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Abstract

One of the often discussed negative aspects of the Stability and Growth Pact is the rigidity of its deficit rule. Several reform proposals aim currently at alleviating the rule in order to allow the automatic stabilizers to operate freely. However, such a reform is likely to cause even further deterioration of fiscal balances in the member countries. The empirical evidence presented in this paper shows that, in the past, increasing the structural deficit had a strong negative impact on a degree of anti-cyclical fiscal stabilization. This suggests that the reform of the Pact, through higher structural deficits, can decrease rather then increase the scope of anti-cyclical fiscal actions in the EMU member countries.

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Introduction

Problems with the Stability and Growth Pact (SGP) have become probably the most visible and intense issue in the European economic debate within the recent years (see, for example Brunila et al. (2001) or Begg et al. (2004)). The Pact has been criticized from many different perspectives and some reform proposals have been developed (for a thorough review and critique of different reform proposals see Buti et al. (2003)). The Pact is widely criticized for insufficient flexibility in response to economic fluctuations, working asymmetrically around the cycle as well as discouraging public investment. Recently, another line of criticism has gained importance after the European Commission failed to launch the Excessive Deficit Procedure against Germany, France and Portugal, when the deficits in these countries repeatedly exceeded the 3% of GDP limit. It is stressed that the SGP in the current shape has become unenforceable and, as such, it can no longer be viewed as a mechanism for fiscal policy coordination in the Eurozone.

In response to these shortcomings, several reforms have been suggested by both the Commission itself (European Commission (2003), (2005)) as well as by numerous other authors. The reform proposals include changing the technical design of the rules (moving to an expenditure or debt targets, as well as introducing the golden rule – see Mills and Quinet (2001), Brunila (2002), Buiter and Grafe (2002)), new measures to strengthen discipline of the financial markets, introducing tradable deficit permits (see Casella (2001)), or procedural reforms that include replacing the current framework with the politically independent Fiscal Policy Committees (see Wyplosz (2002), von Hagen (2002), Fatás et al. (2003)).

Throughout the discussion one of the ideas, suggesting that the Pact should be made more flexible (sometimes also labelled as "more intelligent"), remains relatively popular (see European Commission (2004), (2005), Annet et al. (2005)). It seems to have played an important role in the process of softening the Pact, undertaken in spring 2005, which considerably broadened the scope of "exceptional circumstances" that prevent the Excessive Deficit Procedure from being

launched against a country breaking the EMU fiscal rules. The concept bases on a conventional wisdom that a rigid deficit rule prevents high deficits during a recession, thus hindering anti-cyclical policy. According to this rationale, alleviating the hard 3% deficit constraint is hence a direct way to more cyclical stabilization as well as tax-smoothing, thus bringing significant gains in welfare.

One possible objection to this line of reasoning bases on the observation that if budget is close to balance in structural terms, then under normal conditions there is room for manoeuvre to accommodate even quite severe recessions.[2] Another one, developed in this paper, centres around the incorrectness of some *ceteris paribus* assumptions implicitly incorporated in the suggestion of loosening the hard deficit ceiling.

First, it should be noted that in the presence of politically-motivated deficit pressure the Pact's "close to balance or in surplus" clause appears not to be actually binding, as most of the Euro member countries have demonstrated in the past significant structural deficits. Table 1 in the Appendix A shows that in years 1999-2003 the rule has been in most cases broken. As Schuknecht (2004) points out, the most severe problems were the methodological complexities and the lack of penalty for possible non-compliance, which resulted in almost complete unenforceability of the Pact's fundamental component.

As a result of these problems, the hard 3% deficit ceiling became the core rule of the SGP framework. Even taking into account the fact that launching the Excessive Deficit Procedure against Germany and France turned out to be politically impossible, breaking the deficit

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[2] The typical example used in the literature (see, for example Canzoneri and Diba (2001)) shows that 1 percentage point decline in GDP is accompanied by deficit increase of ca 0.5% of GDP, so, under structurally balanced budget, the Stability and Growth Pact allows to accommodate negative output gaps as large as 6% of potential GDP. More refined calculation, yielding essentially the same conclusions, are presented by Dalsgaard, de Serres (2001) and Barrell, Dury (2001).

constraint by a country is still a major problem and makes the country being perceived as fiscally irresponsible. It can thus be expected that possible elimination of the widely criticized "3%" rule yields, in addition to some potential room for the anti-cyclical policy, the further deterioration of public finance in at least some of the Eurozone countries. It is argued in this paper that such a change is likely to trigger mechanisms that make the fiscal policy actually more pro- rather than anti-cyclical.

The existing literature (Kaminsky et al. (2004), Talvi and Vegh (2005)) shows that pro-cyclicality of fiscal deficits is a phenomenon observed in many countries, that strongly contradicts the traditional normative theories concerning the use of fiscal policy in the business cycle – both the Keynesian demand-side and Barro's (1979) "tax smoothing" theory. The relatively simplest explanation of this regularity is offered by Gavin et al. (1996), Perry (2003) and Kaminski et al. (2004). They suggest that if the country's underlying fiscal position is weak, the government may not be able to increase the actual deficit during the recessions because of an external pressure that comes from at least two sources. One of them are the financial markets that become increasingly concerned when the deficit-to-GDP ratio is growing and tend to react via increasing the risk premiums, thus influencing the alternative cost of increasing present expenditure. The other problem is the political pressure, as a government pursuing high-deficit policy tends to be viewed as economically irresponsible. A consequence can be an actual inability to conduct the proper anti-cyclical fiscal policy and to increase deficits during the economic downturns.

A different theoretical explanation is provided by Alesina and Tabellini (2005), who argue that under extremely low fiscal transparency it is optimal for the voters to demand particularly high provision of public goods during the economic upturns. According to an alternative politico-economic explanation offered by Talvi and Vegh (2005) (and, similarly, Lane (2003)), the governments that face particularly high variability of the tax base may choose to run pro-cyclical fiscal policy, because it allows them to counter the pressure to increase public spending.

The two latter theories stress the fact that the fiscal policy tends to be pro-cyclical above all in the developing countries that are characterized by particularly low transparency and high macroeconomic volatility. However, the empirical evidence presented in this paper suggests that pro-cyclicality characterizes also the fiscal policy in many developed European countries. Hence, the first explanation is preferred here, because it is the only one that can explain why some degree of pro-cyclicality may be observed in the developed EU countries. According to this hypothesis, a weak fiscal position in structural terms results, through worse credit ratings, in higher cost of debt financing, thus making the loosening of fiscal policy particularly difficult during the recessions.

The analysis presented in this paper shows that, indeed, the EU countries with higher structural surplus tend to render stronger anti-cyclical fiscal reactions to the business cycle fluctuations. The panel analysis based on the sample of 12 European countries in years 1980-1996 shows that, while the output elasticity of fiscal surplus (in details defined later in the text) equals ca. 1 under the structurally balanced budget, it is reduced by around 40% if the structural deficit increases to 5% of GDP. This result is then related to the ongoing discussion concerning the reform of the Stability and Growth Pact. It is argued that softening the existing framework is likely to cause larger structural deficits, which, in line with the presented empirical evidence, may result in more pro-cyclical fiscal policy. These results suggest that great caution is needed when alleviating the existing deficit limit, as such a change may not yield desirable gains in terms of ability to conduct proper anti-cyclical fiscal policy.

The presented analysis is novel in three main ways. Firstly, it empirically investigates the influence of structural surplus on the measure of fiscal cyclicality. Secondly, it does so in a one-step procedure that allows to estimate directly the size of the measured relationship. It has been used instead of the two-step procedure typically employed in other analyses (for example in Lane (2003) or Fatas and Mihov (2004)), because the latter is likely to produces biased estimates of the parameters of interest (see Canova and Pappa (2005) for a discussion of this problem). Finally,

the analysis offers another argument in the discussion concerning the future of the Stability and Growth Pact. While it does not provide a definite case in favour of keeping or removing the Pact, it clearly suggests that its partial reforms through softening the deficit rule are likely to be counter-productive.

Model specification

In line with the mainstream literature concerning the fiscal cyclicality, it is assumed here that both expenditure and revenue of the state are a function of the output gap (see, for example, Lane (2003) or Talvi and Vegh (2005)). The equations explaining the key fiscal variables – general government real expenditure E and revenue R (for the country i at year t) are assumed to be:

$$(1) \qquad E_{it} = \overline{E}_{it}(\tilde{y}_{it})^{\varepsilon_G} \qquad\qquad R_{it} = \overline{R}_{it}(\tilde{y}_{it})^{\varepsilon_R},$$

where $\overline{E}$ and $\overline{R}$ denote, respectively, the structural levels of expenditure and revenue and $\tilde{y}_{it}$ is the output gap, defined as the ratio of actual to potential GDP. ε_E and ε_R are elasticities of expenditure and revenue with respect to output gap (short-term output elasticities). If $e = E/Y$, $r = R/Y$ (and, respectively $\bar{e} = \overline{E}/\overline{Y}$, $\bar{r} = \overline{R}/\overline{Y}$) then the above equations can be re-written as:

$$(2) \qquad e_{it} = \bar{e}_{it}(\tilde{y}_{it})^{\varepsilon_E - 1} \qquad\qquad r_{it} = \bar{r}_{it}(\tilde{y}_{it})^{\varepsilon_R - 1}.$$

Let us define the general government surplus as the *ratio* of revenue to expenditure. Such a definition has two advantages over the conventional one, where the measure of fiscal position is the ratio of difference of revenue and expenditure to GDP. The first and the less important advantage is the convenience and consistency of notation. More importantly, such a formulation allows to directly control for the impact of size of the public sector on automatic stabilizers. Countries with larger public sector (expressed as a high ratio of fiscal revenue and expenditure to GDP) tend to have stronger automatic stabilizers as a ratio to GDP. This is because in these countries the same relative fluctuations of GDP around its potential level will produce, assuming the same output elasticity of revenue and expenditure, larger fluctuations of fiscal surplus when expressed as per cent of GDP, than in countries with smaller public sector. The definition used

here bases directly on elasticities (instead of semi-elasticities typically used in the literature), which eliminates the described problem and allows to compare elasticities directly between countries, independently on the differences in the size of their public sectors. The similar approach was adopted previously by Tellier and Imbeau (2004), while these authors used the ratio of surplus to total spending, instead of ratio of revenue to total spending used here.

These definitions, together with (2), allow to formulate the following equation of fiscal surplus:

$$\log(r_{it} / e_{it}) = \log(\bar{r}_{it} / \bar{e}_{it}) + (\varepsilon_R - \varepsilon_E)\log(\tilde{y}_{it}) . \quad (3)$$

Expression $(\varepsilon_R - \varepsilon_E)$ above is the measure of cyclical elasticity[3] of the fiscal surplus and is later in the text denoted by ε_S. Equation (3) can be interpreted as a disaggregation of actual surplus into two components: the "structural" surplus, statistically uncorrelated with the business cycle (incorporating also the random component, to be defined later) and the "cyclical" component, incorporating the total impact of the business cycle. What is important, the $\bar{r}_{it}$ and $\bar{e}_{it}$ above are not necessarily equal to the conventional measures of structural expenditure and revenue computed according to the standard "gap-plus-elasticity" methodologies. This is due to the fact that the latter include only technical adjustments, not taking into account any possible reaction functions of fiscal authorities to the business cycle. The possible existence of such reaction functions are of crucial importance in the mechanisms examined in this paper, hence these variables cannot be used.

As the "structural" surplus, measured by $\log(\bar{r}_{it} / \bar{e}_{it})$, is unknown, it has to be modelled in some realistic way. Three alternative approaches are proposed. Under the first one, it is assumed that the structural surplus follows a deterministic linear trend with a stationary random component, at

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[3] If it is close to 0, than budget balance is insensitive to the short-run changes in GDP. When it is close to 1, the change of output gap by 1 per cent of GDP causes the change of budget balance by ϱ per cent of GDP, where ϱ is approximately equal the share of public revenues in GDP. Strictly speaking, ε_S it is the elasticity of budget balance, measured as the ratio of revenues to expenditures, to output gap, measured as ratio of actual to potential GDP.

least within a reasonably short period. This means that $\log(\bar{r}_{it} / \bar{e}_{it}) = \omega_i + \theta_i t + \eta_{it}$, where η_{it} is an i.i.d. disturbance term. Substituting it into (3) yields:

(4) $$\log(r_{it} / e_{it}) = \omega_i + \theta_i t + \varepsilon_S \log(\tilde{y}_{it}) + \eta_{it}.$$

An alternative is assuming that $\log(\bar{r}_{it} / \bar{e}_{it})$ follows a first-order autoregressive process:

(5) $$\log(\bar{r}_{it} / \bar{e}_{it}) = \phi_i + \mu L \log(\bar{r}_{it} / \bar{e}_{it}) + \eta_{it},$$

where L denotes the lag operator. Consequently,

(6) $$\log(\bar{r}_{it} / \bar{e}_{it}) = (\phi_i + \eta_{it}) / (1 - \mu L).$$

Substituting it into (3) and multiplying by $(1 - \mu L)$ yields finally:

(7) $$\log(r_{it} / e_{it}) = \varphi_i + \mu \log(r_{i,t-1} / e_{i,t-1}) + \varepsilon_S (\log(\tilde{y}_{it}) - \mu \log(\tilde{y}_{i,t-1})) + \eta_{it}.$$

A third possibility considered here is that actual (total) surplus can be modelled as an autoregressive process, while only the changes in output gap influence its level:

(8) $$\log(r_{it} / e_{it}) = \varphi_i + \mu \log(r_{i,t-1} / e_{i,t-1}) + \varepsilon_S (\log(\tilde{y}_{it}) - \log(\tilde{y}_{i,t-1})) + \eta_{it}.$$

If, however, the concept presented in the previous section is correct, then output elasticity of fiscal surplus ε_S in the above equations is a function of surplus itself: lower surplus can reduce the ability of fiscal authorities to respond anti-cyclically, thus reducing (in absolute terms) the value of the coefficient. It should be however noted, that introducing the actual surplus into (4) (or (7), (8), respectively) as the determinant of ε_S causes serious problems stemming from the fact that surplus is itself strongly correlated with the output gap. For this reason, some structural surplus $\bar{s}_{it}$, uncorrelated with $\tilde{y}_{it}$, has to be used instead. Note, that now the sensitivity measure is allowed to vary, both over time and between the countries:

(9) $$(\varepsilon_S)_{it} = \beta_0 + \beta_1 \bar{s}_{it} + \beta_2 \bar{s}_{it}^2.$$

The quadratic term was introduced to allow for the possibility that the relation is non-linear. Substituting (9) into (4), (7) and (8), respectively, yields the final forms of equations:

(10) $$\log(r_{it} / e_{it}) = \omega_i + \theta_i t + \beta_0 \log(\tilde{y}_{it}) + \beta_1 \log(\tilde{y}_{it}) \bar{s}_{it} + \beta_2 \log(\tilde{y}_{it}) \bar{s}_{it}^2 + \eta_{it},$$

(11) $$\log(r_{it} / e_{it}) = \varphi_i + \mu \log(r_{i,t-1} / e_{i,t-1}) + \beta_0 (\log(\tilde{y}_{it}) - \mu \log(\tilde{y}_{i,t-1})) + \\ + \beta_1 (\log(\tilde{y}_{it}) - \mu \log(\tilde{y}_{i,t-1})) \bar{s}_{it} + \beta_2 (\log(\tilde{y}_{it}) - \mu \log(\tilde{y}_{i,t-1})) \bar{s}_{it}^2 + \eta_{it}.$$

$$(12)\qquad \log(r_{it}/e_{it}) = \varphi_i + \mu\log(r_{i,t-1}/e_{i,t-1}) + \beta_0(\log(\tilde{y}_{it}) - \log(\tilde{y}_{i,t-1})) + \\ + \beta_1(\log(\tilde{y}_{it}) - \log(\tilde{y}_{i,t-1}))\bar{s}_{it} + \beta_2(\log(\tilde{y}_{it}) - \log(\tilde{y}_{i,t-1}))\bar{s}_{it}^2 + \eta_{it}.$$

One should be aware of a potential reverse causality problem caused by the fact that higher sensitivity of fiscal balance, resulting from structural features of the system of public finance, is likely to lead governments to pursue more careful budgetary policies in order to avoid high deficits. However, while this structural sensitivity may vary between countries, it is unlikely to fluctuate significantly over time, at least within the sample used here. The estimation methods applied in the analysis are to a large extent robust to this problem due to the fact that they allow for country-specific fixed effects, thus exploiting time rather then cross-sectional variation within the panel.

Data used in estimation

An unbalanced panel of data covering the years 1980-1996 for 12 EU countries[4] is used in the analysis. The chosen period has to fulfil several requirements. Obviously, the sample has to be large to provide sufficient efficiency of the estimator. However, a too long period increases the probability of significant structural shifts within the sample, in particular the large multidirectional swings of $\log(\bar{r}_{it}/\bar{e}_{it})$, making the linear trend used in (10) inappropriate. At the same time, the sample period has to end before the Maastricht treaty and SGP rules effectively started to shape the fiscal policy. Otherwise the result is likely to be biased in favour of the presented hypothesis, as the presence of the deficit limit may itself seriously reduce the scope of anti-cyclical policy under high structural deficit. For this reason year 1996 was chosen as the end year of the panel. However, as a robustness check the analysis for the period 1980-2003 has been performed (see

[4] The sample includes: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, and United Kingdom. Spain and Sweden were excluded because the time series available for these countries covered only 3-4 years.

Table 4 in the Appendix). The results obtained using the extended sample are generally in line with those from the basic sample.

A total of 197 observations were available for the analyzed period 1980-1996 (272 for the longer sample), while this number had to be reduced in some cases due to the used lags. The source of the data is the European Commission's Ameco database (version November 2004). Directly from the database come the following variables: public revenue R_{it}, expenditure E_{it} (both refer to the general government and are computed according to ESA'95 accounting standards), actual GDP and potential GDP (both expressed in constant 1995 prices). The output gap $\tilde{y}_{it}$ is a ratio of real to potential GDP, where the latter variable is provided by the European Commission through the Ameco database and is calculated according to the Commission's methodology.

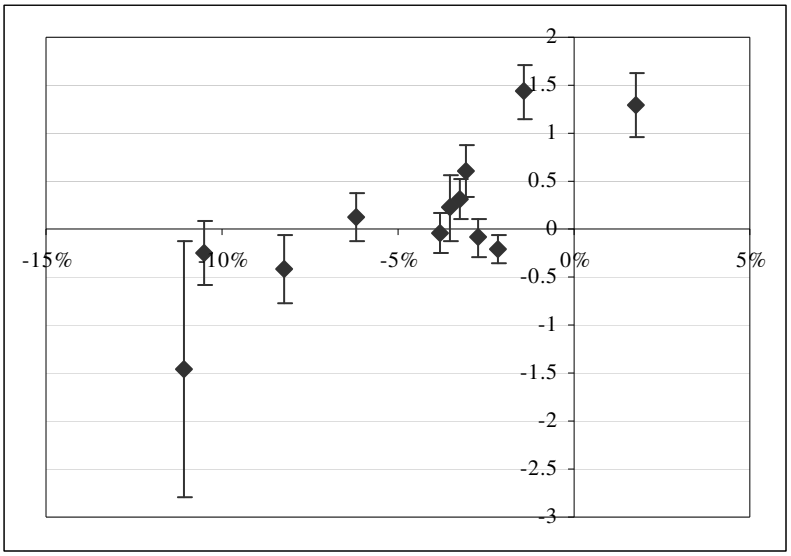
An important question is which measure of structural fiscal surplus should be used for $\bar{s}_{it}$. The approach followed in this paper would suggest defining it analogically to the actual surplus – as the log of the ratio of structural level of revenues to expenditures. However, both in the public and scientific discussion, the ratio of structural surplus to GDP is the most commonly used indicator of the medium-run position of public finances. Hence, the latter measure of medium-term fiscal position is also used here for $\bar{s}_{it}$, in order to make the exposition clear to the readers that are used to this convention. However, replacing it with $\log(\bar{r}_{it} / \bar{e}_{it})$ does not change the results significantly. The values of $\bar{s}_{it}$ used in the analysis are the European Commission's estimates and are obtained directly from the Ameco database.

Table 2 in the Appendix A shows the basic descriptive within-sample statistics of the most important variables. As the logarithms used in the model are not so commonly used and may be thus difficult to interpret, two additional variables are presented: traditionally computed fiscal surplus and the output gap.

Estimation methods and results

As an introductory exploration of the data, equation (7) was estimated independently for each cross-section. Figure 1 shows point estimates of country-specific elasticities ε_i, plotted against average structural surplus in years 1980-1996. The figure suggests that, indeed, there may be some correlation between average surplus and the output elasticity of the budget. Estimating the respective elasticities using the specifications (6) and (8) yields the same conclusions in qualitative terms.

Figure 1 Estimated output elasticities of fiscal surplus (vertical axis, with standard errors), plotted against structural surplus (horizontal axis, in % of GDP)



To examine the relationship quantitatively, coefficients of equations (10)-(12) were estimated. Results of the estimation are presented in Table 3 in the Appendix. To estimate the coefficients of equation (10) the standard fixed effects procedure was used, modified in the sense that it allows for varying trend slope θ_i (estimation (I)). When the lagged dependent variable is used as a regresor, the LS-based methods are inconsistent and biased, so in principle they should not be used for estimation of equations (11) and (12). However, a number of studies (see Kiviet (1995) and Judson and Owen (1999)) suggest that especially in the case of persistent series (high values of μ) the respective bias is small and OLS with fixed effects performs well, compared with other

estimators. For this reason, and as a robustness check, the OLS with fixed effects estimates are also reported (estimations (II) and (V)).

As the central method of estimating the dynamic models, the Arellano-Bond (1991) generalized method of moments procedure is used, with two modifications. The data set allowed to use the $\log(r_{it-2} / e_{it-2}),\ldots,\log(r_{it-11} / e_{it-11})$ as instruments, because, for numerical reasons, the maximum number of included lags is limited by the number of cross-sections. The second, more important problem is imposing non-linear restrictions on parameters in equation (11). The problem was solved by an iterative procedure – the value of μ, estimated as coefficient of $\log(r_{it-1} / e_{it-1})$, was then subsequently used to build the regresors $(\log(\tilde{y}_{it}) - \mu \log(\tilde{y}_{i,t-1}))$ used in the next iteration. In all cases the procedure produced fast convergence toward stable values of $\hat{\mu}$, for any starting values given between 0.3 and 1.0, and was halted when change became smaller than 10^{-6}. Estimates of μ reported in (III) and (IV) are values computed from the last iterations.

A potential problem is the fact that output gap can be itself dependent on the fiscal surplus due to the effect of the fiscal policy on demand. Such a simultaneity can result in biased estimates of ε's and, consequently, of β's. To overcome this problem, in estimations (IV) and (VII) the regresors that contain the output gap were instrumented by their own values lagged by 1 year. As Table 3 shows, this modification has only minor impact on the results.

The computed J-statistics allow to construct the Sargan test for overidentifying restrictions. In most cases (except for the estimation (III) in years 1980-2003) the test does not reject at 1 per cent level of significance the null hypothesis that the instruments used are valid. However, the J-statistics are quite high and the results of no rejection were obtained by relatively narrow margins.

Following the Arellano (1987) approach, all the reported t-statistics are computed using the White coefficient covariance estimates that are robust to arbitrary within cross-section residual correlation. The estimates of μ are all highly significant, and all GMM estimates show the similar order of magnitude. It suggests fiscal surplus being a moderately persistent variable. When

interpreting the estimates obtained from the OLS method, one should note that the respective estimate is typically biased, as the calculated value is likely to incorporate also the influence of possible cross-section-specific effects.

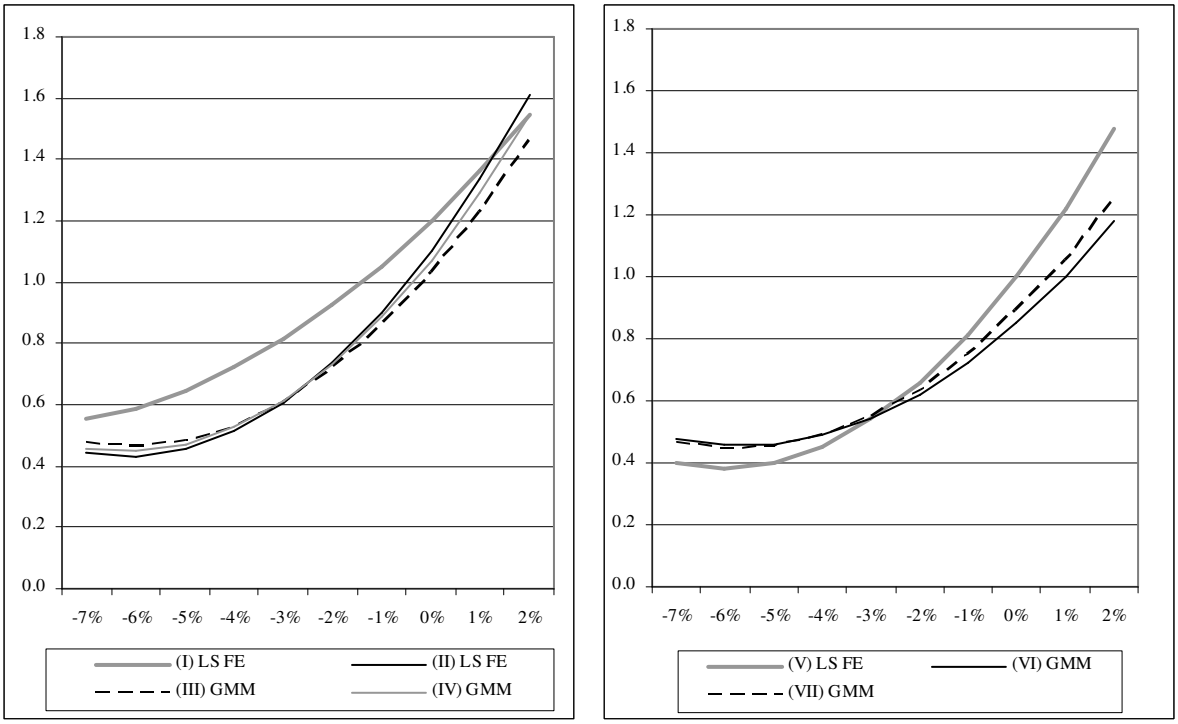
The estimate of β_0, representing the average output elasticity of fiscal surplus under the assumption of cyclically balanced budget, is highly significant in all cases. In a typical situation, when the automatic stabilizers are allowed to work freely, the elasticity is expected to take the values slightly above one. Such a belief results from the fact that the elasticity is the sum of output elasticities of state revenue (roughly equal to 1, as the revenue can be viewed as proportional to output), and elasticity of expenditure. The latter can be expected to be small, as highly output-elastic expenditures, such as unemployment benefits, tend to have a relatively small share in total expenditures. The estimation results (I)-(IV) seem to be roughly in line with these expectations. Estimations (VI) and (VII) yield somewhat smaller values, possibly due to the fact that in equation (12) β_0 captures purely the dynamic effects of change in surplus, while omitting any possible static effects.

Estimations (I)-(VI) show estimates for β_1 being statistically significant at the 1% level, the estimation (VII) doing the same at the 2% level. These results show that, indeed, there is a statistically significant impact of structural fiscal balance on the output elasticities of surplus.[5] Non-linearity of this impact only in some cases has been confirmed at the 5% or 10%

[5] Technically, this statement is equivalent to finding a statistically significant correlation between the actual surplus and the product of structural surplus and the output gap. It may appear that this correlation is natural, as the actual surplus can be decomposed between structural component and the cyclical surplus that is itself a function of the output gap. However, from the fact that a random variable is correlated with its two components does not follow that it has to be correlated with their product. It can be seen from the observation that correlation between the structural surplus and the product of this variable and the output gap is only -0.16 in the pooled sample, while the panel regression with fixed effects yields coefficient -1.09 with the t-statistic equal to -0.84. The author of this paper is grateful to an anonymous referee for pointing out this potential problem.

significance level. However, this result may be due to multicollinearity, as removing the squared term from the specification caused also estimates of β_1 to change the order of magnitude and become insignificant. Attempts to apply the third order polynomial (not reported here) did not notably change the results and the respective coefficient was in most cases statistically insignificant.

Figure 2 Implicit output elasticities of fiscal surplus (vertical axis), conditional on the values of structural surplus as per cent of GDP (horizontal axis)



Estimated values $\hat{\beta}_0$, $\hat{\beta}_1$ and $\hat{\beta}_2$ allow to compute the implicit elasticities of surplus, conditional on the values of structural surplus. Results are presented in Figure 2. Depending on the specific form of equation, the calculated values of $\varepsilon_S(\bar{s})$ differ slightly, while all of them show the same order of magnitude. They can be divided into three groups. The first group consists of one element – the $\varepsilon_S(\bar{s})$'s based on the LS estimator with fixed effects, assuming a stable trend of the underlying structural balance. It yields the highest values of elasticity of surplus under high deficits – for structural surplus equal -5% of GDP, the corresponding elasticity amounts to 0.65, while under balanced budget it reaches 1.20. The latter value is close to values in the second group of results, obtained for specification (11), where it amounts to 1.03 ÷ 1.10. In this group,

however, the implicit elasticities under surplus equal to -5% GDP are notably lower, between 0.45 and 0.47. The last group consists of elasticities based on estimations (V), (VI) and (VII). They, in turn, present similar order of magnitude in the presence of high deficits (0.40 to 0.46) while under the balanced budget the computed values amount to 0.85 ÷ 1.00. Two of the latter results obtained from the GMM estimation are smaller than unity, which contradicts an earlier supposition that elasticities are expected to be slightly greater than 1. As it was mentioned before, the lower values can be probably attributed to the fact that in specification (12) they measure only the dynamic impact, while in the previous equations the $\varepsilon_S(\bar{s})$'s measured the static influence.

Conclusions

Analysis presented in this paper shows that there is a positive relationship between the structural surplus and the cyclical elasticity of the fiscal surplus. While under a balanced structural budget the respective elasticity takes the values of 0.9÷1.2 (depending on the definition and equation specification), it is reduced by 46÷57% on average, when structural surplus drops to the level of -5% GDP. According to the preferred interpretation, under high permanent fiscal deficits, the pressure coming from either financial or political markets does not allow the typical government to borrow more in downturn, thus narrowing the room for anti-cyclical fiscal policy. The presence of such a relationship raises some scepticism about the possible results of making the Stability and Growth Pact more flexible by alleviating the existing deficit rule. According to the results obtained here, possible deterioration of public finance in the Eurozone countries resulting from such a reform is likely not to be coupled with stronger anti-cyclical policy. Then, if the Pact is to be reformed, the reform should possibly go in a different direction, incorporating more comprehensive measures than merely adjusting the tight deficit rule to the growing deficit pressure in some of the EMU member countries.

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Appendix A: Basic statistics

Table 1 General government structural surplus (as % of GDP) in years 1999-2003

Country	Average	Number of years with structural deficit
Austria	-1.2%	4
Belgium	0.1%	2
Denmark	0.9%	0
Finland	3.4%	0
France	-2.8%	5
Germany	-2.5%	5
Greece	-3.7%	5
Ireland	0.5%	2
Italy	-2.4%	5
Netherlands	-1.3%	5
Portugal	-3.5%	5
Spain	-0.2%	3
Sweden	2.4%	0
United Kingdom	-0.5%	2

Source of the data: European Commission's Ameco database

Table 2 Descriptive statistics of the sample

Variable	Description	Mean	Median	Std. deviation
$\log(r_{it} / e_{it})$	Actual surplus^{+}	-0,1015	-0,0783	0,0920
$\log(\tilde{y}_{it})$	Output gap^{+}	-0,0097	-0,0110	0,0240
$\bar{s}_{it}$	Structural surplus^{+++}	-0,0427	-0,0360	0,0402
$r_{it} - e_{it}$	Actual surplus^{++}	-0,0479	-0,0410	0,0417
$\tilde{y}_{it} - 1$	Output gap^{+++}	-0,0093	-0,0109	0,0238

Source of the data: European Commission's Ameco database
$^{+}$ defined in text; $^{++}$ per cent of GDP; $^{+++}$ per cent of potential GDP

Appendix B: Estimation results

Table 3 Estimation results for the sample 1980-1996

Estimation	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
Method	LS	LS	GMM	GMM	LS	GMM	GMM
Effects	Cross-section	Cross-section	Cross-section	Cross-section	Cross-section	Cross-section	Cross-section
Lags of instruments[+]	x	x	0	1	x	0	1
Theoretical model	(10)	(11)	(11)	(11)	(12)	(12)	(12)
Constant	-0.222*** *-57.476*	-0.020*** *-4.728*	x	x	-0.017*** *-3.064*	x	x
μ	x	0.763*** *17.639*	0.736*** *17.746*	0.733*** *16.187*	0.798*** *14.279*	0.776*** *14.762*	0.773*** *14.739*
β_0	1.200*** *6.679*	1.102*** *8.413*	1.027*** *8.273*	1.073*** *8.722*	1.000*** *9.002*	0.850*** *7.836*	0.888*** *8.650*
β_1	15.589** *2.513*	21.852*** *3.304*	18.613*** *3.213*	20.255*** *2.950*	20.460*** *3.382*	13.913*** *2.822*	15.260*** *2.591*
β_2	90.430 *1.079*	178.019* *1.900*	153.039* *1.804*	164.224* *1.837*	169.586* *1.966*	122.271 *1.614*	131.763 *1.639*
R-sq	0.901	0.894	-0.473	-0.472	0.892	-0.543	-0.541
Adj. R-sq	0.883	0.884	-0.498	-0.497	0.882	-0.568	-0.567
SSR	0.165	0.168	0.297	0.297	0.171	0.311	0.311
DW	1.283	1.900	x	x	1.949	x	x
F-statistic	50.285	-4.011	x	x	-3.994	x	x
J-statistic	x	x	198.914	198.370	x	195.779	196.993
p-values[++]	x	x	0.041	0.044	x	0.057	0.050

[+] *lags of instruments of the predetermined regressors;*
[++] *Sargan's test for overidentifying restrictions*
*/**/*** *denote estimates significant at, respectively, 10, 5 and 1 per cent level.*

Table 4 Estimation results for the sample 1980-2003

Estimation	(I)	(II)	(III)	(IV)	(V)	(VI)	(VII)
Method	LS	LS	GMM	GMM	LS	GMM	GMM
Effects	Cross-section	Cross-section	Cross-section	Cross-section	Cross-section	Cross-section	Cross-section
Lags of instruments[+]	x	x	0	1	x	0	1
Theoretical model	(10)	(11)	(11)	(11)	(12)	(12)	(12)
Constant	-0.268*** *-24.941*	-0.007** *-2.480*	x	x	-0.006** *-2.426*	x	X
μ	X	0.851*** *21.586*	0.852*** *27.340*	0.854*** *27.130*	0.873*** *27.936*	0.870*** *29.603*	0.872*** *30.066*
β_0	1.221*** *4.869*	1.207*** *10.085*	1.161*** *8.311*	1.199*** *7.881*	1.131*** *10.489*	1.048*** *7.969*	1.080*** *7.720*
β_1	12.343* *1.681*	23.508*** *5.098*	20.836*** *3.888*	21.106*** *3.351*	21.653*** *4.643*	17.363*** *3.240*	17.638*** *2.788*
β_2	79.186 *0.885*	189.538** *2.496*	166.827** *2.265*	166.934** *2.154*	173.920** *2.360*	140.926* *1.957*	141.667* *1.850*
R-sq	0.840	0.885	-0.536	-0.543	0.884	-0.580	-0.585
Adj. R-sq	0.815	0.878	-0.554	-0.560	0.877	-0.598	-0.603
SSR	0.398	0.252	0.459	0.461	0.254	0.472	0.474
DW	0.746	1.871	x	x	1.909	x	x
AIC	-3.560	-4.031	x	x	-4.020	x	x
SIC	-3.172	-3.818	x	x	-3.807	x	x
F-statistic	44.206	131.191	x	x	129.560	x	x
J-statistic	x	x	277.906	275.595	x	275.169	273.421
p-values	x	x	0.032	0.039	x	0.048	0.049

[+] *lags of instruments of the predetermined regressors;*
[++] *Sargan's test for overidentifying restrictions*
*/**/*** *denote estimates significant at, respectively, 10, 5 and 1 per cent level.*