),

Douglas Hibbs (1977), and Cecil MacRae (1977), who argued that governments and political parties manipulate the economy to win elections. Their arguments have given rise to the opportunistic and partisan hypothesis. According to the former, incumbent governments inflate the economy prior to elections in order to maximize their probabilities of being re-elected, and contract them once having attained their goals, that is, during the first half of their terms in office. The second hypothesis states that macroeconomic management depends on the specific interests of their constituencies, namely the ideological tenets pursued by the government in office; in particular, left wing governments tend to pursue more inflationary policies than right wing ones because unemployment is their priority. Their hypothesis lies on the assumptions that there is a trade-off between the unemployment rate and expected inflation along the lines of a downward sloping Phillips curve, with expectations being formed adaptively. However, in more recent times, the independence of central banks in the conduct of monetary policy has been reinforced as a key policy goal, in addition to the establishment of the ECB with responsibilities all over the Eurozone. As a result, national governments no longer control monetary policy, unless the board of the central bank is ready to accommodate the objectives of the administration. A second difficulty arises in case rational expectations prevail; if that is the case there is no way governments can exploit such a trade-off since now voters have full information and adjust instantaneously to expansionary policies. Later on, Torsten Person and Tabellini (1990), Keneth Rogoff (1990), and Susanne Lohmann (1998) redefined the assumptions of the theory assuming rational voters with imperfect information. In what concerns taxes, these approaches agree that voters prefer lower to higher taxes. As stated by Lohmann (1998), *"... an incumbent of above-average quality is more likely to survive voter scrutiny... ."*

On the other hand, enforcing transparent fiscal rules restricting fiscal deficits, public debt or both to maximum values constraints the ability of incumbents to run explicit political budget cycles (James Alt and David Lassen 2006). In this case voters punish candidates who violate those rules. Instead, politicians can resort to changes in the composition of public expenditure, favoring special items such as those identified with the welfare state; in fact, higher social expenditures during electoral periods find strong support in the literature (Allan Drazen and Marcela Eslava 2005) and, in this sense, we would now have cycles in the budget composition of expenditures to signal competence (Christina Schneider 2010). Considering the enormous diversity of the literature on this topic, plus the fact that we use aggregate data on fiscal variables and that all the empirical evidence on PBC is quite mixed (Schneider 2010, p. 128), we do not have a priori expectations on the significance and signs of the coefficients to be estimated on the last variables mentioned.

2. Model and Data Set

A panel data approach, controlling for countries' and time fixed effects, is used to estimate the effects of the cyclical state of the economy and of the two fiscal rules imposed by the Maastricht Treaty on fiscal variables. Since the data set includes all the countries, it seems to be preferable to employ the fixed effects estimation. Besides, Hausman test (Jerry Hausman 1978) indicates that fixed effects specification is preferable to a random effects model:

$$F_{i,t} = \alpha_i + \omega_t + \beta_1 U_{i,t} + \beta_2\left(DEBT_{i,t-1} - 60\%\right) + \beta_3\left[GGS_{i,t-1} - 3\%\right) + \gamma \mathbf{X}_{i,t} + \varepsilon_{i,t} \quad (1)$$

where the fiscal dependent variable for country i at time t, $F_{i,t}$, is either general government outlays or total tax revenues, both evaluated as a proportion to GDP. In fact, total tax revenues evaluated in this manner turn out to be the effective average tax rate. The paper focus on the reaction of these variables to the unemployment rate, $U_{i,t}$, as a proxy of the cyclical state of the economy, and on the deviation from the fiscal targets defined by the Maastricht Treaty: the deviation of government debt as a percentage of GDP, $DEBT_{i,t}$, to the fiscal target, 60%, and the deviation of government surplus as a percentage of GDP, $GSS_{i,t}$, from the fiscal target, -3%. To account for possible reverse causality running from fiscal policy to deviations from the fiscal targets we instrument the fiscal target variables with their own first lags. $\mathbf{X}_{i,t}$ is a vector of other economic, demographic, institutional and political variables viewed as control variables. It includes: the degree of openness of the economy in current prices, measured as total trade (sum of imports and exports) as a percentage of GDP, $OPENC_{i,t}$; the fraction of total population whose age is at least 65 years old, $ELDERLY_{i,t}$; net union membership as a proportion of wage and salary earners (trade union density), $UDENSITY_{i,t}$; a dummy variable, $ELECTIONS_{i,t}$, that is (1) if there are elections in year t, and (0) otherwise; a variable that captures the ideological composition of the cabinet, $GOV\_PARTY_{i,t}$, and which assumes the values (1) hegemony of right-wing parties, (2) dominance of right-wing parties, (3) balance of power between right and left, (4) dominance of social-democratic and other left parties, (5) hegemony of social-democratic and other parties; a variable that captures the level of political fragmentation, $GOV\_TYPE_{i,t}$, and which assumes the values (1) single party majority government, (2) minimal winning coalition, (3) surplus coalition, (4) single party minority government, (5) multi party minority government, (6) caretaker government; a dummy variable that captures the new ideological composition of the cabinet, $GOV\_NEW_{i,t}$, and which assumes (1) for change, (0) for no change.

All the variables, except tax revenues and general government surplus, are from Comparative Political Data Set (Klaus Armigeon et al. 2010), which is a collection of political, institutional, demographic, and socio and economic annual data for 23 currently democratic countries for the period of 1960 to 2008. Data for tax revenues and general government surplus are from OECD Economic Outlook Statistics and Projections.

The model is estimated for the period 1970-2008 (38 years of observations), and just taking into account the 12 initial Eurozone countries. The panel is unbalanced due to missing observations. (summary statistics are in Table 1 in Appendix). In so being, the sample covers both prior and subsequent time periods to the actual adoption of the Euro. Indeed, considering the requisites imposed by the Treaty of Maastricht, those countries took measures to adjust their economies in preparation for the new currency with a special emphasis on those intended for nominal convergence.

To account for a different reaction of the fiscal variables to the unemployment rate and to the deviation from the fiscal targets after the adoption of the Euro a multiplicative dummy variable, $EURO99_{i,t}$, for each the main explanatory variables was introduced in the model. The dummy variable takes the values (0) for years before the adoption of the Euro, and (1) for years after the adoption of the Euro.

Finally, to study the possibility of a different reaction of the fiscal variables to the main explanatory variables in the so-called PIGS and in the remaining member states a multiplicative form dummy, $PIGS_{i,t}$, was introduced in the model. $PIGS_{i,t}$ takes the values (1) for Portugal, Ireland, Greece and Spain, and (0) for the remaining countries. As stated earlier, given that PIGS have experienced seriously unbalanced public finances and face actual or market perceived insolvency crisis, this paper compares the fiscal behavior of these two groups of countries in search for an explanation for the actual diverse situations in which they find themselves in the present Eurozone predicament.

3. The Estimated Results

3.1 Base Model Results

The results of the estimation for the baseline model are displayed in Tables 2 and 3 in Appendix (column I). All the regressions are overall significant and have high explanatory power.

The first results to be noticed are: a) in general, the estimated coefficients on the government tax receipts equation are, in absolute value, smaller than those on outlays, showing that fiscal policy is stronger on the expenditure side than on the revenue side; b) the asymmetry of fiscal policy is exposed by the positive signs of the highly significant estimated coefficients for the unemployment rate on both expenditures and tax revenues, as well as for the estimated coefficients on the deviations of the debt stock and government surplus from its targets.

In both instances the estimated coefficients on the rate of unemployment are positive. Therefore, expenditures are anti-cyclical whereas tax revenues are pro-cyclical, even though with a substantially lower estimated coefficient. This result can also be inferred from Figures 1 and 2 in Appendix. Government expenditures are more correlated with the unemployment rate than tax revenues. Our tentative explanation for this result rests on the possible association between a progressive tax system and concentration of unemployment among lower income taxpayers. Indeed, in a recession or depression scenario a progressive tax system may lead to an increase in the average tax rate as long as taxable income decreases more than proportionally to tax revenues. This is the case if unemployment and income losses are concentrated among low wage earners tax at lower marginal tax rates. Let´s denote tax revenues by T, total income by Y divided among low-income people, Y_L, and high-income individuals, Y_H. The former are taxed at a marginal tax rate T_L, whereas the others´ marginal tax rate is T_H, such that $T_H > T_L$. In addition, we assume the existence of another marginal tax rate lower than T_L. Therefore, the average tax rate T_{av} is given by $\frac{T_H Y_H + T_L Y_L}{Y_L + Y_H}$. To see how the average tax rate changes with time, as income changes,

we take logs of the above expression and then differentiate it with respect to time (t). To meet our argument, we assume that only Y_L changes and, consequently, the same may happen to the corresponding marginal tax rate. Therefore, $\frac{dlogT_{av}}{dt} = \frac{1}{T_H Y_H + T_L Y_L}\left(T_L \frac{dY_L}{dt} + Y_L \frac{dT_L}{dt}\right) - \frac{1}{Y_L + Y_H}\frac{dY_L}{dt}$. As we can see, the sign of the expression depends on the relative magnitudes of the two members in the right hand side of the equality. If this is the case, then higher income groups are the ones that gain the most and lose the least, respectively during booms and recessions. This is a very significant outcome because even though budgetary policy is anti-cyclical as a whole, as conveyed by the whole set of the reported regression coefficient estimates on the unemployment rate, the anti-cyclical effectiveness of expenditures is significantly weakened by the behavior of the effective tax rates. In case this tentative hypothesis is confirmed by further empirical research, we would have an additional good reason to suggest the reform of the present day tax system in order to improve its ability to pursue macroeconomic stabilization goals.

Regarding fiscal rules, deviations of the debt stock from the 60% target induce feeble expenditure adjustments, but there is no significant reaction from tax revenues. Let's now turn to the other fiscal rule. Deviations of the lagged one period budget surplus from the -3% target are negatively related to expenditures and positively related to tax revenues. These results mean that the fiscal rule was not followed; instead, anti-cyclical policies persist over time with diminishing strength, moreover supporting the estimated net effects mentioned above regarding unemployment.

Contrary to past predictions (Cameron 1978), but more in line with contemporary economic structural developments as envisaged by Raymond Vernon (1974) and others, both fiscal dependent variables (outlays and tax revenues) are negative and significantly related to the degree of trade openness of the economies.

Both unionization and elderly impact positively on the two dependent fiscal variables under analysis, as expected, exposing their redistributive influences. As population gets older, it becomes unsustainable to keep the same level of social transfers and services because they require higher taxes on a shrinking working fraction of a country's population with undesirable effects on working incentives.

On the government expenditures equation political variables do not play any meaningful influence with the exception of the government type variable. The detected negative relationship between government type and government expenditures is the reverse of what we would expect on the assumption that coalition governments are weaker than single party majority governments and, as consequence, lacking political muscle to cut on expenditures and raise taxes. However, as already noticed in the literature, it is not necessarily true that coalition governments are weaker than single party majority governments; in difficult times it is quite common the formation of coalition governments that join all major political parties to achieve unquestionable national interest outcomes (national unity governments), whereas it might happen that the authority of single party majority governments is eroded by disputes within the sustaining party, with the ensuing lack of internal cohesion. The most up to date example of what has just been said is the present day conservative-liberal coa-

lition in the UK which is currently pursuing substantial and decisive expenditure cuts, and the previous labor government led by Mr. Gordon Brown.

Interestingly enough, in years of elections we observe a strong negative relationship with tax revenues, and none whatsoever with expenditures, which we interpret as evidence of the opportunistic view. As far as one can understand, this indicates that in years of elections the best strategy for governments to win re-elections is to lower taxes favoring voters in general, and conceivably tax discriminate in favor of special interest groups disguised under the mantle of a general tax reduction, rather than raising expenditures. The perception by electors with respect to tax reductions is swifter because their personnel potential gains need a shorter time lag to become effective, are more internalized and less diffused than they would be under an expenditure approach.

Ideology plays no role on the behavior of the two dependent fiscal variables, as shown by the statistical non-significance of both government party and government new variables. We could therefore conclude that ideology has lost its appeal in the real politics of the Eurozone due to the repositioning towards the political centre by some influential European political parties, mainly the labor party in the UK under the leadership of Tony Blair, the socialist party in France under Miterrand and the German social-democrats since Willy Brandt, explained by the constraints put in place by the EU construction. Or, in alternative, along the lines proposed by Schneider (2010), their influence happened on the composition of the variables in question rather than on their amounts.

3.2 The Effect of the Euro

Since the Maastricht Treaty until the start of the recent financial crisis fiscal policy in the Eurozone has become more homogeneous. The standard deviation of government outlays and tax revenues has shown a tendency to fall (see Figure 1 and 2 in Appendix). This has led to an approximation of the average level of government surplus in PIGS and non-PIGS countries especially in the years prior to this financial crisis. The standard deviation of general government surplus has indeed fallen since 1992. On the revenue side this tendency was, however, reversed since 2007. The consequence was an increase in the PIGS's average general government deficit relative to non-PIGS after the recent financial crisis (see Figure 3 in Appendix). Part of the explanation lies on the different behavior of the unemployment rate in the two groups of countries. After a prolonged period of decrease in the standard deviation of the unemployment rate in the Eurozone, which is an indicator of more homogeneous economies, recently it has increased much more among PIGS than with non-PIGS (see Figure 3 in Appendix).

In a second step, and to account for a possible policy regime shift after the adoption of the Euro, we re-estimated our model differentiating between the effects of the main three variables on fiscal policy before and after 1999. The results are reported in Tables 2 and 3 in Appendix (column II). The reaction of fiscal variables to the unemployment rate increases after 1999 (we read the reaction of fiscal variables after 1999 as the sum of the estimated coefficients of $U_{i,t}$ and $U_{i,t} \times EURO99_{i,t}$). That is, expenditures are more anti-cyclical, while tax revenues have become more pro-cyclical.

Concerning the reaction of fiscal variables to the deviations of the lagged debt stock from the 60% target, we do not found any regime shift on the expenditure side, but there is a significant, although weak, increase on the tax revenues side.

Deviations of the lagged budget surplus from the -3% target are still negatively related to expenditures, although the coefficient is lower after 1999 (we read the reaction expenditures after 1999 as the sum of the estimated coefficients of $\left[GGS_{i,t} - (-3\%)\right]$ and $\left[GGS_{i,t} - (-3\%)\right] \times EURO99_{i,t}$), and positively related to tax revenues, meaning that the fiscal rule is not being followed after the adoption of the EURO.

3.3 PIGS *vs* Non-PIGS

Figures 4 to 6 in Appendix show the positions of the individual Eurozone countries concerning their relationships between GDP growth rates and the general government surplus as a proportion of GDP. Three different periods are considering for these scatter plots: *a*) the whole period of the sample; *b*) the period before the Euro, and *c*) the period after the actual adoption of the Euro.

Concerning the general government surplus variable and the whole period under consideration some facts stand-out: *i*) Greece and Portugal are very close to each other, but significantly apart from Spain and Ireland; *ii*) with the exception of Italy and Belgium, all the remaining non-PIGS are in a relatively better position than PIGS. In fact, for the whole period, Spain and Ireland are quite apart from Greece and Portugal; for roughly the same average GDP growth rate, Spain evidences a much better performance with respect to the budget balance, positioning itself in the same group as Germany, Austria, France and others. Ireland, on the other hand shows a much higher GDP growth rate than the other 3 countries of the group, but a worse performance when compared with all other countries with the exception of Belgium, Italy, Portugal and Greece. Indeed, with GDP growth rates lower than the ones observed for PIGS, most of the non-PIGS expose a better performance concerning the budget, with special emphasis for Finland and the Luxembourg. For Portugal the Euro had a strong negative impact which is unique among PIGS: the GDP growth rate decreased dramatically in comparison to the years before the Euro, with only a slight improvement of the budget. On the contrary, there are relative improvements in the positions of Ireland and Spain. These last results show that: *a*) PIGS are not a homogeneous group of countries because Spain and Ireland clearly stand out from the rest; *b*) indeed, the present day problems of Ireland have quite different roots (the failure of the bank system) than those afflicting Portugal and Greece (government mismanagement of public finances and of the economy in general). For obvious reasons these insights tend to be confirmed on the stock of debt side.

In spite of knowing that this group of countries is not entirely homogeneous, to shed some light on present day state of affairs, we check for possible differences of regime on public expenditures, total revenues and tax revenues between PIGS and the remaining Eurozone member states. The results are in Tables 2 and 3 in Appendix (column III).

Even though expenditures on both groups of countries respond positively to unemployment, the anti-cyclical reaction with respect to that variable is much

stronger among non-PIGS, which we might interpret as an outcome from comparatively weaker public finances as well as a symptom of the PIGS related inability to collect the necessary financial resources. As a matter of fact the standard deviation of the real GDP growth rate among PIGS exceeds that among non-PIGS in about 40%, which is an indicator of more volatility of the tax base. Figure 1 in Appendix also shows that, not only the level of government expenditures is greater among non-PIGS countries as a proportion of GDP, but also more correlated with the unemployment rate.

As mentioned before, whereas the tax rate responds positively to unemployment among non-PIGS, the situation is just the opposite when it comes to PIGS. However, this response is quite small, about -0.05 pp only (we read the reaction of tax revenues to the unemployment rate in PIGS as the sum of the estimated coefficients of $U_{i,t}$ and $U_{i,t} \times PIGS_{i,t}$ (0.61 - 0.66 = - 0.05)). Our hypothesis to explain this finding is again the association of a progressive tax system with the concentration of unemployment in lower income groups, but this time bearing in mind we are dealing with countries with lower per-capita real and nominal incomes where poorer income groups make up a larger share of total population. A final critical difference we might extract from the value of the estimated coefficients for the unemployment rate on expenditures and tax revenues is that, as a whole, stabilization policies are much more effective with non-PIGS than with PIGS. Therefore, the ability of this latter set of countries to control their economic cycles by themselves is rather weak and they mostly depend on the policies undertook by partner countries.

Regarding fiscal rules, when we distinguish between the two sets of countries, deviations of the debt stock from the 60% target do not induce expenditure adjustments, but there is a positive (although small) reaction from tax revenues (Tables 1 and 2 in Appendix – column III). That is, this fiscal rule is slightly obeyed on the taxation side but no effort is made by governments on the expenditure side, which is very much what one feels from empirical observation for the period under consideration. Nonetheless, the significance of the variables (but not their signs) are reversed when we look at the whole sample, since then the adjustment is through expenditures and not through revenues. But then the estimated coefficients are so close to each other and so small on both instances, around something between -0.05 and 0.03 pp, that we would better judge them as inconclusive, *i.e.*, reasonable doubts remain about the existence of any type of adjustment whatsoever to this fiscal rule, as well as to its possible channel; the only conclusion possible is that if any adjustment takes place at all, it is extremely feeble. We find no statistically significant differences of regime among both groups of nations concerning the deviations of the debt stock from the 60% target.

In relation to the deviations of the lagged one period budget surplus from the -3% target, we find no difference of regime between PIGS and non-PIGS.

We come to the conclusion that PIGS, rather than showing more urgency than their more developed and structural stronger partner countries, have chosen instead to mimic the behavior of these rather than reinforcing their efforts.

4. Conclusions

The tests we have performed on the Eurozone countries, duly distinguishing between those that nowadays face seriously unbalanced public accounts and have already received official aid from the Eurozone and the IMF, and those, like Germany, that enjoy a healthy record, reveal the following main results: *a*) the asymmetry of fiscal policies due mainly to the procyclicality of tax revenues and the anticyclicality of government expenditures; *b*) the stronger anti-cyclical reaction of public expenditures among non-PIGS; *c*) the neglect by PIGS and non-PIGS alike of both fiscal rules inscribed in the treaty of Maastricht.

Indeed, in spite of their weaker economies, plagued by structural imbalances making them increasingly uncompetitive and, as a consequence, enjoying comparatively lower and more volatile growth rates of their real GDPs, PIGS chose to replicate the fiscal policies of their more prosperous member partners rather than adjusting in real terms. Faced with the negative external shocks arising from the financial crisis starting in 2007 and from its economic shockwaves, suddenly these countries were forced to confront themselves with the burst of their public debt burden. Before the adoption of the common currency, one of the most widely mentioned threats associated with it was the likely predisposition of individuals and families in the least developed countries of the Eurozone to emulate the economic behavioral patterns of their more affluent counterparts in the most progressive countries of the Union. It seems now that such danger also existed at the government level, openly illustrating the latent conflict between normative and positive public finance.

It is now overtly recognized some important facts about the construction of the Eurozone, mainly: *a*) its intrinsic fragility since it never satisfied the requisites of an optimum currency area; *b*) the overvaluation of some national currencies with respect to the Euro, as is the case of the Portuguese Escudo. Moreover, we could add the emphasis put on nominal convergence, as it is well exposed by the consistent abatement of the unemployment rate volatility after the common currency was introduced, instead of real convergence, among the partner countries based on the underlying assumption of asymmetric shocks instead of government similar behavior patterns. Finally, another conclusion which is potentially important is the fiscal system now in place, considering its ability to function as an effective instrument in pursuance of macroeconomic stabilization purposes and the eventual need for its overhaul accordingly.

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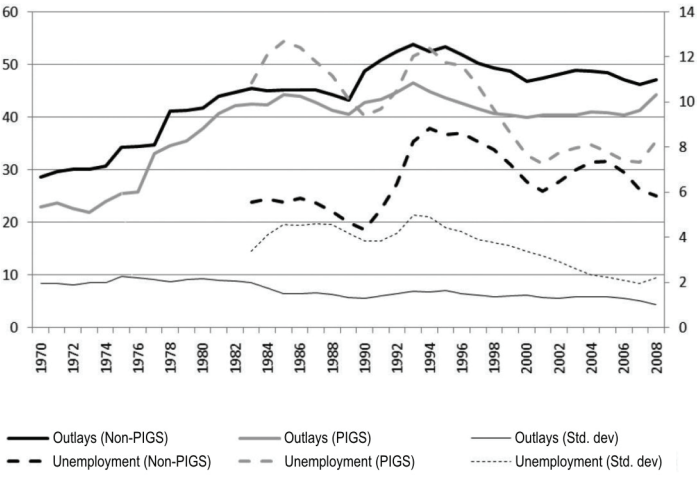
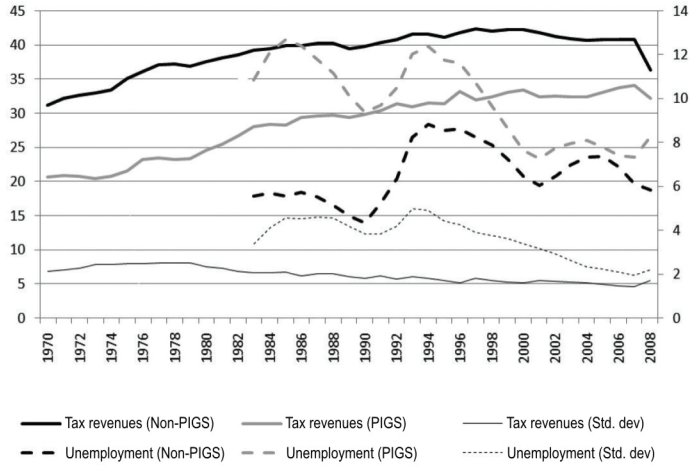
Appendix



Notes: Left axis: Outlays (Non-PIGS), Outlays (PIGS).
Right axis:Unemployment (Non-PIGS), Unemployment (PIGS), Outlays (Std. dev.), Unemployment (Std. dev.).

Source: Comparative Political Data Set and Organisation for Economic Co-operation and Development (OECD) Economic Outlook Statistics and Projections.

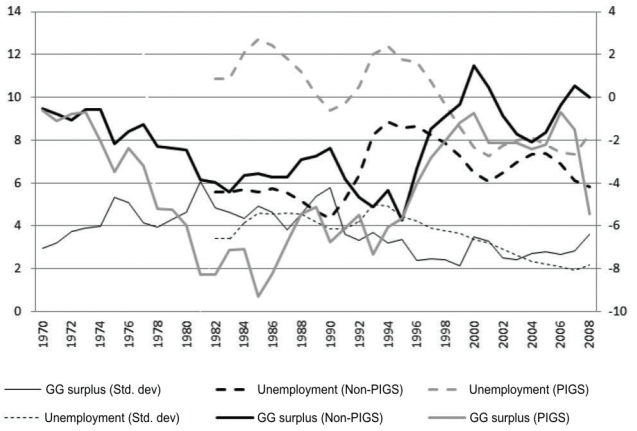
Figure 1 Cyclical Behavior of Outlays



Notes: Left axis: Tax revenues (Non-PIGS), Revenues (PIGS).
Right axis: Unemployment (Non-PIGS), Unemployment (PIGS), Outlays (Std. dev.), Unemployment (Std. dev.).

Source: Comparative Political Data Set and Organisation for Economic Co-operation and Development (OECD) Economic Outlook Statistics and Projections.

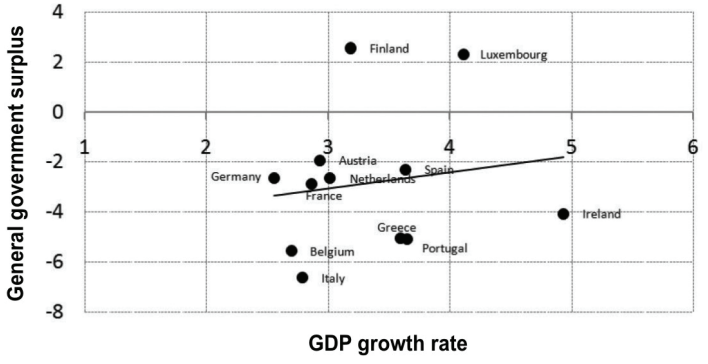
Figure 2 Cyclical Behavior of Tax Revenues



Notes: Left axis: Unemployment (Non-PIGS), Unemployment (PIGS), Outlays (Std. dev.), Unemployment (Std. dev.), GG Surplus (Std. dev.). Right axis: GG Surplus (Non-PIGS), GG Surplus (PIGS).

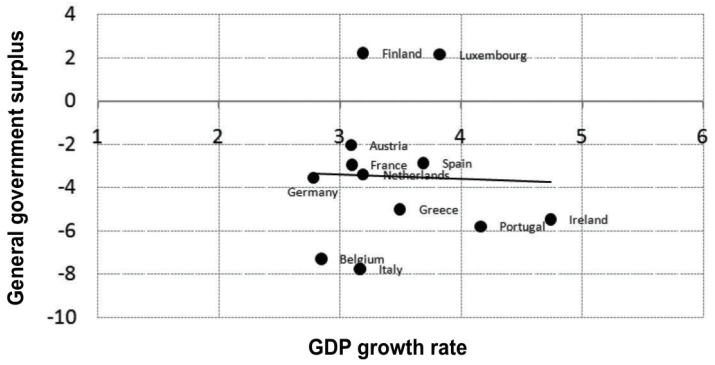
Source: Comparative Political Data Set and Organisation for Economic Co-operation and Development (OECD) Economic Outlook Statistics and Projections.

Figure 3 Cyclical Behavior of General Government Surplus



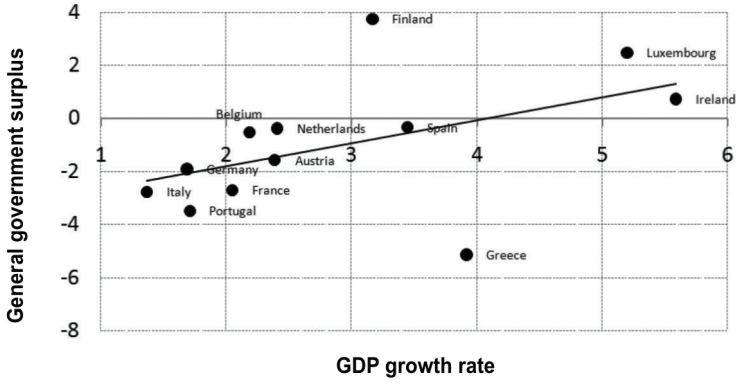
Source: Comparative Political Data Set and Organisation for Economic Co-operation and Development (OECD) Economic Outlook Statistics and Projections.

Figure 4 General Government Surplus vs GDP Growth Rates (Whole Sample Period)



Source: Comparative Political Data Set and Organisation for Economic Co-operation and Development (OECD) Economic Outlook Statistics and Projections.

Figure 5 General Government Surplus vs GDP Growth Rates (Before the Euro)



Source: Comparative Political Data Set and Organisation for Economic Co-operation and Development (OECD) Economic Outlook Statistics and Projections.

Figures 6 General Government Surplus vs GDP Growth Rates (After the Euro)

Table 1 Summary Statistics of the Variables

		A	B	Fi	Fr	G	Gr	Ir	It	L	N	P	S
OUTLAYS i,t	Mean	50.4	52.1	46.7	51.3	46.1	38.3	43.6	46.4	39.6	51.2	41.1	37.2
	Std. dev.	4.5	4.7	8.8	2.7	2.9	8.0	7.5	6.3	1.7	5.2	4.7	7.0
RECEIPTSi,t	Mean	48.1	46.5	49.3	46.8	43.9	32.6	39.3	39.3	41.9	48.6	36.0	34.6
	Std. dev.	3.2	3.1	6.2	3.6	1.6	6.2	3.2	6.5	1.6	3.6	5.7	5.7
$TAX\_REVENUES_{i,t}$	Mean	39.6	41.3	39.9	40.2	25.3	25.7	31.1	34.4	34.7	40.3	26.3	25.8
	Std. dev.	3.4	4.1	5.2	4.0	1.6	5.2	2.8	7.0	4.7	3.3	6.7	7.6
$U_{i,t}$	Mean	4.2	7.7	6.9	9.0	8.3	8.7	10.5	9.1	3.0	5.4	6.4	13.2
	Std. dev.	0.5	2.3	4.0	1.7	1.5	1.7	5.1	1.5	1.0	2.0	1.6	3.7
$DEBT_{i,t}$	Mean	50.8	100.0	34.5	48.3	43.5	60.9	69.2	92.9	8.8	70.5	68.3	57.6
	Std. dev.	19.4	28.1	20.1	17.1	17.3	40.3	25.9	28.0	2.7	13.7	4.2	11.0
$GGS_{i,t}$	Mean	-1.9	-5.6	2.6	-2.9	-2.6	-5.0	-4.1	-6.6	2.3	-2.6	-5.1	-2.3
	Std. dev.	2.0	4.2	3.6	1.4	2.3	4.1	4.7	3.6	2.0	2.3	2.0	2.7
$OPENC_{i,t}$	Mean	71.7	128.3	57.9	42.6	51.0	44.4	114.0	41.7	201.9	107.3	58.2	37.7
	Std. dev.	15.5	25.0	10.4	8.5	13.7	10.0	33.0	8.0	43.6	16.0	9.39	13.3
$UDENSITY_{i,t}$	Mean	49.9	50.9	67.4	14.3	30.7	32.9	53.8	39.1	45.8	29.5	34.0	16.1
	Std. dev.	10.6	4.6	11.4	5.6	4.8	6.0	9.0	6.8	3.2	6.4	16.9	8.3
$ELDERLY_{i,t}$	Mean	15.0	14.9	12.6	14.3	15.6	13.9	11.1	14.7	13.4	12.2	13.7	13.0
	Std. dev.	0.8	1.5	2.5	1.4	2.1	2.6	0.2	3.1	0.7	1.5	2.9	2.8

A-Austria; B-Belgium; Fi-Finland; Fr-France; G-Germany; Gr-Greece; Ir-Ireland; It-Italy; L-Luxembourg; N-Netherlands; P-Portugal; S-Spain

Source: Authors' calculations.

Table 2 Estimation Results – Fiscal Dependent Variable: Outlays

Variables	(I)		(II)		(III)	
	Coef.	t-statistic	Coef.	t-statistic	Coef.	t-statistic
Const	33.17***	4.35	33.98***	4.16	30.10***	5.41
$U_{i,t}$	0.85***	6.79	0.88***	6.14	1.22***	10.47
$U_{i,t}$×$EURO99_{i,t}$	-	-	0.30***	2.95	-	-
$U_{i,t}$×$PIGS_{i,t}$	-	-	-	-	-0.68***	-3.41
$DEBT_{i,t-1}$–60%	-0.05**	-2.26	-0.05**	-2.25	-0.03	-1.33
($DEBT_{i,t-1}$–60%)×$EURO99_{i,t}$	-	-	0.00	-0.08	-	-
($DEBT_{i,t-1}$–60%)×$PIGS_{i,t}$	-	-	-	-	-0.03	-1.03
$GGS_{i,t-1}$–(–3%)	-0.53**	-7.51	-0.55**	-2.35	-0.40***	-5.31
[$GGS_{i,t-1}$–(–3%)]×$EURO99_{i,t}$	-	-	0.32**	2.09	-	-
[$GGS_{i,t-1}$–(–3%)]×$PIGS_{i,t}$	-	-	-	-	-0.07	-0.52
$OPENC_{i,t}$	-0.07**	-2.17	-0.07**	-2.35	-0.09***	-3.09
$UDENSITY_{i,t}$	0.09**	2.04	0.05	1.25	0.15***	3.51
$ELDERLY_{i,t}$	0.85**	2.30	0.85*	2.0	0.95***	3.28
$ELECTIONS_{i,t}$	0.08	-0.21	-0.15	-0.40	-0.11	-0.32
$GOV\_NEW_{i,t}$	0.41	0.96	0.60	1.37	0.37	1.06
$GOV\_PARTY_{i,t}$	-0.11	-1.01	-0.13	-1.28	0.01	0.10
$GOV\_TYPE_{i,t}$	-0.51**	-2.37	-0.55**	-2.74	-0.43**	-2.24
No. obs. / No. Countries	233/12		233/12		233/12	
Time/Country fixed effects	yes/yes		yes/yes		yes/yes	
Adjusted R^2	0.88		0.89		0.90	
DW	0.78		0.80		0.87	
F-statistic	31.74		31.51		36.16	

Notes: ***, **, and * indicate significance at .01, .05, .1 respectively. + t-statistics based on White cross-section consistent standard errors.

Source: Authors' calculations.

Table 3 Estimation Results – Fiscal Dependent Variable: Tax Revenues

Variables	(I)		(II)		(II)	
	Coef.	t-statistic	Coef.	t-statistic	Coef.	t-statistic
Const	28.19***	6.99	31.97***	7.82	26.44***	8.10
$U_{i,t}$	0.27***	3.08	0.25***	2.75	0.61***	7.36
$U_{i,t}$×$EURO99_{i,t}$	-	-	0.26***	4.13	-	-
$U_{i,t}$×$PIGS_{i,t}$	-	-	-	-	-0.66***	-4.23
$DEBT_{i,t-1}$–60%	0.02	1.36	0.02	1.30	0.03**	2.31
($DEBT_{i,t-1}$–60%)×$EURO99_{i,t}$	-	-	0.02**	1.99	-	-
($DEBT_{i,t-1}$–60%)×$PIGS_{i,t}$	-	-	-	-	-0.01	-0.46
$GGS_{i,t-1}$–(–3%)	0.093*	1.77	0.02	0.44	0.20***	3.21
[$GGS_{i,t-1}$–(–3%)]×$EURO99_{i,t}$	-	-	0.34**	2.79	-	-
[$GGS_{i,t-1}$–(–3%)]×$PIGS_{i,t}$	-	-	-	-	-0.03	-0.34
$OPENC_{i,t}$	-0.04**	-2.10	-0.04**	-2.31	-0.06***	-3.73
$UDENSITY_{i,t}$	0.07**	2.16	0.03	1.01	0.11***	3.20
$ELDERLY_{i,t}$	0.69***	3.01	0.48*	1.79	0.73***	3.17
$ELECTIONS_{i,t}$	-0.66**	1.77	-0.68**	-2.19	-0.68***	-2.83
$GOV\_NEW_{i,t}$	0.27	0.76	0.43	1.29	0.23	0.85
$GOV\_PARTY_{i,t}$	-0.08	-0.87	-0.08	-0.91	0.03	0.46
$GOV\_TYPE_{i,t}$	-0.20	-1.60	-0.24	-2.15	-0.16	-1.54
No. obs. / No. Countries	233/12		233/12		233/12	
Time/Country fixed effects	yes/yes		yes/yes		yes/yes	
Adjusted R^2	0.88		0.88		0.90	
DW	0.45		0.54		0.65	
F-statistic	29.94		30.45		36.25	

Notes: ***, **, and * indicate significance at .01, .05, .1 respectively. + t-statistics based on White cross-section consistent standard errors.

Source: Authors' calculations.

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