Fiscal Perspectives in Europe:
Convergence and Debt's Burden

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ABSTRACT

*The paper addresses the question of the fiscal perspectives within the Economic and Monetary Union (*EMU*). By using a panel data analysis associated with an interpretation in terms of differences instead of levels, the results show a steady convergence of public deficits across the *EMU*, and that the *EMU* needs either to comply with the Lisbon agenda, or some kind of a growth strategy, or reduce the interest of the debt in order to regain some fiscal flexibility while abiding by the Stability and Growth Pact (*SGP*).*

Keywords: *Europe, Fiscal policy, Stability and Growth Pact, Error component model*
JEL Classification: E6, F4,H3, H5, H6

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1. Introduction

On March 23, 2005, the European Council agreed in unanimity to introduce some flexibility into the Stability and Growth Pact (SGP), creating in fact a SGP II. This flexibility is introduced via the concept of "relevant factors," which are country-specific. Nevertheless, six years of governance by the Treaty of Maastricht, followed by five years under the rules of the SGP seem adequately to demonstrate the positive externalities created by European fiscal packages on European countries' economies.

However, some countries are breaching, or are close to breaching, the SGP. Using the revised numbers from Eurostat for Greece, the latter was always above the 3 percent deficit ceiling in our sample. Portugal's deficit in 2001 was greater than 3 percent, followed by Germany's and France's from 2002 to 2004, as well as subsequent breaches by Italy, the U.K., and The Netherlands in 2004.

The stake is different for countries belonging to the Economic and Monetary Union (EMU), in light of the necessity for economic policy coordination. During the convergence period from 1993 to late 1998, it appeared that some coordination rules were needed once the first European countries were ready to enter into the EMU. To this end, Germany, in 1995, proposed the Stability Pact in order to extend the positive effects of the convergence period and to prevent countries from contracting their public spending during this period only to increase it later on. First drafted in Madrid in 1995, heavily debated in Florence and Dublin in 1996, and accepted by France the same year, the SGP, now backed by the two largest countries of the forthcoming EMU, was adopted in Amsterdam in 1997.

The SGP consists of extensions of the fiscal package of the Treaty of Maastricht. To comply with the SGP, countries may have a budget deficit within 3 percent of GDP, or public debt lower than 60 percent of GDP, although the latter criterion seems to have a weaker timbre. (The 3 percent rule is less arbitrary than people sometimes believe. With an average nominal growth rate of 5 percent and a targeted inflation rate of 2 percent, the real growth rate of 3 percent would balance the deficit of 3 percent of GDP.)

Formally, the SGP consists of three elements: first is a political commitment by all parties involved in the SGP (Commission, Member States, Council) to the full and timely implementation of the budget surveillance process (European Council 1997).

Second, there are preventive elements (European Council 1997): (1) all Member States implement stability and convergence programs; (2) there exists the possibility of triggering the "early warning" mechanism in the event of a significant slippage in the budgetary position of a Member State. The European Commission then makes recommendations to the Council. This has happened four times: on January 30, 2002, for Portugal and Germany; November 19, 2002, for France; and April 28, 2004, for Italy.

Third, there are dissuasive elements (European Council 1997), which require Member States to take immediate corrective action and, if necessary, allow for the imposition of sanctions. If a country breaches the SGP, it exposes itself to penalties. These penalties are embodied in the SGP through article 104c of the Treaty of Maastricht via compulsory deposits that, after time, can be transformed into fines if governments do not take measures to decrease their deficits. The non-interest-bearing deposits are made up of two elements: a fixed sum equal to 0.2 percent of GDP and a supplement of 0.1 percent of GDP for every percentage point by which the budget deficit exceeds the 3 percent reference level. Derogation is possible for "exceptional and temporary" circumstances, particularly in the case of a negative annual real growth rate. The exemption is automatic for countries if their GDP has declined by at least 2 percent, and if the excess deficit is temporary and small. Those countries in which the GDP has declined between 0.75 percent and 2 percent can also gain exemption from the rule with the consent of the Council. In the new definition of the SGP, "relevant factors" will also be considered. When taking into account "relevant factors" – which are already in the Treaty and which have to be used in a balanced overall assess-

ment – the decision whether an excessive deficit exists will be fully conditional on the overarching principle that – before these factors are taken into account – the excess over the reference value has to be temporary and the deficit has to remain close to the reference value; nor can those relevant factors be invoked to put an end to an excessive deficit procedure. More emphasis will be placed on debt developments and sustainability.

Figure 1. Public deficits as a percentage of GDP
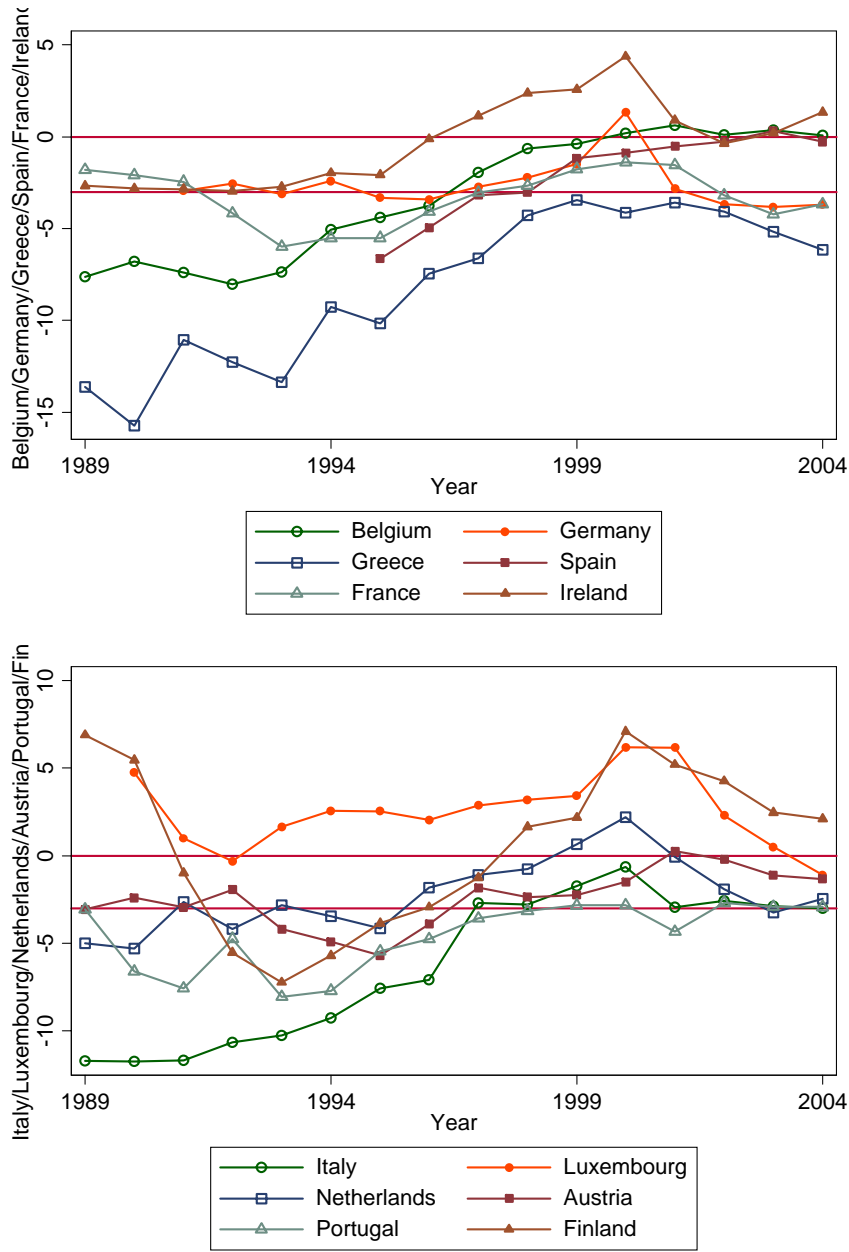
Source: Eurostat, 2005, and own computations

According to revised budget figures, Greece always breached the deficit ceiling in our sample. The stakes are high. The SGP has been justified by the economic literature in many ways, one of them being the impediment of free riding behaviors that could hamper the stability of the euro zone.

The paper addresses the question of what the forces are which pushed some countries to breach the SGP. Is free-riding a conceivable source or is the breaching rooted a little more in the structure of national budgets?

The structure of the paper is as follows. Section 2 presents arguments both supporting the Pact and recommending alternatives. Section 3 discusses some of these arguments. Section 4 presents the model, and section 5 the results. The policy implications are drawn in section 6.

2. The rationale of the Stability and Growth Pact

Firstly, several researchers deal with the question of the sustainability of the budget deficit (Bohn 1995, Mongelli 1999, Nielsen 1992, Perotti, *et al*. 1998), the bottom line of which, is preventing idle governments from hampering European growth. Amador (1999) emphasized both the role of fiscal policy, and the behavior of the budget deficit and the public debt over time; an important feature of this model was the defining of sources of uncertainty as "stochastic processes." On Figure 2, it is interesting to notice that deficit as a percentage of GDP excluding the debt interest is close to zero or even positive (a surplus) for almost all the euro area members. What pushes countries like France, Germany, and Greece below the 3 percent deficit ceiling is the debt interest.

Figure 2. Deficit excluding interest as a percentage of GDP

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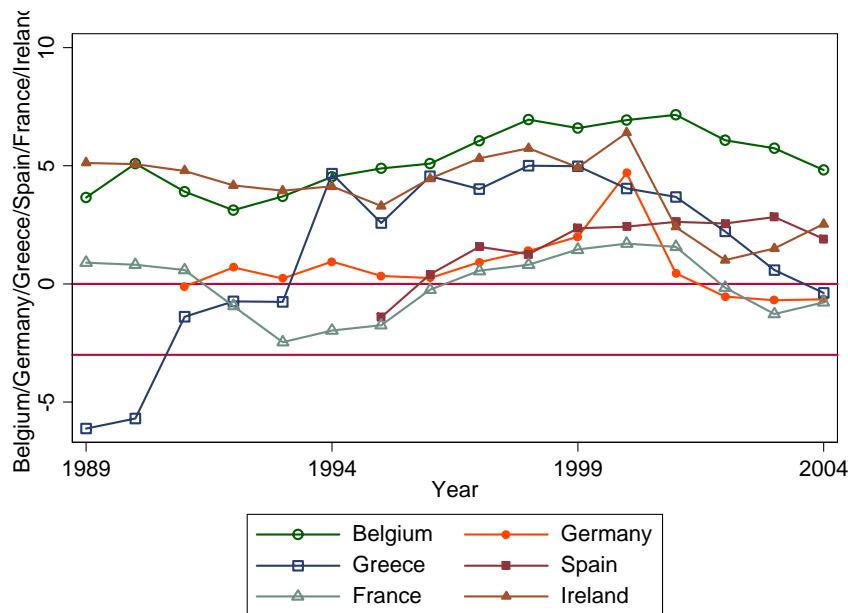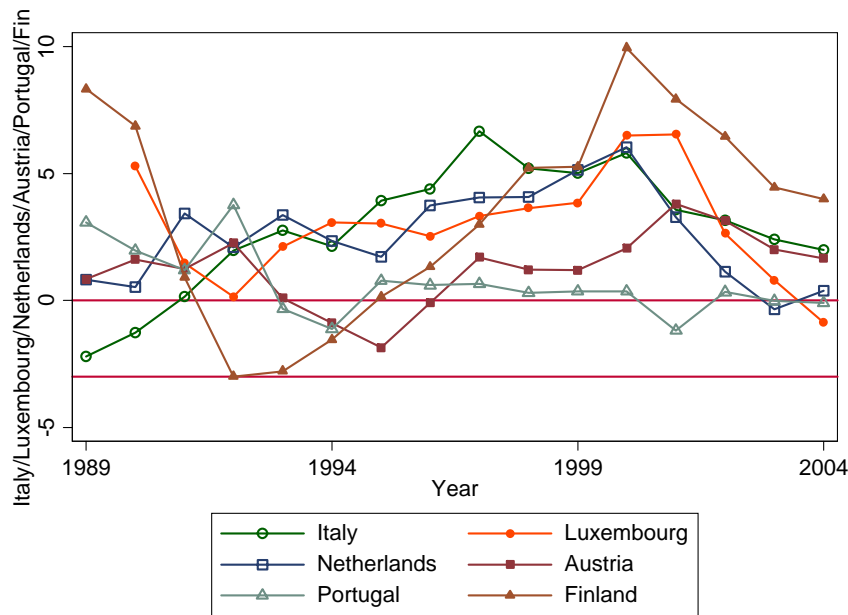
Source: Eurostat, 2005, and own computations

Secondly, Beetsma (2001) develops a policy-mix argument, with other supporters of the SGP asserting that the advent of a central monetary authority was important in establishing the correct mix of fiscal and monetary policy in the Euro-zone (Issing 2002).

Thirdly, and slightly different, is the question of fiscal coordination among member countries. Here, the issue is not coordinating monetary policy with a country-specific fiscal policy, but rather coordinating fiscal policies collectively. A lack of coordination could lead to asymmetric economic shocks on both the aggregate demand and aggregate supply in every country, as well as hindering the European convergence. However, coordination is not synonymous with convergence (Krugman 1993).

Fourth is the matter of free-riding. Uhlig (2002) focused his discussion of free-riding and the SGP on the effects of centralized monetary policy combined with decentralized fiscal policy. Uhlig regards the SGP as essential in preventing free-riding in the form of excessively high deficits. The cause for concern over debt levels hinges on the independence of the central bank, because excessive levels of debt might lead to a crisis in which the ECB might be morally, although not legally, bound to bail out insolvent countries. This defense of the SGP is not, however, without its opponents; a large share of the literature dissects the relationship between centralized monetary and decentralized fiscal policymakers, and finds that the SGP might not be needed under some conditions (Fourçans and Warin 2000, Leith and Wren-Lewis 2002, Vranceanu and Warin 2001).

The fifth issue is moral hazard, which differs from free-riding to the extent that it is "post-contractual opportunism." In other words, once the pact is signed, countries' loss functions change. Dixit (2001), and Dixit and Lambertini (2001) demonstrate that fiscal discretion leads to equilibrium levels of output and inflation far different than Pareto-optimal choices.

The sixth consideration is structural externalities. In order to abide by the fiscal rules of the SGP, countries are forced to make needed structural reforms (Warin 2005). These changes occur in the form of how much and how governments raise taxes, and how much and how they allocate public expenditures.

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A seventh reason is the maintenance of the credibility of the European central bank through insuring its leadership as the monetary authority. As noted by Buti and Van den Noord (2004), the EMU is, "[commonly] seen as a regime of monetary leadership where fiscal policy is to support the central bank in its task to keep inflation in check." This power is drawn from the following European Council resolution which accompanies the Pact: "[it] is also necessary to ensure that national budgetary policies support stability oriented monetary policies." When the Maastricht Treaty was drafted, many observers believed that the European budgetary situation could undermine the credibility of the future European Central Bank (Beetsma and Bovenberg 1995). If a country's fiscal situation becomes unsustainable, other countries might be forced to bail out the insolvent national government. Alternatively, the European Central Bank may be forced to monetize national debts, and in so doing, create additional inflation in the EU. Bolt (1999) summarizes this argument stating that, "It is in [the following] context that the Pact for Stability and Growth must be regarded: it seeks to supplement the common monetary policy framework within EMU with sound fiscal policies by the Member States so as to relieve the burden on the ECB's monetary policy and to leave room for the operation of the automatic stabilizers."[1]. Cooper and Kempf (2000), nonetheless, call for some flexibility at the fiscal level, as the central bank lacks the tools necessary for stabilization in the presence of country specific shocks.

In retrospect, the SGP does not seem to provide an effective answer to the seven branches of the literature studying the potential need for a fiscal rule. This is not surprising, since the SGP is more a politically designed rule – for good reasons: extending the Treaty of Maastricht – than an economically designed rule.

3. Some reasons why the SGP faces difficulties

The question of free-riding is at the forefront of this issue. German and French advocacy of fiscal restraints, as well as their prominence relative to other European economies, makes it hard to believe that they intended to benefit from the others by running high deficits (Warin and Wolff 2005).

Secondly, we must consider that the issue is not free-riding but rather a lack of political incentives, as noticed by Buti and Van den Noord (2004). Maastricht was tough on countries; any breach of the deficit rule precluded their entrance. Yet, once a member of the EMU, a country understands that the letter of the SGP's law is far looser than its spirit, and that some room for maneuvering exists. Why does this interpretation exist? In contrast to Buti and Giudice (2002), we are not going to look for different political incentives within countries, but rather take a look at the intent of the SGP. In spirit, the SGP is tough on countries, having very fixed criteria for compliance. Yet, the application is more difficult than the criteria, and the dynamics of the pact generate unforeseen effects. Because the SGP is calculated over GDP and countries cannot know the precise level of future gross domestic products, it is almost impossible for countries to target a deficit of 3 percent GDP. Consequently, the SGP is an *ex post facto* rule.

This characteristic makes it rather difficult, if not impossible, for a country to abide by the rule without knowing precisely what its end-of-year GDP will be.[2] When a country decides its spending, it approximates its revenue by considering a forecast of the GDP growth rate. Hence, if for any reason the actual GDP is lower than the forecasted GDP,[3] the country may breach the pact. While it might be argued in defense of the pact that a country should choose a minimum margin approach instead of a truly optimistic one, political considerations make this improbable. Given the impact of economic language on people's confidence, a policymaker may continue to forecast a higher GDP growth rate, and consider an actual deficit cap lower than the 3 percent rule. Politicians, however, for whom the life cycle is very short, may

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[1] Bolt (1999), p. 1.
[2] For instance, France in 2002 breached the SGP with a deficit of 3.1 percent of GDP.
[3] See Jonung and Larch (2004)

consider the vagueness of such an approach a loophole. This intrinsic *ex post facto* feature of the SGP is one important reason why the political incentive to abide by the pact is reduced.

4. Data and methodology

The choice of the econometric model is between a fixed effects model and a random effects model. After having run a Hausman specification test, it appears that the random effects model is preferable. This is not surprising since our data set is not large, and the fixed effect model may have too many cross-sectional units of observation requiring too many dummy variables for its specification. This may sap the model of sufficient number degrees of freedom for adequately powerful statistical tests.

Due to missing values for some countries, the panel is unbalanced. A way to check for autocorrelation is to use Baltagi and Wu's (1999) test: a Durbin-Watson like test to handle unbalanced and equally spaced data. If there is autocorrelation, the option would be fourfold: (1) a dynamic panel model (two-way random effect model or error-component model) with first differences, sometimes known as a Prais-Winston transformation or a Cochrane-Orcutt transformation; (2) a dynamic model with lagged dependent variables with two slightly different approaches known as one or two step general methods of moments (GMM) estimators as in Arellano and Bond (1991) or Arellano and Bover (1995);[4] (3) a weight-adjusted combination of the White and Newey-West estimator to handle both the heteroscedasticity and the autocorrelation in the model; or (4) a feasible generalized least squares procedure (FGLS, or a two-state generalized least squares model) as in Parks (1967) and Kmenta (1997) in which the model assumes an autoregressive error structure of the first order (AR(1)) along with contemporaneous correlation among cross-sections.

A fifth alternative is the one proposed here. The model can be based on pairs of countries with pair data representing the differences between each regressor. This has the benefit of generating more data than the original data set (twelve countries in the original sample lead to sixty-six pairs), authorizing the use of a FGLS approach as in Parks (1967) and Kmenta (1997), which will deal with heteroscedasticity as well as autocorrelation as in a GMM approach, without the inconvenient of not having the most efficient estimators as it may happen in a GMM model (due to the calculation of the moments).

The pair-based analysis, by generating more information than the original sample, will allow us to cut the dataset into two periods: before and after 1999, date of the inception of the euro. This may not correspond to a "statistically measured" structural break, but it corresponds to a "political" structural break. This makes sense since we deal with data (deficits, debts, etc.) that are constrained by public policies (SGP), and not the other way around.

The methodology is inspired by a previous work by Warin and Wolff (2005) on fiscal deficits in Europe, where the authors used a pair based analysis between five cross-sectional units: four being France, Germany, Spain, and Italy, and the last entity being a weighted average of the eight other euro area members. In this study, there are many differences: (1) the dataset is broader, since we compute country pairs among the twelve members of the euro area: Austria, Belgium, Finland, Germany, Greece, Ireland, Italy, France, Luxembourg, The Netherlands, Portugal, and Spain. We have sixty-six pairs, and 1,056 observations. And the time span is larger: the data start in 1989, and end in 2004, and we compare the period before the inception of the euro in 1999 to the period after 1999. (2) We consider different independent variables. (3) We still draw a cross-sectional time-series analysis, and our pool is still "temporal dominant" following Stimson's (1985) definition, but unlike the previous study, the coefficient of the AR(1) process is specific to each panel.

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[4] GMM is usually robust to deviations of the underlying data generation process to violations of heteroscedasticity and normality, insofar as they are asymptotically normal, but they are not always the most efficient estimators.

There are also similarities with the previous study: (1) we want to study one country's behavior in reaction to another one's behavior, hence we keep the difference-based analysis; (2) the database is constituted of data from the *AMECO* database (European Commission); (3) the model is a closed-economy model; we do not consider open-economy variables; (4) we use the error component model: dealing with large economies, the reasoning being that the relevant explanatory variables that we have omitted are random variables across cross-section or over time.[5]

We analyze the difference in deficits both before and after the inception of the euro. The model is estimated using the following equation:

$$\Delta def_t = \left(\alpha_0 + \lambda_t \right) + \alpha_1 \Delta \overset{-}{tcex}_t + \alpha_2 \Delta \overset{-}{gdp}_t + \alpha_3 \Delta \overset{+}{debt}_t$$
$$+ \alpha_4 \Delta \overset{-}{cpi}_t + \alpha_5 \Delta \overset{+}{i}_{lr,t} + \alpha_6 \Delta \overset{-}{socex}_t + \alpha_7 \Delta \overset{+}{idebt}_t + \varepsilon_t \qquad (1)$$

With intercept $\alpha_{0it} = \alpha_0 + \lambda_t$. Where α_0 is the "mean intercept," and λ_t represents time effects. Expected signs are given above the respective coefficients.

Regarding the problem of estimating parameters α of the FGLS regression model, we can write the following expression:

$$\left(x'\Omega^{-1}x \right)^{-1} x'\Omega^{-1}y \qquad (2)$$

where x represents the independent variables, y represents the dependent variable, and Ω represents the variance-covariance matrix. This estimation is based on the assumption that the variance-covariance matrix is unknown, since we assume that those relevant explanatory variables that we have omitted are random variables. Consequently, we need to find a consistent estimate of Ω, say $\hat{\Omega}$, to substitute $\hat{\Omega}$ for Ω in the formula to get a coefficient estimator α (Kmenta 1997). Thus, we denote the FGLS estimates of α by $\hat{\alpha}$.

Let us now consider the problem of error complications. The Parks-Kmenta method proposes a model for serial correlation (AR(1): first-order autoregressive model):

$$\varepsilon_{it} = \rho_i \varepsilon_{it-1} + v_{it} \qquad (3)$$

where ρ_i is a coefficient of first-order auto-regressiveness. In this model, we allow the parameter ρ_i to vary from one cross-section unit to another. In other words, the coefficient of the AR(1) process is specific to each panel.

Public deficit excluding interest in percentage of GDP will be our dependent variable, denoted def.[6] We calculate differences for country pairs for three groups of variables: (1) monetary variables, (2) fiscal variables, and (3) proxies for the measure of the performance of economies: the gross domestic product at current market prices (GDP, reference level for excessive deficit procedure), as well as the real long-term interest rates (i_{lt}) as in the Treaty of Maastricht.

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[5] In a cross-sectional time-series analysis, error complication can be caused by model misspecifications. To deal with this problem, we can use either the covariance model or the error component model. After testing for each, we noticed that the nature of the dataset was better responding to the error component model.

[6] We consider the actual public deficit excluding interest since we will test the long-term interest rates as an independent variable. We also want to capture the impact of the change in interest rates on the structure of the budget. By looking at the public deficit excluding interest payments, we try to make sure that we don't capture the interest payments.

In the transition phase to an integrated Europe, one can expect tightening of both the monetary and fiscal policies to create – at least during the transition – diverging national GDP growth rates. Indeed, national economic structures will have to adapt during the short-run to these new public policies. In this analysis, size may matter: a large economy may have more difficulties in reforming its structure. This is why we control for differences in GDPs (the sign of the coefficient should be negative).[7] In the long run, countries should converge, and we would like to capture this idea by considering the long-term interest rate (the expected sign is positive).

Monetary variable

We control for the percentage change in the harmonised consumer price index (cpi). In the Economic and monetary union, the European Central Bank (ECB) will tighten monetary policy for all countries; differences in the harmonized consumer price index should decrease. This tightening of monetary policy should lead to an automatic stabilization from the fiscal side leading to a relaxing of the fiscal policy, although it has to be in the margin of the SGP. The expected sign is thus negative, and the value of the coefficient should be even higher after the inception of the euro.

Fiscal variables

We consider the consolidated gross debt (excessive deficit procedure, denoted $debt$) as a percentage of GDP.[8] The sign of the coefficient is country-specific here as countries have to be below 60 percent of GDP but some countries already below this cap may face a rise in their debt, when for others the converse is true.

We control the three main components of the budget: (1) the social benefits other than social transfers in kind as a percentage of GDP, denoted $socex$; (2) the interest of the debt, denoted $idebt$ as a percentage of GDP; (3) the total current expenditure (excessive deficit procedure, denoted $tcex$) as a percentage of GDP.

If GDP s vary across countries due to structural adjustments during the transition phase, social expenditure should also vary due to automatic stabilizers (the sign of the coefficient is negative). This phenomenon could also be accompanied by the total current expenditure as a way for the national governments to absorb the shocks created by the transition (the sign is negative). In terms of the interest of the debt as percentage of GDP, the intuition is that with a central monetary authority interest rates will converge, risk premiums will decrease, and the burden of the debt as a percentage of GDP should converge a little more (the sign is positive).

5. Results

Explanations of the differences in public deficits (excluding interest) for our panel are different if we consider both periods, before and after 1999 (see Table 1). It is first evidence that 1999 is a key date for public deficits in EMU.[9] We can also note that size matters: GDP is significant before and after the inception of the euro likely showing hysteresis effects.

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[7] We performed a Hausman test to check for endogeneity as GDP is an independent variable. The test did not show any endogeneity, which is not surprising as we take differences in GDP. This is one more reason to consider this augmented Kmenta approach based on differences, and not use a GMM model.

[8] The breakdown of total tax burden in capital tax, corporate income tax, and labour tax does not provide us with better results.

[9] Although the 1999 break is statistically significant, it would be interesting in further research to run a Chow test to see whether there was any other year that would be a structural break.

Table 1. Results before and after 1999 [Double-Lin specification]

Dependent variable: Public deficit excluding interest. Mean: 2.294336, Std. Dev.: 20.16424

| Variable	Mean	Std. Dev.	Coefficient	t-statistic
Before euro (1991-1998)				
Interest rate (long-term)	0.0621749	2.162413	-0.023588	-0.44
Total current expenditure	-0.0007352	8.072981	0.0228182	0.46
Public debt	17.39324	44.248	0.0200517	1.86
CPI	0.051232	2.108262	-0.1588413	-1.78*
GDP	287.3024	767.8647	-0.0011036	-5.97***
Social expenditure	0.0935593	4.400035	-0.2110386	-2.67***
Interest of the debt	1.368036	4.010693	0.1429264	1.19
Intercept			0.0564233	0.31
n	331			
After euro (>1998)				
Interest rate (long-term)	0.0621749	2.162413	0.034178	0.42
Total current expenditure	-0.0007352	8.072981	-0.0713944	-1.87*
Public debt	17.39324	44.248	-0.0195314	-1.21
CPI	0.051232	2.108262	-0.2828386	-2.91***
GDP	287.3024	767.8647	-0.0011606	-5.60***
Social expenditure	0.0935593	4.400035	-0.0259632	-0.41
Interest of the debt	1.368036	4.010693	0.5518205	2.20**
Intercept			0.3610305	1.87
n	396			

** *.01 significance level

** .05 significance level

* .1 significance level

A second observation, as shown by the fitted curve of the trend of the public deficit differences (see Figure 3), there is no statistical difference in public deficit changes across time. However, we can notice a broader dispersion before 1992, a tightening afterwards until 1999, and a new larger dispersion in 2000 and 2001.

Third, the harmonised consumer price index is only significant in a 10 percent confidence interval, and is negative. This is as expected. What is more interesting is that it becomes significant at 1 percent after the inception of the euro, with an augmentation of the coefficient value, and a negative sign. This is consistent with the larger dispersion in 2000 and 2001 of the differences in public deficits (Figure 3).

Figure 3. Differences in public deficits from 1989 to 2004
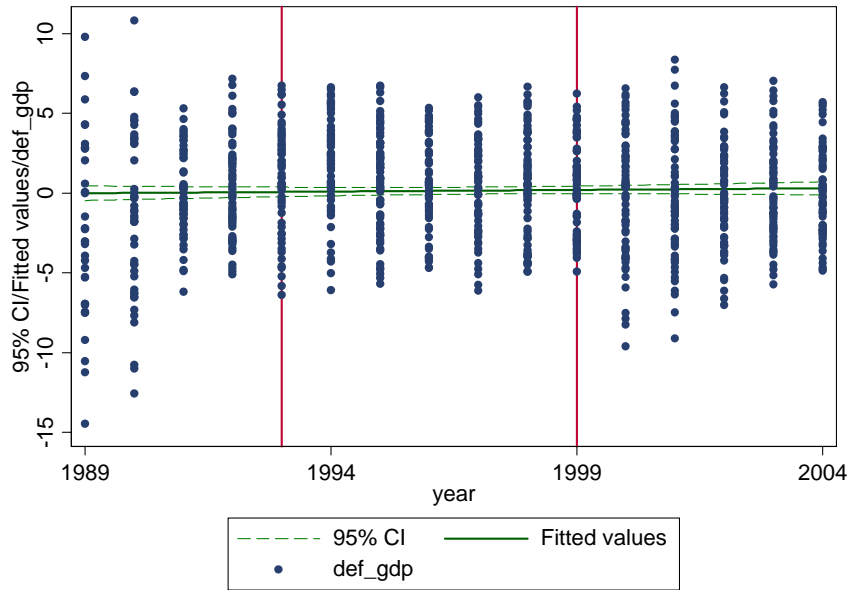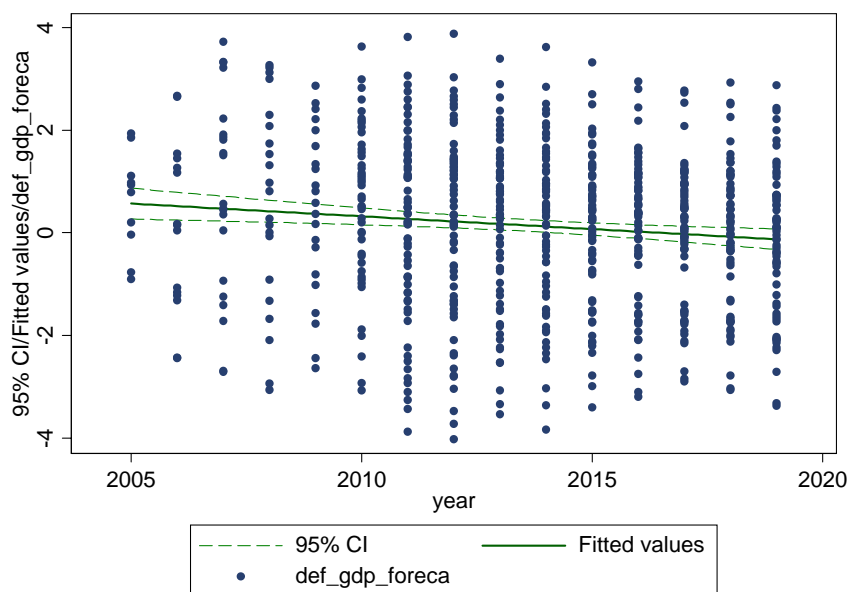

Source: own computations

Fourth, the public spending may be divided into three big categories: (1) social expenditure, (2) total current expenditure, and (3) the interest of the debt. Differences in social expenditure as a percentage of GDP were significant before the inception of the euro, and stopped to be from 1999 onwards. The sign was negative, showing that when social expenditure was increasing through all the countries, it increased deficits everywhere, reducing the differences. With the SGP, the year 1999 represents apparently a turning point: differences in social expenditure are no longer a statistically significant explanatory variable of differences in deficits. However, in terms of public spending, the differences in total current expenditure have become significant at 10 percent after 1999. Also, it is noticeable that the differences in the interest of the debt were not significant before 1999, but have become significant at 5 percent from 1999 onwards with a positive sign for the coefficient showing that a reduction in differences in the interest of the debt explains a reduction in differences in public deficits. In other words, not only has the interest on the debt become a relevant explanatory variable, but it has also become a relevant variable to explain the convergence of the public deficits across the EMU.

6. Forecast and conclusion

We can forecast the trend for the next fifteen years. In order to do so, we set up the initial conditions for the independent variables as having the same trend as for the period 1989-2004. The weights considered for each independent variable are the ones previously calculated for the whole period 1989-2004, conversely to the panel data illustrated in Table 1. Although the dispersion is likely to be higher from 2011 to 2014, we see that the trend or convergence in terms of public deficits is reinforced (see Figure 4).[10]

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[10] Obviously, as the initial conditions will change in the future, the deficit is likely to be different. Nevertheless, the forecast is still useful to see what would happen if nothing is done by the policymakers to change the initial conditions.

Figure 4. Forecast of differences in public deficits (excluding interest)

Source: own computations

This does not mean that public deficits will decrease, but rather that the differences will lessen.

One of the reasons seems to be the interest on the debt. This means that the breaching of the SGP is rooted in a long-term pattern more than in a lack of short-term political will, or in a free-riding behavior in order to benefit from the other euro-members' discipline.

The main issue of this fiscal trend is that deficits higher than the 3 percent ceiling might lead to unsustainable government finances, unless the European real growth rate is higher than 3 percent. With a real growth rate of 1.6 percent in 2001, 0.9 percent in 2002, 0.5 percent in 2003 (European Central Bank 2005), it seems that the EMU needs either to comply with the Lisbon agenda in terms of growth strategy, or reduce the interest of the debt in order to regain some fiscal flexibility while abiding by the SGP.

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