

THE DISCRETIONARY FISCAL EFFORT: AN ASSESSMENT OF FISCAL POLICY AND ITS OUTPUT EFFECT

Nicolas Carnot^(*)

Francisco de Castro^(*)

Abstract

This paper presents an indicator of the fiscal stance that combines features of the bottom-up, narrative approach on the revenue side with a refined version of the top-down, traditional approach of the structural balance on the expenditure side. With these characteristics the indicator offers an image of fiscal policy that avoids both the 'endogeneity problems' of the structural balance and the 'indeterminacy' of the narrative approach. This indicator is used to shed light on EU fiscal policies and estimate the average short-term output effects of fiscal policy. Results suggest that, with exceptions, fiscal policy has been conducted in a more stop and go and pro-cyclical fashion over the past decade than suggested by traditional indicators. The average fiscal multiplier is estimated at 0.8-0.9, with higher (resp. lower) multipliers associated with expenditure (resp. revenue) shocks, and higher (resp. lower) multipliers in times of declining (resp. increasing) output gaps.

JEL Classification: E62, H60.

Keywords: Fiscal Stance; Discretionary Fiscal Effort; Fiscal Consolidation; Fiscal Multipliers.

(*) We thank Matteo Salto for useful discussions and comments. The views in the paper are exclusively those of the authors and should not be attributed to the European Commission. Contact: Nicolas Carnot, DG ECFIN, European Commission, CHAR 12/078, B-1049 Brussels, Belgium, nicolas.carnot@ec.europa.eu; Francisco de Castro, DG ECFIN, European Commission, CHAR 12/093, B-1049 Brussels, Belgium, francisco.de-Castro@ec.europa.eu

1. Introduction

The purpose of this paper is two-fold. First, it presents an indicator of the fiscal stance, the discretionary fiscal effort (DFE), which is not exposed to the common robustness and endogeneity problems of standard measures such as the cyclically-adjusted (or structural) balance. Second, the paper uses this indicator to empirically estimate the short-term output effect of a change in fiscal policy (the fiscal multiplier), and the composition- and state-dependency of that effect, across a panel of EU countries over the past decade.

The questions of distinguishing the policy-driven part of fiscal developments, as opposed to their endogenous response to the environment, and of evaluating the short-term impact of fiscal changes on activity, are long-standing ones in the literature (Blanchard, 1990). Both questions have given rise to an abundant research, with a resurgence of interest in recent years as the economic and financial crisis has revived discussions about the macroeconomic role of fiscal policy.

In a traditional approach, the structural balance, or rather the change therein, is taken as a suitable measure of the fiscal stance¹. This is a top-down and outcome-oriented indicator of fiscal policy, which benefits from being widely-known and routinely calculated. An important strand of the literature indeed relies on this notion when investigating topics such as the impact of stimuli packages or the (non-)success of budgetary consolidation episodes (see e.g. Alesina and Perotti, 1995 ; Ardagna, 2004 ; Kumar *et alii*, 2007 ; and European Commission, 2010). However, the structural balance has been increasingly criticised as a measure of the fiscal effort given in particular the empirically large fluctuations in the response of tax revenues and unemployment spending to the output gap (see, among many, Eschenbach and Schucknecht, 2002 ; Lendvai *et alii*, 2011). This 'endogeneity feature' of the structural balance is especially problematic for estimating the fiscal multipliers from observed data (Guajardo *et alii*, 2011).

As a possible alternative, the 'narrative approach' evaluates the fiscal effort by adding up the measures adopted in actual budgets and reported in budget documentation or other verifiable communication (Romer and Romer, 2010). The narrative approach gives a bottom-up metric of fiscal actions which has been argued to be more robust than the traditional approach in identifying fiscal innovations and estimating multipliers (Favero and Giavazzi, 2010 ; Ramey, 2011 ; IMF, 2010 and Guajardo *et alii* , 2011). However, in the narrative approach it is not clear whether and why an absence of identified measures can genuinely be equated with a neutral policy stance. Nor is it straightforward to inventory fiscal actions in a manner that is encompassing enough for practical purposes (Devries *et alii*, 2011, make an attempt for consolidation measures).

The approach taken in this paper uses a combination of the traditional and narrative approaches. On the revenue side, our indicator relies, like the narrative approach, on a bottom-up assessment. It does so while making use of the data on new tax measures collected

¹ Or the change in the structural primary balance. In the usual EU terminology, the structural balance is defined as the cyclically-adjusted balance net of one off and other temporary measures. For a presentation and discussion of the EU methodology, see Larch and Turrini (2009) and Mourre *et alii* (2013).

and increasingly scrutinised as part of EU fiscal surveillance. On the expenditure side, our method is close to the traditional top-down approach of the structural balance, although it makes two adjustments: one is removing from the expenditure aggregate a couple of spending items deemed beyond the authorities' control in the short-run (interest and unemployment expenditures); the other is using a smoother notion of potential growth than usual. Thereby the trend against which expenditure policies are benchmarked is more stable, and deviations from that trend are better proxies of actual policy changes.

With this set of choices the discretionary fiscal effort is meant to largely avoid the endogeneity issues disturbing the structural balance, as it is not exposed to gyrations in tax or unemployment spending elasticities. At the same time it mitigates the challenges of the narrative approach as, first, it relies on a dedicated data set of revenue measures, and second a null value of the discretionary fiscal effort can more consistently be equated to a neutral fiscal stance. These properties allow using the indicator to shed new light on the conduct of EU fiscal policies, in complement to the standard approach of the structural balance.

The empirical part of this paper confirms that the description of fiscal policies is to an important extent influenced by the choice of approach. While over time the DFE and the change in the structural balance tend to convey the same messages, sizeable differences between the two indicators are observed at critical specific episodes. Departures of actual revenue elasticities from their average value (e.g. windfalls or shortfalls in liaison with the boom and bust cycles) are a major contributor to the gap between the change in the structural balance and the discretionary fiscal effort, with other factors playing also a role. In particular, the discretionary fiscal effort suggests that, with some exceptions, fiscal policy in the EU has been conducted in a more stop and go and pro-cyclical fashion over the past ten years than suggested by traditional indicators.

As the properties of the discretionary fiscal effort permit interpreting it as a reasonable proxy for fiscal shocks, it feeds naturally into an empirical study of fiscal multipliers. Our methodology relates output growth to the discretionary fiscal effort and other controlling factors in a panel of EU countries. We rely on both on ordinary least Squares (OLS) and instrumental variables frameworks. The results of both are relatively close, as could be expected since the discretionary fiscal effort is believed to be already broadly cleansed from endogeneity features. Significant limitations of our empirical work, however, relate to the relatively limited time span, the uncertainty in parts of the data (notably the yields of tax measures in early years of the panel), and the panel approach which only allows us to estimate an average, non-country dependent multiplier.

With these caveats in mind we find point estimates of short-run output multipliers of the order of 0.8-0.9 on average, with 95% uncertainty ranges of +/-0.2. Fiscal multipliers are known to depend largely on the composition of fiscal shocks and on circumstances. By breaking down the discretionary fiscal effort between aggregate expenditure and revenue shocks, we find, in line with the majority of other papers, higher expenditure multipliers (of the order of 1.0 or above and up to 1.4) than revenue multipliers (around 0.5 or a bit below). We also attempt to differentiate multipliers with economic conditions using as a proxy thereof different

combinations of the output gap. While results based on the level of the output gap are inconclusive in our panel, we find some differentiation between good and bad times as defined by a positive (respectively negative) change in the output gap, with the average multiplier being significantly lower in the former case and the tax and spending multipliers being generally lower as well.

The rest of this paper is organised as follows. Section 2 motivates the introduction of the discretionary fiscal effort, presents its evaluation, and shows how it relates to and differ from the (change in) the structural balance. Section 3 discusses fiscal developments across the EU in the past decade in the light brought by the discretionary fiscal effort. Section 4 uses the discretionary fiscal effort to evaluate the short-term output effects of fiscal shocks in a panel of EU countries. Section 5 concludes.

2. The discretionary fiscal effort²

2.1 Background : traditional and narrative approaches to the fiscal stance

As noted in the introduction, a growing literature suggests a narrative, bottom-up approach to assessing the fiscal stance, which consists in adding up the evaluated yield of measures presented in budget documents. This approach aims at improving on the change in the structural balance for identifying the effective size and timing of the policy effort. Indeed, a widely-known limitation of the structural balance is the presence of significant windfalls or shortfalls in revenues (or, to a lesser extent, in unemployment benefit spending) that are not accounted for by standard cyclical corrections. For example, persistent but non-permanent variations in asset prices or changes in the composition of growth can generate shifts in revenues that are incorrectly identified as structural developments. Technically such windfalls or shortfalls translate into actual fiscal elasticities departing from the ones underlying the computation of cyclically-adjusted and structural balances.³ Another challenge stems from the uncertainty of potential output measurement, particularly in real time where errors typically turn out to be correlated with cyclical developments.

While the narrative approach overcomes these shortcomings, it is not without hard challenges itself. First, it has to rely on a sufficiently encompassing informational base. This does not go without saying as the information available in budget documents may represent only a fraction of the measures actually implemented, both because national budgets do not cover the whole general government sector (which is relevant from a national accounts perspective) and because measures impacting on the public finances may be taken outside annual (or supplementary) budgets. In addition, the information taken from real-time budgets may be biased and can be revised in the light of further information. Second, while on the revenue side an absence of measure can reasonably be equated with a neutral stance, there is generally no reason for that to be the case on the expenditure side. For example, letting entitlements

² This part of the paper builds on work largely presented in European Commission (2013).

³ The aggregate elasticity of tax revenues to output is typically taken to be close to unity, although elasticities of specific tax categories, such as personal income or corporate taxes, may differ significantly.

grow above the trend rate of output would usually be described as non-action in a narrative approach while it would more appropriately be seen as stimulus from a macroeconomic point of view. This 'indeterminacy' of a pure bottom-up on the expenditure side suggests that the benchmark of 'no-measure' should rather be akin to having expenditure grow at a rate in line with a concept of trend output. Besides, one should preferably employ a rather smooth notion of trend growth in a bottom-up perspective because only on that condition can one interpret an absence of significant deviation from that trend with an absence of measures.

In view of the weaknesses of both the top-down and bottom-up approaches, this paper presents an alternative indicator, the discretionary fiscal effort (DFE), which combines features of both approaches and arguably eliminates or at least largely mitigates the concerns raised above. In particular, the discretionary fiscal effort has the attraction of being broadly immune to the endogeneity problems affecting the structural balance on the revenue side while relying on a more conventional approach on the expenditure side avoiding a main shortcoming of the narrative approach, namely the lack of a benchmark against which to gauge policy choices on the expenditure side.

2.2 The discretionary fiscal effort: definition

The discretionary fiscal effort is defined as:

$$DFE_t = DFE_t^R + DFE_t^G = \frac{N_t^R}{Y_t} - \frac{(\Delta E_t - pot.E_{t-1})}{Y_t} \quad (1)$$

where N^R stands for the budgetary impact of all revenue measures in year t , Y_t is nominal GDP, E_t is general government expenditure adjusted as indicated below and pot is medium-term potential growth, as defined subsequently.

The discretionary fiscal effort represents a mixed method for assessing the fiscal stance in the following sense:

- On the revenue side, it relies on a truly bottom-up approach, as the effort is computed by adding-up the effects of new tax measures in the year of interest. This includes, when relevant, the incremental effect in a given year of tax measures adopted in earlier years. The main difference with the structural balance stems from the fluctuations in tax elasticities from their average values, which are quite large in practice.
- On the expenditure side however, an essentially top-down method is kept by measuring the effort as the gap between the growth of public spending and potential growth. This is because of the indeterminacy problem of the narrative approach noted above, but also for a more positive reason. Defined this way, the discretionary fiscal effort indicates whether policy is inducing growth above or below trend GDP. In particular, a neutral stance corresponds to a situation where the authorities do not aim at changing the medium-run values of the tax and expenditure to GDP ratios; that is, there is no attempt to stimulate demand above or below potential growth.

While the approach to the spending side is more conventional and closer to the structural balance methodology, two important differences must be underlined:

- First, interest payments and all non-discretionary changes in unemployment expenditure are removed from the expenditure aggregate as they are deemed to be outside the control of policymakers in the short run.

The adjusted expenditure is thus:

$$E_t = G_t - U_t^{nd} - I_t$$

where G_t is general government expenditure and U_t^{nd} and I_t refer to non-discretionary unemployment expenditure and interest payments respectively.

- Second, a 'smoother' than usual notion of potential growth is used. Specifically, we use a 10-year moving average of potential growth as estimated in the EU methodology (d'Auria *et alii*, 2010). Specifically:

$$pot_t = (Y_{t+4}^*/Y_{t+5}^*)^{1/10} - 1$$

where Y_t^* is real potential GDP in year t .⁴ This notion is the 'reference rate' already used when evaluating the expenditure benchmark in the EU fiscal framework. It is more stable by construction than the standard measure.

These adjustments are important for getting closer to a time-invariant notion of the underlying fiscal effort. In particular, for a given amount of expenditure measures, the evaluated fiscal stance will not too significantly be affected by temporary fluctuations in activity and potential growth. That is because the expenditure items most clearly beyond the control of the budgetary authorities in the short-run are removed, and because the trend that serves as reference to assess expenditure growth is relatively smooth.

In addition, the discretionary fiscal effort is constructed while netting out one off and other temporary measures on both the revenue and the expenditure sides. That is, the revenue measures N_t^R and the adjusted expenditure E_t entering equation (1) are cleaned from one offs and temporary measures. This is analogous to what is done in EU surveillance for calculating structural balances. While there is no universal definition of one offs and there are borderline cases, we rely empirically on the data used in EU surveillance.

2.3 Discussion and limitations

The discretionary fiscal effort can be conceptually understood as a reformulation, in the form of an indicator of the fiscal stance, of the expenditure benchmark introduced into EU

⁴ The variable *pot* as set above is multiplied by GDP deflator inflation before entering equation (1), so that the nominal growth of the expenditure aggregate E is benchmarked against a notion of 'nominal' potential growth.

surveillance with the six-pack. There are however, a few technical differences between the two notions.⁵

Overall, by being more directly connected with policy decisions, the discretionary fiscal effort overcomes the problems associated with cyclically-adjusted balances when taken as a faithful reflection of policy decisions on an annual basis. At the same time, the discretionary fiscal effort is encompassing enough to be quite tightly connected with overall fiscal outcomes in the medium-term, or at least, to supply a roughly right measure of the actual direction and size of fiscal policy.

The evidence provided in this paper points to significant benefits from using the discretionary fiscal effort for enriching the analysis of the fiscal stance. The discretionary fiscal effort suffers from some limitations though:

- First, it relies on estimates of the budgetary costs or savings from tax and spending measures that come with their own measurement uncertainties, particularly when the underlying data for evaluating measures is lacking or of poor quality. This is partly mitigated in our framework by relying on the increasingly scrutinised dataset of discretionary revenue measures used in EU surveillance. Further progress would however be needed to improve the quality and cross-country consistency of these data.
- Second, the choice of trend growth on the expenditure side is the outcome of a fairly ad hoc procedure which, if effective for obtaining a smooth series, remains linked to an uncertain evaluation of potential output in the first place. In addition, because the evaluation of potential growth is affected by current growth, there may remain a degree of reverse causality in the relationship between contemporary growth and the discretionary fiscal effort. In other words, we can see the discretionary fiscal effort as largely but not entirely cleaned from the endogeneity problems affecting the structural balance, when it comes to estimate the fiscal multipliers in a regression model. We deal further with this aspect in the panel estimation (see section 4).

2.4 Decomposition of the difference between the change in the structural balance and the discretionary fiscal effort

Further analysis of the underlying reasons for the gap between the two indicators can be performed by breaking down the difference into four main components, as well as a small residual term capturing other factors (Annex 1 works out the analytical decomposition):

⁵ There are four differences between the discretionary fiscal effort and a literal reformulation of the expenditure benchmark as an indicator of the fiscal stance: first, the expenditure benchmark smoothenes public investment over three years; second the expenditure benchmark nets out government expenditure programmes fully matched by revenues from EU funds; third, to relate nominal expenditure and real potential growth, the expenditure benchmark employs the average of the GDP deflator inflation forecasts for year t made by the Commission in spring and autumn of year $t-1$, while the discretionary fiscal effort uses the actual GDP deflator inflation; fourth, the discretionary fiscal effort corrects for one-offs and other temporary measures in the same way as the structural balance. The choices made for the expenditure benchmark have a history of their own. However, from the point of view of building an indicator of the underlying fiscal stance as well as for reasons of simplicity, the choices made for the discretionary fiscal effort seem preferable.

- Revenues windfalls and shortfalls. This reflects the difference between the actual (i.e. observed each period) and the average (i.e. used in the standard calculation of the structural balance) semi-elasticity of revenues to the output gap.
- Windfalls or shortfalls in unemployment expenditure, as compared with standard elasticities that capture the average cyclical of unemployment benefits in the structural balance calculations.
- The gap between annual potential growth and medium-term expectations of potential growth, as measured by the 'smoother' reference rate of potential growth, times the share of expenditure in GDP.
- Changes in interest payments.

Identifying quantitatively the contributing factors to the gap between the two indicators generally provides further insight about underlying economic developments. It thereby allows a more robust assessment of the direction of fiscal policy. In practice (see section 3), all four components may contribute significantly, although the primary source of difference appears to be revenues windfalls/shortfalls, followed by the potential growth wedge and then changes in interest payments.

3. Fiscal developments over the past decade in the EU

This section uses the discretionary fiscal effort, in comparison with the structural balance, to revisit fiscal developments across EU countries over the past decade.

The data used in the empirical analysis is mostly extracted from the European Commission's AMECO database, including data on GDP, potential GDP and the public finances (including structural balance and one off and temporary measures series). The AMECO data underlying the Commission's spring 2014 forecast is used.

Discretionary revenue measures are taken in AMECO from 2011 onwards, and from the Output gap working group reporting before that year (Princen *et al.*, 2013). The latter sample starts in the early 2000s for most countries (for a few countries, the series starts at a later date).

All in all, we have data that allow computing the discretionary fiscal effort over the past decade (2004-2013) across 27 EU countries (Croatia is not included owing to lack of sufficient data).

3.1 Overall developments

The first stylized fact is that the change in the structural (primary) balance tends to yield an over-optimistic –i.e. more stabilizing than it really is– view of the fiscal stance in booms, while it tends to underestimate the fiscal effort in recessions. This is mainly due to the revenue windfalls/shortfalls (and to a lower extent to windfalls/shortfalls in unemployment

expenditure) that show up as a consequence of the fluctuations in tax (and unemployment) elasticities and by construction are part of structural balances. The discretionary fiscal effort appears somewhat less exposed to these problems in that it relies on enacted measures on the revenue side and on deviations from the medium-term potential growth on the expenditure side.

Table 1 illustrates this aspect by comparing the discretionary fiscal effort and the change in the structural primary balance by sub-periods.⁶ In the boom period from 2004 until 2007 the difference between the two indicators is frequently negative, with the discretionary fiscal effort showing a looser orientation of fiscal policy. This is most noticeable in several countries engaged in a boom and bust cycle (Bulgaria, Estonia, Ireland, Spain, Cyprus, Latvia, Lithuania and Romania), where sizeable revenue windfalls were registered, jointly with likely overestimations of potential growth. Similar albeit more limited effects can be observed in other countries (including France and Italy). However, there is a diversity of country experiences, as this pattern of revenue windfalls associated with strong growth is not found in a few other EU countries, most notably in Germany.

Following the outbreak of the crisis in 2008, sizeable stimulus packages were adopted between 2008 and 2010 in a large majority of countries. This is generally captured by a significantly negative value of both indicators. However, in quite a few countries, there have been at the same time significant revenue shortfalls (see Figure 1) and large unemployment expenditure increases going beyond average reactions. The concerned countries broadly coincide with the group that experienced large revenue windfalls in the preceding period (including Bulgaria, Estonia, Ireland, Spain, Cyprus, Latvia, Lithuania and Romania). In this group, fiscal policy has been less supportive, based on the discretionary fiscal effort metric, than would be inferred from reading only the structural balance. In fact, in the Baltic countries and in Bulgaria and Romania, policies were tightened according to the discretionary fiscal effort, which is easier reconciled with the financial tensions and adjustments underwent by these countries over these years. Across the EU as a whole however, there is no doubt that fiscal policy was considerably supportive of activity in this period. The discretionary fiscal effort shows that the loosest fiscal stance was implemented in Belgium Denmark, Germany, Spain, Cyprus, the Netherlands, Poland, Portugal, Slovenia and Finland. In these countries, the cumulated degree of loosening over 2008-2010 reaches 3-6% of GDP according to the discretionary fiscal effort.

Between 2011 and 2013 ambitious consolidation packages are adopted in most Member States and accordingly both indicators unveil a generally tight fiscal stance. However, against a context of severe economic slowdown the discretionary fiscal effort usually suggests a tighter fiscal stance, particularly in the countries most affected by the boom and bust cycle and under close market scrutiny. These countries include Ireland, Greece, Spain, Italy, Cyprus, Romania and Slovenia and to a lesser extent Portugal. Over 2011-2013, the average

⁶ The change in the structural balance is not presented to ensure a more direct comparison in that the change in interest payments is one of the main explanatory factors behind the difference between the two indicators. Annual potential output and smoothed potential output are calculated based on ex-post data as opposed to real time data. This applies to both indicators of the fiscal stance.

annual degree of fiscal consolidation in these countries has exceeded 2% of GDP or even significantly more in some of them, according to the discretionary fiscal effort metric. In a few economies however (including Germany in particular), the degree of adjustment suggested by the discretionary fiscal effort is actually smaller than with the change in the structural balance.

Table 1. The change in the structural primary balance and the discretionary fiscal effort, 2004-2013

| | DFE (1) | | | | Change in the structural primary balance (2) | | | | Difference (1)-(2) | | | |
|-------|-------------------|-------------------|-------------------|-------------------|--|-------------------|-------------------|-------------------|--------------------|-------------------|-------------------|-------------------|
| | Average 2004-2007 | Average 2008-2010 | Average 2011-2013 | Average 2004-2013 | Average 2004-2007 | Average 2008-2010 | Average 2011-2013 | Average 2004-2013 | Average 2004-2007 | Average 2008-2010 | Average 2011-2013 | Average 2004-2013 |
| BE | -0.2 | -1.2 | 0.0 | -0.4 | -0.4 | -0.8 | 0.3 | -0.3 | 0.3 | -0.4 | -0.3 | -0.1 |
| BG | -1.2 | 1.7 | 0.3 | 0.1 | -0.1 | -0.8 | 0.4 | -0.2 | -1.1 | 2.5 | -0.1 | 0.3 |
| CZ | 1.1 | -0.1 | 1.8 | 1.0 | 0.8 | -0.4 | 1.5 | 0.7 | 0.2 | 0.3 | 0.3 | 0.3 |
| DK | -0.4 | -1.1 | 0.3 | -0.4 | 0.3 | -0.8 | 0.2 | -0.1 | -0.7 | -0.2 | 0.1 | -0.3 |
| DE | 0.6 | -1.0 | 0.4 | 0.1 | 0.6 | -0.5 | 0.8 | 0.3 | 0.1 | -0.5 | -0.4 | -0.2 |
| EE | -1.6 | 2.2 | 0.0 | 0.0 | -0.5 | 0.3 | 0.1 | -0.1 | -1.0 | 2.0 | -0.2 | 0.1 |
| IE | -1.6 | 1.1 | 2.2 | 0.3 | -0.7 | -1.7 | 1.5 | -0.3 | -0.9 | 2.7 | 0.6 | 0.7 |
| EL | #N/A | #N/A | 5.8 | #N/A | -0.6 | 0.0 | 3.1 | 0.7 | #N/A | #N/A | 2.7 | #N/A |
| ES | -0.7 | -1.1 | 3.3 | 0.4 | 0.3 | -2.5 | 1.9 | -0.1 | -0.9 | 1.3 | 1.4 | 0.4 |
| FR | -0.4 | -0.6 | 1.1 | 0.0 | 0.0 | -0.5 | 0.9 | 0.1 | -0.4 | -0.2 | 0.2 | -0.1 |
| IT | 0.2 | -0.3 | 1.9 | 0.6 | 0.5 | -0.2 | 1.2 | 0.5 | -0.3 | -0.1 | 0.7 | 0.1 |
| CY | 0.6 | -1.6 | 4.2 | 1.0 | 2.4 | -2.8 | 1.1 | 0.4 | -1.8 | 1.3 | 3.1 | 0.6 |
| LV | -1.6 | 4.9 | 0.5 | 1.0 | -0.7 | 0.8 | 0.7 | 0.2 | -0.9 | 4.1 | -0.2 | 0.8 |
| LT | -1.9 | 1.0 | 1.6 | 0.0 | -0.5 | -0.1 | 0.8 | 0.0 | -1.3 | 1.1 | 0.8 | 0.0 |
| LU | #N/A | #N/A | 0.2 | #N/A | 0.2 | -0.3 | 0.4 | 0.1 | #N/A | #N/A | -0.1 | #N/A |
| HU | #N/A | #N/A | -2.3 | #N/A | 0.6 | 0.8 | 0.8 | 0.7 | #N/A | #N/A | -3.1 | #N/A |
| MT | 0.4 | 0.0 | -0.3 | 0.1 | 0.7 | -0.5 | 0.6 | 0.3 | -0.2 | 0.4 | -0.9 | -0.2 |
| NL | 0.4 | -0.9 | 1.7 | 0.4 | 0.1 | -1.1 | 0.9 | 0.0 | 0.3 | 0.2 | 0.9 | 0.4 |
| AT | 0.0 | -0.8 | 0.8 | 0.0 | -0.3 | -0.5 | 0.7 | -0.1 | 0.3 | -0.3 | 0.1 | 0.1 |
| PL | -0.3 | -1.3 | 2.2 | 0.1 | 0.1 | -1.6 | 1.5 | 0.0 | -0.5 | 0.4 | 0.7 | 0.1 |
| PT | 0.2 | -1.7 | 2.9 | 0.4 | 0.6 | -1.6 | 2.4 | 0.5 | -0.4 | -0.1 | 0.4 | 0.0 |
| RO | -2.7 | 1.6 | 2.5 | 0.4 | -1.1 | -0.1 | 1.5 | 0.0 | -1.7 | 1.7 | 1.0 | 0.4 |
| SI | -0.5 | -1.1 | 2.4 | 0.3 | -0.1 | -0.6 | 1.1 | 0.1 | -0.3 | -0.5 | 1.3 | 0.2 |
| SK | 0.1 | -0.8 | 1.7 | 0.3 | -0.9 | -1.0 | 2.0 | -0.1 | 0.9 | 0.1 | -0.3 | 0.3 |
| FI | -0.9 | -2.0 | 0.2 | -0.9 | -0.2 | -1.4 | 0.1 | -0.5 | -0.7 | -0.6 | 0.1 | -0.4 |
| SE | -0.1 | -0.4 | -0.4 | -0.3 | 0.4 | -0.5 | -0.4 | -0.1 | -0.6 | 0.1 | 0.1 | -0.2 |
| UK | -0.6 | -0.7 | 1.2 | -0.1 | -0.1 | -1.1 | 1.1 | 0.0 | -0.5 | 0.3 | 0.1 | -0.1 |
| EA-17 | 0.0 | -0.8 | 1.4 | 0.2 | 0.2 | -0.8 | 1.1 | 0.2 | -0.2 | 0.0 | 0.3 | 0.0 |
| EU-27 | -0.2 | -0.7 | 1.3 | 0.1 | 0.2 | -0.8 | 1.0 | 0.1 | -0.3 | 0.1 | 0.3 | 0.0 |

Source: AMECO (Commission Spring 2014 forecast), authors' calculations.

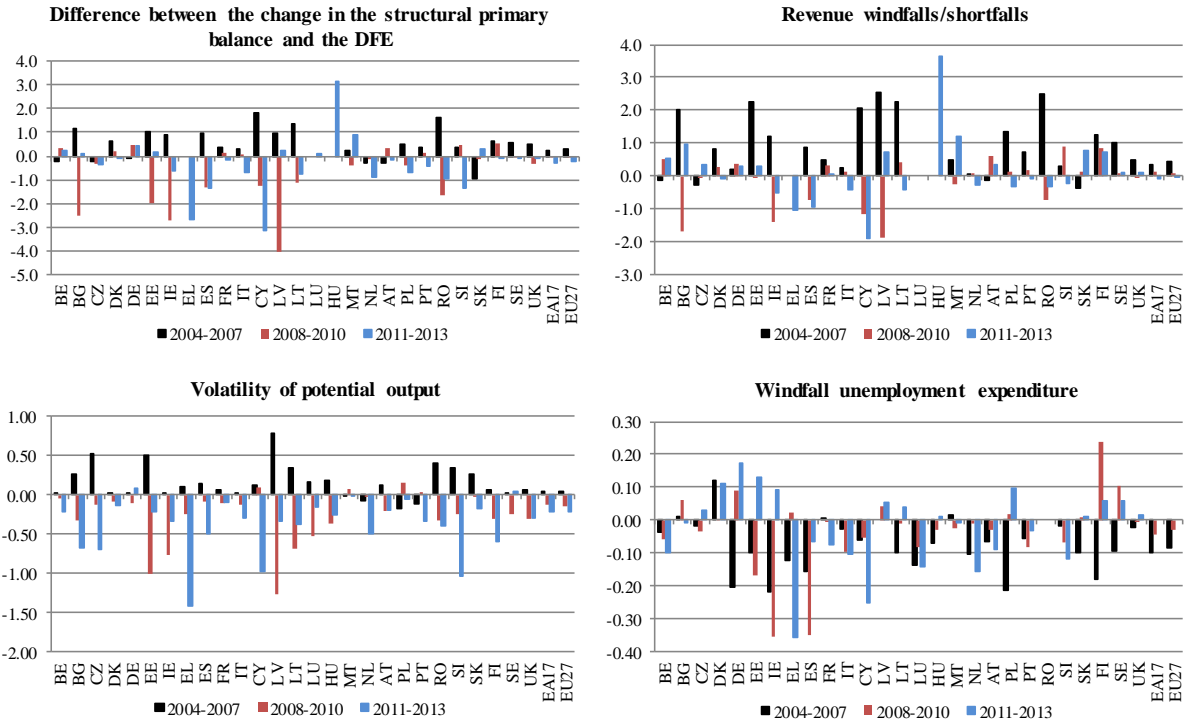
Table 1 also shows that the discretionary fiscal effort and the change in the structural primary balance broadly coincide on average for the period 2004-2013, though with significant variations across countries and time periods. In principle, it would be expected that the differences between the two indicators are generally less pronounced in "normal times" than they are at the present juncture. However, this assessment hardly applies to the pre-crisis years. There are good reasons for not to qualify them as "normal times", but as "boom" ones in view of the overheating in some Member States and the sizeable accumulation of

imbalances. These led to large revenue windfalls, the temporary nature of which was unveiled by the crisis. In this connection, the discretionary fiscal effort would have helped better assess the fiscal stance in good times as well.

3.2 Breakdown of the difference

Figure 1 displays the contribution of the main explanatory factors of the difference between the change in the structural primary balance and the discretionary fiscal effort by subsample. On average, positive revenue windfalls feeding the structural balance were registered annually during the expansionary phase up until 2007. However, this picture reverts significantly as of 2008. In most cases their size diminished remarkably, with the more vulnerable countries in fact registering sizeable revenue shortfalls. For the most recent years the picture is more mixed, with some countries registering revenue windfalls while others showing the opposite. However, the largest revenue shortfalls are registered in countries heavily hit by the crisis and embarked in a protracted period of rebalancing and deleveraging.

Figure 1. Contributions to the difference between the change in the structural primary balance and the discretionary fiscal effort



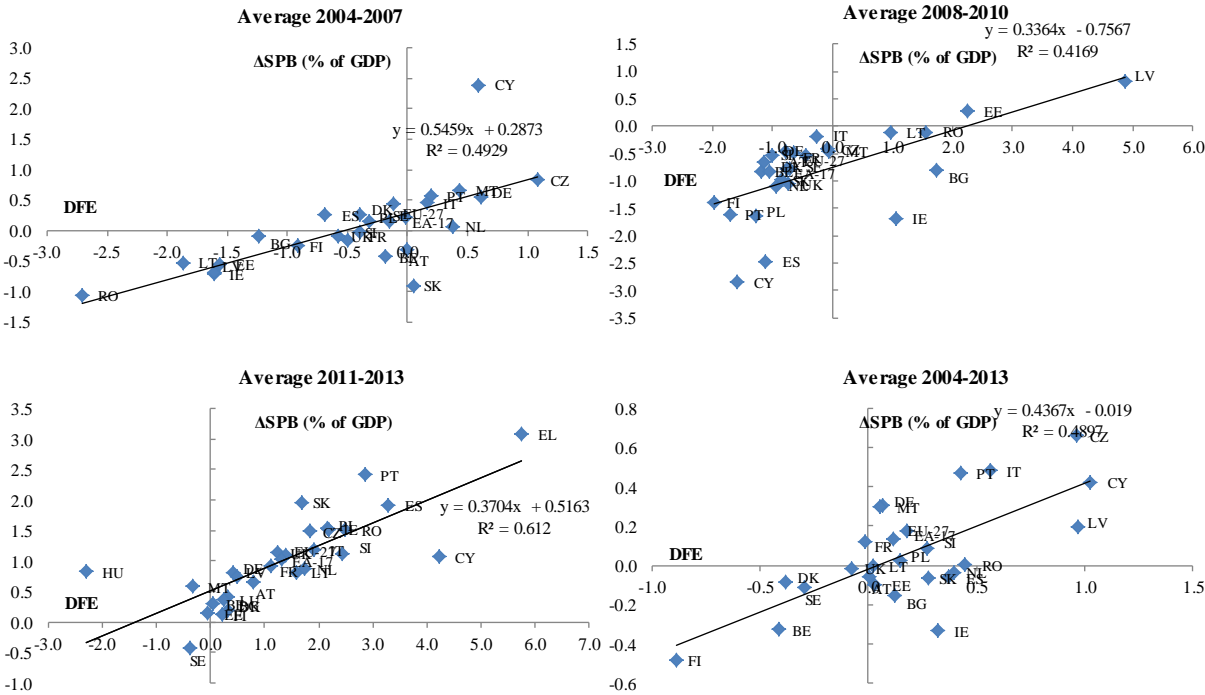
Source: AMECO (Commission Spring 2013 forecast), authors' calculations.

Albeit to a lesser extent, the volatility of potential output with respect to its medium-term average growth is another major factor explaining the difference between the two indicators. While its contribution is positive on average for the pre-crisis period, it turns clearly negative

as of 2008. The largest negative contributions between 2008 and 2010 are registered in the Baltic countries and Ireland. However, in most of the remaining cases, the contribution of this factor is largest between 2011 and 2013, especially in Greece, Spain, Cyprus, Slovenia, and to a lesser extent, Bulgaria, the Czech Republic, Lithuania, the Netherlands and Portugal. It should be stressed, however, that the two notions of potential growth coincide over time on average, so that there is no inherent bias in the discretionary fiscal effort measure.

The contribution of windfall/shortfall unemployment expenditure is not as sizeable as the former two other components. Leaving aside its size, its most remarkable feature is that it is largely negative on average in the three subsamples. However, the most negative values for this factor are registered after 2008 in Ireland, Greece, Spain, Cyprus and the Netherlands and are associated to the intense job destruction observed in these economies in recent years (beyond what would have been expected given growth developments).

Figure 2. Relationship between the change in the structural primary balance and the discretionary fiscal effort



Source: AMECO (Commission Spring 2014 forecast), authors' calculations.

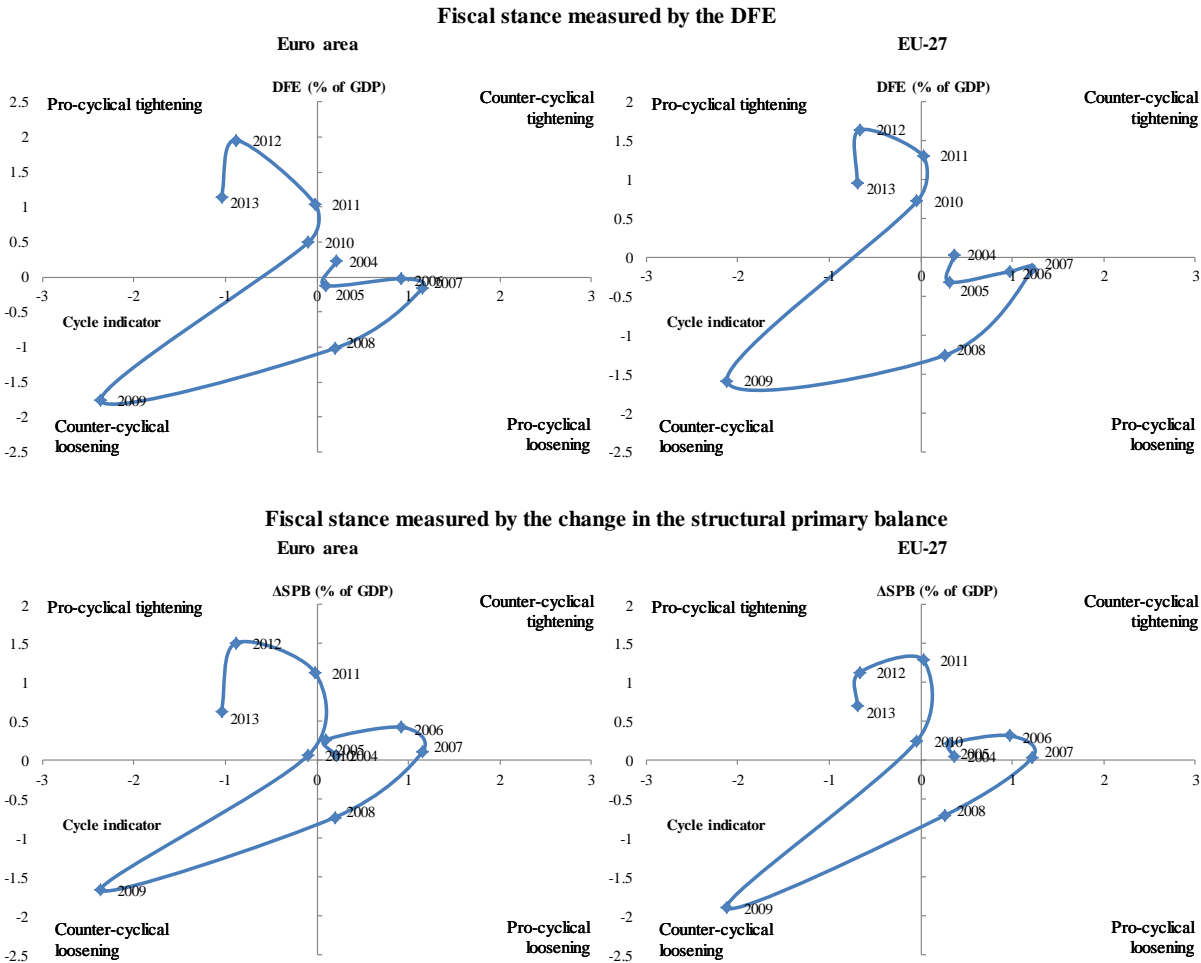
Overall, the change in the structural primary balance and the discretionary fiscal effort display notable correlation. For the entire sample the simple correlation coefficient amounts to around 0.7. The correlation is stronger before the crisis period than thereafter, especially between 2011 and 2013. In this period most of the countries adopt consolidation strategies but the degree of fiscal tightening shown by the discretionary fiscal effort often exceeds that stemming from the change in the structural primary balance (Figure 2). The correlation

between the two indicators also differs between the group of countries that underwent a more pronounced boom and bust cycle (Cyprus, Ireland, Italy, Latvia, Lithuania, Malta, Portugal, Romania, Slovenia and Slovakia, Spain and the United Kingdom) and the group gathering other economies. The correlation between the two indicators is significantly stronger in the latter group, than in the former group, suggesting that the information brought by the discretionary fiscal effort is more significant when economies experience large shocks.

3.3 Discretionary fiscal effort and cyclical position

Figure 3 shows the evolution of the fiscal stance as measured by both the discretionary fiscal effort and the change in the structural primary balance in relation with the economic cycle for the euro area and for the EU-27. The same relationship between the economic cycle and the fiscal stance by country as measured by the discretionary fiscal effort is shown in Annex 2. These charts allows a rough characterisation of the fiscal path as either 'pro-cyclical' (a positive fiscal effort in bad times, or a negative effort in good times), 'counter-cyclical' (the two opposite situations), or possibly close to neutral. To do this requires some simplifying assumptions. In particular, we construct a summary indicator of business conditions combining information from the level and the change in the output gap (box 1).

Figure 3. The fiscal stance and the cycle



Source: AMECO (Commission Spring 2014 forecast), authors' calculations.

According to this approach, the fiscal stance as measured by the discretionary fiscal effort may be said to have been close to neutrality over the pre-crisis years of 2004-2007 in the context of increasingly favourable conditions (in the detail, there was a modicum of initial countercyclical tightening in 2004 in the euro area, and mild pro-cyclical loosening in the mid-2000s for the EU-27). This suggests that overall the 'good times' were not or not much taken advantage of for strengthening budgetary positions (although, as Annex 2 shows, specific country stories differ). By contrast, the change in the structural primary balance would suggest a countercyclical tightening taking place over the same period.

With the 'Great Recession' of 2008-2009 the fiscal stance changed gear dramatically. The stimulus packages adopted to counter the effects of the pronounced recession in 2009 led to a counter-cyclical fiscal loosening. However, as part of a strategy of gradual consolidation amplified by the outbreak of the sovereign debt crisis in the euro area especially affecting several 'peripheral' economies, most governments started to implement significant consolidation measures as of 2010. While this initially occurred against the background of a mixed economy, as economies bottomed out of the recession in 2010-2011, this strategy generally evolved into significant pro-cyclical tightening in 2012-2013. The overall impression is that fiscal policies have been conducted in a somewhat stop and go fashion, without much counter-cyclical action, except in the early stage of the crisis.

Despite some differences across countries, this picture is broadly observed in most countries, namely Belgium, the Czech Republic, Spain, France, Italy, Cyprus, the Netherlands, Portugal, Slovenia, Slovakia, Finland and the United Kingdom (see Annex 2). Ireland shows a similar pattern too, although the sharp pro-cyclical tightening took place in 2008, instead of 2009 as observed in other cases, due to the earlier effects of the banking crisis derived from the earlier collapse of the housing market. In turn, due to data availability we can only offer this relationship for Greece for the period 2011-2013, when a pronounced pro-cyclical tightening derived from the requirements of the macroeconomic adjustment programme is detected.

Box 1 – Cyclical conditions: a summary proxy

In order to relate the direction of fiscal policy to the business cycle, we use a summary indicator of business conditions. This raises methodological issues as there is no universally agreed metric of cyclical conditions. In principle, some measure of the output gap is the natural starting point (see, for instance, Galí and Perotti, 2003, or Alesina et al., 2008). The level of the output gap may however turn out to be an insufficient or even possibly misleading gauge at times. The literature suggests that the change in the output gap may offer a complementary and more robust signal (see European Commission, 2006, Part IV, or OECD, 2003). Accordingly we choose to rely on an ameliorated output gap approach, with a composite indicator giving equal weights to the output gap and the change in the output gap.

Specifically, a summary indicator of cyclical conditions for each country-period is generated by the following systematic procedure. First, the difference between the output gap and its centred average is divided by its standard deviation. This gives a 'normalised' output gap,

which generally falls (but not always) between [-2 ; +2]. Second, the same operation is repeated for the series of the change in the output gap. These 'normalisations' of both the level and change in the output gap are performed over a suitably long period (1980-2013 or the largest available time span in AMECO for potential output) in order to avoid being over-influenced by the recent crisis period. Third, the composite indicator is computed as the simple average of the normalised output gap level and the normalised change in the output gap. This yields a composite indicator generally within [-2 ; +2] but which can fall outside this band in unusual circumstances.

This method of evaluating the economic outlook is a shortcut allowing us to study the fiscal stance across the panel. It is not seen as a substitute for the more detailed conjunctural analysis that could be warranted in each practical case. The method can be charged with an over-reliance on uncertain output gap estimates. Still, one needs a reasonably simple systematic method in a panel study of this kind. Besides, as argued above, using a combination of the level and change in the output gap is likely to be a significant improvement over using the output gap level only. Reasons are that the change in the output gap is typically less revised than the level, and that mixing the two signals is conducive to a more balanced assessment of the economy at turning points (when the boom morphs into a downturn or when recoveries take hold).

4. Estimating fiscal multipliers

This section uses the natural properties of the discretionary fiscal effort as an indicator of the fiscal stance to estimate, based on the panel data analysed in section 3, the short-term impact on activity of fiscal policy, as well as its dependence on the composition of fiscal shocks and the state of the economy.

4.1 Methodology

The most direct way to empirically evaluate short-term (1-year) fiscal multipliers is to estimate the following specification:

$$y_{it} = m_y DFE_{it} + X_{it} + c_i + \varepsilon_{it} \quad (2)$$

where y_{it} is real annual output growth for country i and year t , X_{it} is a vector of control factors, c_i are country-fixed effects, and m_y stands for the (one-year) output multiplier⁷.

The above specification is estimated for an unbalanced panel comprising 27 EU Member States over the period 2004-2013, using the data presented in previous sections.

In multiplier regressions of this kind, a typical problem when relying on the structural balance as an indicator of fiscal shocks, is the potential endogeneity to economic developments. This essentially stems from the large revenues windfalls and shortfalls associated with good and

⁷ In order to strictly preserve the definition of the multiplier as the euro change in output per euro of ex ante relaxation of the budget balance, the DFE is multiplied by a factor Y_t/Y_{t-1} when entering the above regression.

bad times respectively, which induce a correlation between changes in the structural balances and output growth that biases the estimated value of the multiplier. In addition, the potentially pro-cyclical nature of potential growth is another possible source of endogeneity.

The discretionary fiscal effort is much less exposed than the structural balance to these endogeneity issues, because it relies on a bottom-up approach on the revenue side, and because it uses a smoother notion of potential growth that is less likely to exhibit procyclicality. That makes it a natural candidate to serve to identify fiscal shocks in a multiplier regression, including using a basic OLS framework. Still, as there may remain a degree of endogeneity in the discretionary fiscal effort through its reliance on smoothed potential growth, the more robust estimates of an instrumental variables (TSLS) framework are also examined. The latter uses as instruments lagged GDP growth rates, discretionary revenue measures (in percent of past GDP), and the growth rate of general government expenditure.

Another potential source of endogeneity could also arise if fiscal policy measures responded contemporaneously to the prevailing economic conditions, i.e. a systematic fiscal policy reaction function wherein contemporaneous GDP growth entered as an argument. However, it is not always clear that such contemporaneous reaction can be found empirically (see Born and Müller, 2012; Beetsma et al, 2009). In any case, should there be some degree of contemporaneous reaction of fiscal policy, instrumental variables would offer more consistent estimates.

Cross-section fixed effects are used in all estimations in order to account for differing trend growth rates. The US GDP growth rate is included in all specifications in order to control for common economic factors, in particular extra-EU foreign demand. Changes in short-term nominal interest rates, although sometimes only borderline significant, were included so as to control for monetary policy shocks.

4.2 Results

The fiscal multipliers obtained in the framework described above are shown in Table 4. The average short-run multiplier is estimated between 0.8-0.9,⁸ with a 95% uncertainty range of about +/-0.2. Such values might be seen as relatively middle-of-the-road, in comparison with previous empirical evidence, which however is very much dispersed (see for instance Coenen *et alii*, 2012; Barrell *et alii*, 2012; or European Commission, 2012). Our results are also broadly consistent with model-based simulations of the QUEST model (see Roeger and in't Veld, 2010, which also highlights the composition and state-dependency of the multipliers).

Revenue and expenditure multipliers can be estimated by using as fiscal shocks the revenue and expenditure sides of the DFE in isolation, i.e. the first and second term, respectively, of equation (2). Hence, our fiscal multipliers to revenue shocks are obtained in accordance to a narrative approach. Conversely, by construction, expenditure multipliers gauged with the DFE would be methodologically closer to those obtained under a top-down approach, albeit with refinements as discussed earlier.

⁸ The OLS estimate is at 0.8 and the TSLS at 0.9. When including a lagged dependent variable in the OLS, the first-year multiplier falls to 0.6 but given the lagged response, the 'cumulated multiplier' stands at 0.75.

Table 4. Estimated output multipliers

| | OLS | OLS | OLS | OLS | TOLS | TOLS | TOLS | TOLS |
|------------------|--|-------------------|--------------------|--------------------|--------------------|--------------------|--------------------|-------------------|
| dfe_t | -0.81*** (0.13) | | -0.58*** (0.13) | | -0.88*** (0.16) | | -0.90*** (0.17) | |
| drm_t | | -0.47** (0.19) | | -0.33* (0.17) | | -0.40*** (0.14) | | -0.34** (0.15) |
| dfe_g_t | | 0.99*** (0.15) | | 0.73*** (0.16) | | 1.33*** (0.23) | | 1.42*** (0.22) |
| y_{t-1} | | | 0.23*** (0.05) | 0.22*** (0.06) | | | | |
| y_t^{US} | 1.37*** (0.14) | 1.35*** (0.14) | 1.28*** (0.15) | 1.27*** (0.15) | 1.43*** (0.13) | 1.47*** (0.13) | 1.39*** (0.13) | 1.40*** (0.13) |
| Δi_{t-1} | -0.16 (0.12) | -0.20* (0.11) | -0.37*** (0.10) | -0.39*** (0.09) | | | -0.16 (0.11) | -0.25** (0.10) |
| const | -0.58** (0.24) | -0.58** (0.24) | -0.98*** (0.18) | -0.96*** (0.18) | -0.91 (0.58) | -0.92 (0.57) | -0.88 (0.60) | -0.87 (0.60) |
| R^2 | 0.55 | 0.56 | 0.64 | 0.64 | 0.67 | 0.67 | 0.68 | 0.68 |
| No. Obs. | 238 | 238 | 238 | 238 | 240 | 240 | 238 | 238 |
| Instruments: | drm _t , g _t , y _{t-1} | | | | | | | |

Notes: The numbers in brackets are standard errors.

Variables: *dfe*: discretionary fiscal effort; *drm*: discretionary revenue measures; *dfe_g*: discretionary effort on the expenditure side; *y*: real GDP growth; y^{US} : US real GDP growth; Δi : the change in the short-term interest rate.

Both expenditure and revenue multipliers are significant and with the expected sign. Expenditure multipliers are, in absolute values about twice as large as revenue multipliers. According to the OLS specification, the expenditure multiplier is close to 1.0, whereas the revenue multiplier is around 0.5 or a bit lower. The potential contemporaneous correlation between the regressors and the residuals is, by construction, more salient for our measure of expenditure shocks, i.e. the DFE on the expenditure side. This is the reason why the estimated revenue multipliers by instrumental variables barely change with respect to the OLS specifications. However, the estimated expenditure multiplier in instrumental variables regressions increases significantly, ranging between 1.3 and 1.4.

The estimated expenditure multipliers fall comfortably within the range of values obtained in other empirical studies (see Romer and Bernstein, 2009; Christiano, et al., 2011; De Castro, 2006; De Castro and Hernández de Cos, 2008; Giordano et al., 2007, among others). In turn, revenue multipliers seem also in accordance with estimates in Burriel et al. (2010) for the euro area, Biau and Girard (2005), Giordano et al. (2007), Perotti (2004) or Cloyne (2011).⁹

There is a growing acceptance that output multipliers are higher in "bad times" than in "good times". This can be for a number of reasons (see Auerbach and Gorodnichenko, 2011, 2012; Christiano, et al., 2011; Eggertson and Krugman, 2012; Blanchard and Leigh, 2013). In

⁹ Baum and Koester (2011) and Bénassy-Quéré and Cimadomo (2006) obtain higher revenue multipliers, in the latter case even exceeding 1.

particular, fiscal multipliers are deemed to be higher in an environment of weak activity, lack of room for supporting monetary policy close to the zero lower bound and tight financing constraints for private agents. Conversely, in an economy without slack the effect of expansionary spending policies are thought to be crowded out by lower private consumption or investment.

To explore this idea, we split the sample into periods that can be characterised as 'good times' versus 'bad times'. We have tried different criteria based on the output gap in order to characterise good and bad times. Results using the level of the output gap turn out to be inconclusive, but when defining good times through the change in the output gaps, a significant difference appears in multipliers.

Table 5. Output multipliers in good times ($\Delta y_{gap} \geq 0$)

| | OLS | OLS | OLS | OLS | TSLS | TSLS | TSLS | TSLS |
|------------------|-----------------------|-------------------|--------------------|--------------------|--------------------|-------------------|--------------------|-------------------|
| dfe_t | -0.58*** (0.14) | | -0.33*** (0.12) | | -0.66*** (0.17) | | -0.66*** (0.18) | |
| drm_t | | -0.24* (0.12) | | -0.09 (0.11) | | -0.64* (0.29) | | -0.14 (0.10) |
| dfe_{-g_t} | | 0.79*** (0.15) | | 0.51*** (0.11) | | 1.16*** (0.20) | | 1.21*** (0.20) |
| y_{t-1} | | | 0.20*** (0.05) | 0.18*** (0.05) | | | | |
| y_t^{US} | 0.20 (0.13) | 0.22 (0.13) | 0.20 (0.20) | 0.21* (0.12) | 0.22 (0.15) | 0.33** (0.17) | 0.23 (0.15) | 0.31* (0.16) |
| Δi_{t-1} | 0.02 (0.12) | -0.03 (0.11) | -0.11* (0.06) | -0.15*** (0.05) | | | 0.02 (0.13) | -0.10 (0.11) |
| const | 3.29*** (0.34) | 3.22*** (0.31) | 2.79*** (0.35) | 2.77*** (0.35) | 2.36*** (0.60) | 2.21*** (0.66) | 2.36*** (0.60) | 2.21*** (0.69) |
| R^2 | 0.15 | 0.19 | 0.40 | 0.41 | 0.65 | 0.63 | 0.65 | 0.63 |
| No. Obs. | 141 | 141 | 141 | 141 | 142 | 142 | 141 | 141 |
| Instruments: | drm_t, g_t, y_{t-1} | | | | | | | |

Note: The numbers in brackets are standard errors.

Variables: dfe : discretionary fiscal effort; drm : discretionary revenue measures; dfe_g : discretionary effort on the expenditure side; y : real GDP growth; y^{US} : US real GDP growth; Δi : the change in the short-term interest rate.

Using this approach, Table 5 presents output multipliers for periods when the change in the output is positive whereas Table 6 does so for 'bad times'. Table 5 shows that fiscal multipliers tend to be lower than average in good times, with revenue multipliers still positive but close to non-significant, contrary to what happens with the whole sample. By contrast, Table 6 unveils that overall fiscal multipliers are higher when the change in the output gap is negative, i.e. actual growth falls below potential. In this latter case, such increase is explained by the higher revenue multipliers, as expenditure ones do not show significantly different values from those in Table 4.

Table 6. Output multipliers in bad times ($\Delta y_{gap} < 0$)

| | OLS | OLS | OLS | OLS | TSLS | TSLS | TSLS | TSLS |
|------------------|-----------------------|--------------------|--------------------|--------------------|--------------------|-------------------|--------------------|-------------------|
| dfe_t | -0.84*** (0.22) | | -0.46** (0.22) | | -1.07*** (0.21) | | -1.11*** (0.21) | |
| drm_t | | -0.84*** (0.24) | | -0.38 (0.24) | | -0.64** (0.29) | | -0.63** (0.30) |
| dfe_g_t | | 0.84*** (0.26) | | 0.49* (0.27) | | 1.31*** (0.33) | | 1.36*** (0.32) |
| y_{t-1} | | | 0.56*** (0.18) | 0.56*** (0.18) | | | | |
| y_t^{US} | 1.26*** (0.20) | 1.26*** (0.20) | 1.01*** (0.18) | 1.00*** (0.18) | 1.32*** (0.17) | 1.30*** (0.17) | 1.37*** (0.18) | 1.34*** (0.18) |
| Δi_{t-1} | 0.14 (0.26) | 0.14 (0.25) | -0.70* (0.35) | -0.71* (0.35) | | | 0.15 (0.22) | 0.14 (2.94) |
| $dfe * y_t^{US}$ | | | | | | | | |
| const | -1.97*** (0.11) | -1.97*** (0.11) | -2.57*** (0.21) | -2.58*** (0.21) | -1.06 (0.72) | -1.07 (0.67) | -1.13 (0.70) | -1.15* (0.66) |
| R^2 | 0.68 | 0.68 | 0.72 | 0.72 | 0.77 | 0.76 | 0.77 | 0.75 |
| No. Obs. | 97 | 97 | 97 | 97 | 98 | 98 | 97 | 97 |
| Instruments: | drm_t, g_t, y_{t-1} | | | | | | | |

Note: The numbers in brackets are standard errors.

Variables: dfe : discretionary fiscal effort; drm : discretionary revenue measures; dfe_g : discretionary effort on the expenditure side; y : real GDP growth; y^{US} : US real GDP growth; Δi : the change in the short-term interest rate.

4.3 Caveats

The insights presented in this section are generally not overly surprising, but the estimates have to be taken with care as they are based on a very short time span and accordingly rely on a small number of observations.

Some other caveats should be borne in mind too. In general, the estimated magnitude of fiscal multipliers significantly depends on the composition of the fiscal shocks. The level of granularity needed to account for the composition-dependency found in the literature goes beyond the aggregate categories of expenditure and revenues used here. While in principle it would be possible to break down further the discretionary fiscal effort, we do not attempt such extension in this work because we do not have the necessary breakdown for discretionary revenue measures.

Moreover, the multipliers presented above should be seen as average values over EU countries. They are calculated over twenty-seven countries enjoying differing characteristics and expected responses to policy moves. Fiscal multipliers are generally thought to be somewhat country-dependent and the panel approach can only deliver an average value. In an extension to the basic specifications reported above, we have tried to identify differences in multipliers stemming from the degree of openness, one of the most-widely acknowledged origins of country differences (Barrell *et alii*, 2012). The results reported in Annex 3 are in

accordance with the assumption that multipliers tend to decrease with openness, though the coefficients are generally not significant at conventional levels.

It may also be worth recalling that one-offs and other temporary measures are netted out to calculate the DFE, for which the fiscal shocks used to estimate the multipliers are either permanent or relatively long-lasting. As permanent fiscal shocks are deemed to entail lower multipliers than transitory ones, the estimates presented here might be downward biased when compared to other papers.

5. Conclusions

The comparison between the change in the structural primary balance and the discretionary fiscal effort suggests that the former yields a more optimistic view of the orientation of fiscal policy in booms, while it tends to underestimate the fiscal effort in recessions. Relying on enacted measures on the revenue side and on medium-term potential growth on the expenditure side, the discretionary fiscal effort seems to yield a better evaluation of the underlying orientation of fiscal policy when economies are exposed to shocks that are ill-captured by standard estimates of cyclical tax and spending elasticities, large changes in interest payments, or sharp revisions in potential growth.

The empirical part of this paper confirms that the description of fiscal policies is to an important extent influenced by the choice of approach. In particular, the discretionary fiscal effort suggests that, with exceptions, fiscal policy in the EU has been conducted in a more stop and go and pro-cyclical fashion over the past ten years than suggested by traditional indicators. In recent years, in a context when most EU countries are tightening fiscal policy, the actual consolidation effort appears to be underestimated in many countries when assessed on the sole basis of the structural balance. Conversely, during the booming years that preceded the crisis, the structural balance tended to overestimate the progress on fiscal consolidation.

Using the discretionary fiscal effort, the average short-run fiscal multiplier is estimated at 0.8-0.9, with some notable differentiation between aggregate expenditure and revenue shocks. We also find some differentiation between good and bad times as defined by a positive (respectively negative) change in the output gap, with multipliers being significantly lower in the former case. Significant limitations of our empirical work, however, relate to the relatively limited time span, the uncertainty in parts of the data (notably the yields of tax measures in early years of the panel), and the panel approach which only allows us to estimate an average, non-country dependent multiplier.

References

- Alesina, A. and R. Perotti (1995), Fiscal expansions and fiscal adjustments in OECD countries, *NBER Working Paper*, No W5214.
- Alesina, A., F.R. Campante and G. Tabellini (2008), Why is fiscal policy often procyclical?, *Journal of the European Economic Association*, 6, pp. 1006–1036.
- Ardagna, S. (2004), Fiscal stabilisations: when do they work and why?, *European Economic Review*, Vol. 48, No 5, pp.1047–1074.
- Auerbach A. J. and Y. Gorodnichenko (2011), Fiscal Multipliers in Recession and Expansion, NBER Working Papers 17447.
- Auerbach A. J. and Y. Gorodnichenko (2012), Measuring the output responses to fiscal policy, *American Economic Journal: Economic Policy*, 4, 127.
- Barrell R., D. Holland and I. Hurst (2012), Fiscal consolidation: Part 2. Fiscal multipliers and fiscal consolidations, *OECD Economics Department Working Papers*, N°933.
- Baum, A. and G.B. Koester (2011), The impact of fiscal policy on economic activity over the business cycle – evidence from a threshold VAR analysis, Deutsche Bundesbank. Discussion Paper - Economic Studies No 3/2011.
- Beetsma, R. and M. Giuliadori (2008), On the relationship between fiscal plans in the European Union: An empirical analysis based on real-time data, *Journal of Comparative Economics*, 36.
- Beetsma, R., M. Giuliadori and F. Klaassen (2009), Temporal aggregation and SVAR identification with an application to fiscal policy, *Economics Letters*, 105, pp. 253-255.
- Bénassy-Quéré, A. and J. Cimadomo (2006), Changing patterns of domestic and cross-border fiscal policy multipliers in Europe and the US, CEPII Working Paper 2006-24.
- Biau, O. and E. Girard (2005), Politique budgétaire et dynamique économique en France: l'approche VAR structurel, *Économie et Prévision* 169–171, 1–24.
- Blanchard O. and D. Leigh (2013), Growth forecast errors and fiscal multipliers, *American Economic Review*, 103(3): 117-20.
- Born, B. and G.J. Müller (2012), Government spending in quarterly and annual time series, *Journal of Money, Credit and Banking*, 44 (2-3), pp. 507-517.
- Burriel, P., F. de Castro, D. Garrote, E. Gordo, J. Paredes and J.J. Pérez (2010), Fiscal policy shocks in the euro area and the US: an empirical assessment, *Fiscal Studies* 31(2), 251–285.
- Christiano, L., M. Eichenbaum and S. Rebelo (2011), When is the Government Spending Multiplier Large?, *Journal of Political Economy* 119(1), 78-121.

Coenen G., C. Erceg, C. Freedman, D. Furceri, M. Kumhof, R. Lalonde, D. Laxton, J. Lindé, A. Mourougane, D. Muir, S. Mursula, C. de Resend, J. Roberts, W. Roeger, S. Snudden, M. Trabandt and J. van Veld (2012), Effects of fiscal stimulus in structural models, *American Economic Review, Macroeconomics*, 4/1: 22-68.

D'Auria, F. C. Denis, K. Havik, K. Mc Morrow, C. Planas, R. Raciborski, W. Röger and A. Rossi (2010), The production function methodology for calculating potential growth rates and output gaps", *European Economy, Economic Papers*, 420.

de Castro, F. (2006), The macroeconomic effects of fiscal policy in Spain, *Applied Economics*, 38, 913-924.

de Castro, F and P. Hernández de Cos (2008), The economic effects of fiscal policy: the case of Spain, *Journal of Macroeconomics*, 30, 1005-1028.

Eggertson G. and P. Krugman (2012), Debt, deleveraging and the liquidity trap, *Quarterly Journal of Economics*, pp.1469-1513.

Eschenbach F. and L. Schuknecht (2002) Fiscal balances and asset prices, ECB Working Paper No. 141

European Commission (2006), Public Finances in EMU — 2006, *European Economy*, N°3/2006.

European Commission (2010), Report on Public Finances in EMU — 2010, *European Economy*, N°3/2009.

European Commission (2012), Report on Public Finances in EMU, *European Economy*, N°4/2012.

European Commission (2013), Report on Public Finances in EMU, *European Economy*, N°4/2013.

Favero, C.A. and F. Giavazzi (2010), Reconciling VAR-based and Narrative Measures of the Tax-Multiplier, *CEPR Discussion Papers* No 7769.

Galí, J. and R. Perotti (2003), Fiscal policy and monetary integration in Europe, *Economic Policy*, 18, pp. 533–572.

Giordano, R., S. Momigliano, S. Neri and R. Perotti (2007), The effects of fiscal policy in Italy: Evidence from a VAR model, *European Journal of Political Economy*, 23, pp. 707–733.

Guajardo, J., D. Leigh and A. Pescatori, (2011) Expansionary Austerity: New International Evidence, IMF Working Paper No. 11/158

International Monetary Fund (2004), *World Economic Outlook*, September 2004.

International Monetary Fund, (2010), Chapter 3 *World Economic Outlook*, October 2010.

Kumar, M., D. Leigh and A. Plekhanov, (2007), Fiscal Adjustments: Determinants and Macroeconomic Consequences, IMF Working Paper No. 07/178.

Lendvai J., L. Moulin and A. Turrini, (2011), From CAB to CAAB? Correcting Indicators of Structural Fiscal Positions for Current Account Imbalances, *European Economy, Economic Papers* No. 442.

Morris, R., C. Rodrigues Braz, F. de Castro, S. Jonk, J. Kremer, S. Linehan, M.R. Marino, C. Schalck and O. Tkacevs (2009). Explaining government revenue windfalls and shortfalls: an analysis of the revenue data for selected EU countries, ECB Working Paper Series No. 1114, November.

Mourre, G., G.M. Isbasoiu, D. Paternoster and M. Salto (2013), The cyclically adjusted budget balance used in the EU fiscal framework: an update, *European Economy, Economic Papers*, 478.

OECD (2003), Fiscal stance over the cycle: the role of debt, institutions and budget constraints. *Economic Outlook* 74.

Perotti, R. (2004). Estimating the effects of fiscal policy in OECD countries, Proceedings, Federal Reserve Bank of San Francisco.

Princen S., G. Mourre, D. Paternoster and G.M. Isbasoiu (2013), Discretionary tax measures: pattern and impact on tax elasticities, *European Economy, Economic papers*, N°499, May.

Ramey V.A. (2011), Identifying Government Spending Shocks: It's all in the Timing, *The Quarterly Journal of Economics*, Vol. 126(1), pp. 1-50.

Roeger W. and J. in't Veld (2010), Fiscal stimulus and exit strategies in the EU: a model-based analysis, *European Economy, Economic Papers*, N°426.

Romer, C. and J. Bernstein (2009), The Job Impact of the American Recovery and Reinvestment Plan, http://otrans.3cdn.net/45593e8ecbd339d074_13m6bt1te.pdf.

Romer, C. and D.H. Romer (2010), The Macroeconomic Effects of Tax Changes: Estimates Based on a New Measure of Fiscal Shocks, *American Economic Review*, 100, 763-801

Turrini A. (2008), Fiscal policy and the cycle in the Euro Area: The role of government revenue and expenditure, *European Economy, Economic Papers* No 323.

Annex 1. Analytical decomposition of the difference between the change in the structural balance and the discretionary fiscal effort

To recall, the discretionary fiscal effort is defined as:

$$DFE_t = DFE_t^R + DFE_t^G = \frac{N_t^R}{Y_t} - \frac{(\Delta E_t - pot.E_{t-1})}{Y_t} \quad (A1)$$

with N^R the budgetary impact of revenue measures in year t , E_t adjusted general government expenditure adjusted and pot is medium-term nominal potential growth.

The structural balance is the cyclically-adjusted balance corrected for one-offs and other temporary measures¹⁰:

$$SB_t = R_t - G_t - \left[(\rho_0^r - 1) \frac{R_0}{Y_0} - (\rho_0^g - 1) \frac{G_0}{Y_0} \right] OG_t \quad (A2)$$

where R_t and G_t are general government revenues and expenditure respectively, both adjusted for one-offs and other temporary measures, $BAL_t = R_t - G_t$ is the general government balance, and OG_t is the output gap. The parameters ρ_0^r and ρ_0^g are the cyclical revenue and expenditure elasticities. Equation (A2) can also be written: $SB_t = BAL_t - \varepsilon \cdot OG_t$ where $\varepsilon = (\rho_0^r - 1) \frac{R_0}{Y_0} - (\rho_0^g - 1) \frac{G_0}{Y_0}$ is the semi-elasticity of the budget balance to the output gap.¹¹

The change in the structural balance (ΔSB) can be decomposed into a contribution from the revenue side (ΔSBR) and a contribution from the expenditure side (ΔSBG).

The revenue contribution can be expressed as:

$$\Delta SB_t^R = \frac{R_t}{Y_t} - \frac{R_{t-1}}{Y_{t-1}} - (\rho_0^r - 1) \frac{R_0}{Y_0} (OG_t - OG_{t-1})$$

or equivalently

$$\Delta SB_t^R = \frac{R_t}{Y_t} - \frac{R_{t-1}}{Y_{t-1}} - (\rho_0^r - 1) \frac{R_0}{Y_0} (y_t - y_t^*) \quad (A3)$$

where y_t and y_t^* denote the actual and potential GDP growth rates, respectively.

And the expenditure contribution is similarly:

$$\Delta SB_t^G = - \left(\frac{G_t}{Y_t} - \frac{G_{t-1}}{Y_{t-1}} \right) + (\rho_0^g - 1) \frac{G_0}{Y_0} (y_t - y_t^*) \quad (A4)$$

¹⁰ Throughout the calculations, we assume that the output gap is sufficiently small that terms of second order can be neglected as compared to first-order terms. To simplify expressions, we do not explicitly write the adjustment for one offs.

¹¹ In the current EU methodology, the weights used to calculate the cyclical budgetary semi-elasticity are time invariant and obtained as the 10-average average of tax-revenues and expenditure-to-GDP ratios between 2002 and 2011 (denoted by the subscript 0). See Mourre *et alii* (2013).

On the revenue side:

The revenue contribution to the difference between ΔSB and the DFE is the difference between expression (A3) and $DFE_t^R = \frac{N_t^R}{Y_t}$:

$$\Delta SB_t^R - DFE_t^R = \left(\frac{R_t}{Y_t} - \frac{R_{t-1}}{Y_{t-1}} - \frac{N_t^R}{Y_t} \right) - (\rho_0^r - 1) \frac{R_0}{Y_0} (y_t - y_t^*) \quad (A5)$$

To give a simpler form to this expression, let's define the actual (i.e., observed, by contrast to the average) semi-elasticity of revenues (after netting out discretionary measures) ρ_t^r as:

$$\rho_t^r = \frac{(R_t - N_t^R - R_{t-1})/R_{t-1}}{(Y_t - Y_{t-1})/Y_{t-1}}, \text{ or equivalently } \left(\frac{R_t}{Y_t} - \frac{R_{t-1}}{Y_{t-1}} - \frac{N_t^R}{Y_t} \right) = (\rho_t^r - 1) y \frac{R_{t-1}}{Y_{t-1}}$$

Plugging this expression into (A5) and rearranging yields the following decomposition for the difference between ΔSB and the DFE on the revenue side:

$$\Delta SB_t^R - DFE_t^R = (\rho_t^r - \rho_0^r) y \frac{R_0}{Y_0} + (\rho_0^r - 1) y_t^* \frac{R_0}{Y_0} + (\rho_t^r - 1) y_t \left(\frac{R_{t-1}}{Y_{t-1}} - \frac{R_0}{Y_0} \right) \quad (A6)$$

The three terms in (A6) have a clear economic meaning:

- i) The first term in the right hand side is an approximate measure of revenue windfalls/shortfalls¹², which shows up as the difference between the actual and average elasticities. Empirically, this is by far the largest contributor to the difference on the revenue side.
- ii) The second term reflects a possible inertial increase/decrease in the revenue-to-GDP ratio linked in the event of a non-unitary (average) elasticity of revenues to output. In general, this is small as most values of ρ_0^r do not much differ from unity.
- iii) The last term is a residual term that appears when the actual share of expenditure departs from the share in the base year. In practice, this is quantitatively small as well.

On the expenditure side:

The expenditure contribution to the difference between ΔSB and the DFE is:

$$\Delta SB_t^g - DEF_t^g = - \left(\frac{G_t}{Y_t} - \frac{G_{t-1}}{Y_{t-1}} \right) + (\rho_0^g - 1) \frac{G_0}{Y_0} (y_t - y_t^*) + \frac{G_t - I_t - U_t}{Y_t} - (1 + pot) \frac{G_{t-1} - I_{t-1} - U_{t-1}}{Y_t} \quad (A7)$$

Notice that in (A7) total unemployment expenditure, instead of non-discretionary unemployment expenditure is deducted. By rearranging terms (A7) can be written as:

¹² See Morris et al. (2009) for a more precise definition of revenue windfalls/shortfalls.

$$\Delta SB_t^g - DEF_t^G = (y - pot) \frac{G_{t-1}}{Y_{t-1}} + (\rho_0^g - 1) \frac{G_0}{Y_0} (y_t - y_t^*) - \Delta \frac{I_t}{Y_t} - \frac{\Delta U_t}{Y_t} - (y_t - pot) \frac{I_{t-1} + U_{t-1}}{Y_{t-1}} \quad (A8)$$

Similarly to what we did on the revenue side, the expression can be simplified by introducing the actual (i.e. observed, by contrast to the average) unemployment expenditure elasticity

$$\rho_t^g = \frac{(U_t - U_{t-1})/G_{t-1}}{y_t - y_t^*}$$

Substituting in (A8) and assuming that the term $\rho_t^g (y_t - y_t^*) \frac{G_{t-1}}{Y_t}$ is at first order equivalent to $\rho_t^g (y_t - y_t^*)$, the following expression after some algebraic manipulation is obtained:

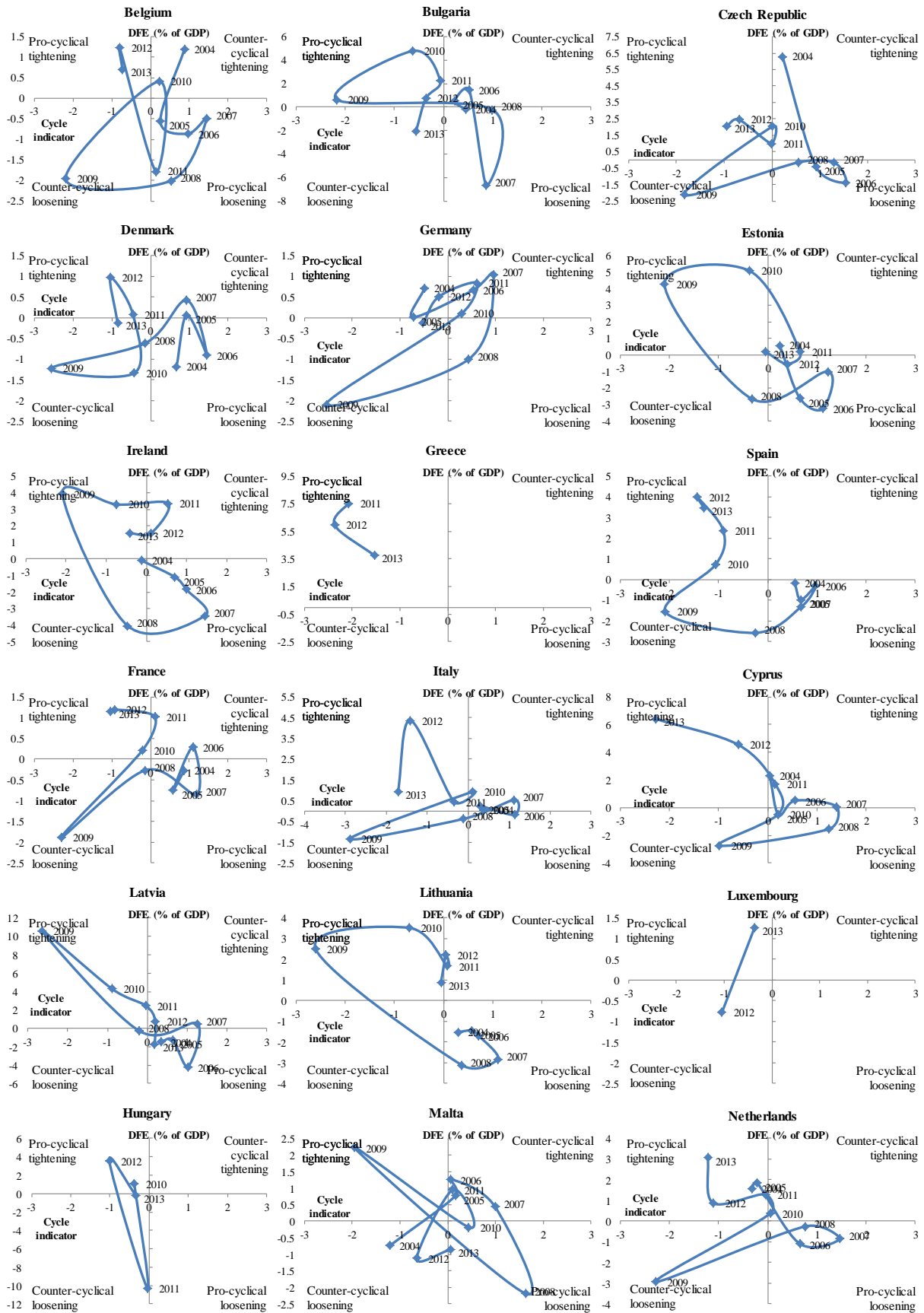
$$\begin{aligned} \Delta SB_t^g - DEF_t^G = & (\rho_0^g - \rho_t^g) \frac{G_0}{Y_0} (y_t - y_t^*) + (y_t^* - pot) \frac{G_{t-1}}{Y_{t-1}} - \Delta \frac{I_t}{Y_t} \\ & + (1 - \rho_t^g) (y_t - y_t^*) \left(\frac{G_{t-1}}{Y_{t-1}} - \frac{G_0}{Y_0} \right) - (y_t - pot) \frac{I_{t-1} + U_{t-1}}{Y_{t-1}} \end{aligned} \quad (A9)$$

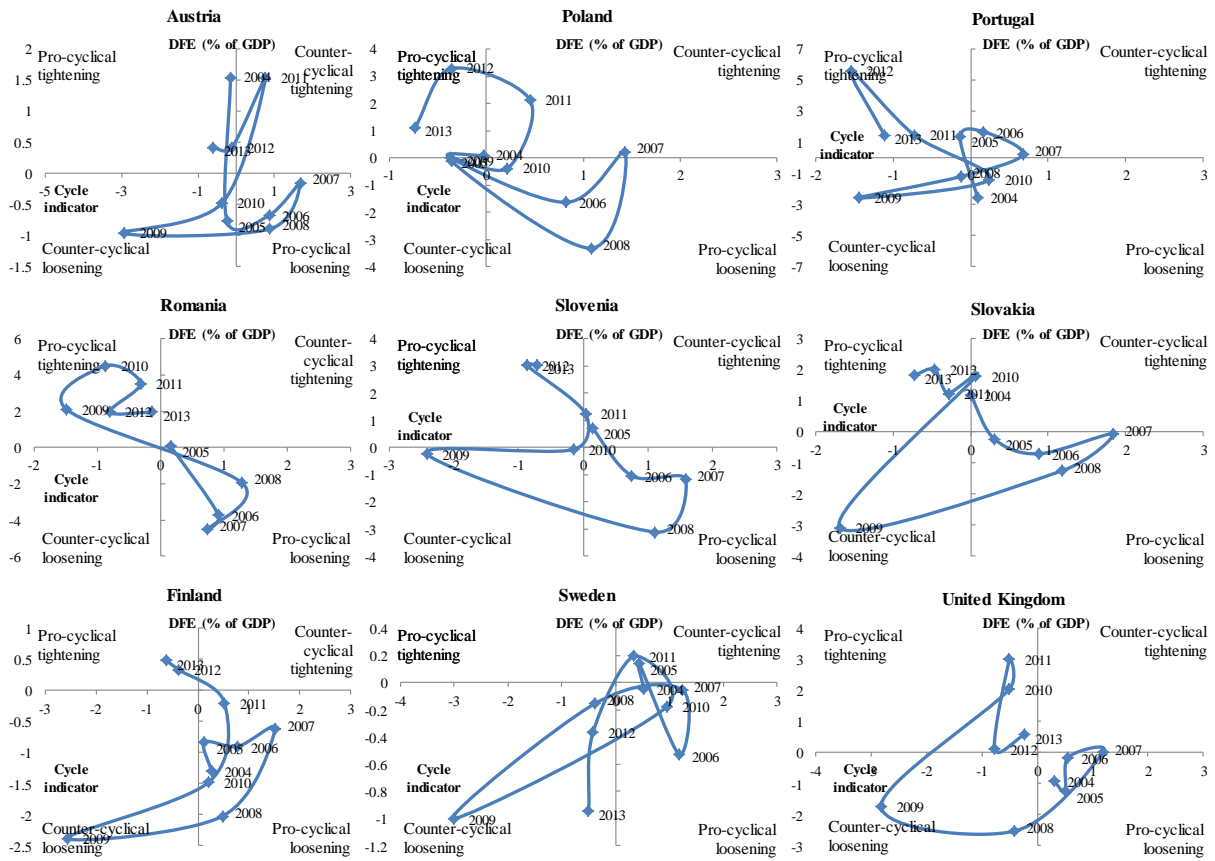
As in the case of revenues, the different terms in equation (A9) have a clear economic interpretation:

- i) The first term on the right hand side reflects the "windfalls/shortfalls" in unemployment expenditure.
- ii) The second term stems from the variability of potential growth, and reflects the gap between the usual 'annual' potential growth and the smoother notion that we adopt in the discretionary fiscal effort.
- iii) The third one merely shows the effect of the increase in interest payment expenditure. Such source of difference between both indicators is overcome by the use of the change in the cyclically adjusted primary balance (ΔSPB), instead of ΔSB .
- iv) The fourth term shows up as due to the deviation of expenditure ratios with respect to the fixed weights used in the structural balance methodology.
- v) Finally, the fifth term reflects the excess trend projection of interest and unemployment expenditure with respect to the medium-term potential growth rate.

As can be expected, the last two terms are small in practice when compared to the other three ones.

Annex 2. The fiscal stance and the cycle by country





Source: AMECO (Commission Spring 2014 forecast), authors' calculations.

Annex 3. Fiscal multipliers and degree of openness

| | OLS | OLS | OLS | OLS | TSLS | TSLS | TSLS | TSLS |
|------------------|--|--------------------|--------------------|--------------------|-------------------|-------------------|-------------------|-------------------|
| dfe_t | -1.27*** (0.34) | | -1.12*** (0.30) | | -3.12** (1.31) | | -3.12** (1.38) | |
| $dfe*open_t$ | 0.37 (0.26) | | 0.44** (0.20) | | 1.73* (1.02) | | 1.73 (1.08) | |
| drm_t | | -0.95*** (0.29) | | -0.86*** (0.27) | | -2.90 (2.04) | | -3.81 (3.13) |
| $drm*open_t$ | | 0.34 (0.24) | | 0.39* (0.20) | | 1.64 (1.30) | | 2.27 (2.01) |
| dfe_g_t | | 1.26** (0.48) | | 1.15** (0.46) | | -3.32 (4.99) | | -6.68 (8.26) |
| dfe_g*open_t | | -0.23 (0.35) | | -0.37 (0.31) | | 3.87 (4.04) | | 6.77 (6.75) |
| y_{t-1} | | | 0.24*** (0.06) | 0.23*** (0.06) | | | | |
| y_t^{US} | 1.39*** (0.14) | 1.37*** (0.14) | 1.31*** (0.15) | 1.30*** (0.15) | 1.59*** (0.13) | 1.47*** (0.21) | 1.55*** (0.14) | 1.31*** (0.33) |
| Δi_{t-1} | -0.15 (0.11) | -0.19* (0.11) | -0.37*** (0.10) | -0.39*** (0.10) | | | -0.13 (0.12) | -0.42* (0.24) |
| const | -0.61** (0.24) | -0.60** (0.24) | -1.03*** (0.18) | -1.01*** (0.19) | -1.18* (0.64) | -1.02 (0.65) | -1.15* (0.66) | -0.90 (0.79) |
| R^2 | 0.56 | 0.57 | 0.65 | 0.65 | 0.61 | 0.37 | 0.61 | |
| No. Obs. | 238 | 238 | 238 | 238 | 240 | 240 | 238 | 238 |
| Instruments: | drm _t , g _t , y _{t-1} | | | | | | | |

Note: The numbers in brackets are standard errors.

Variables: *dfe*: discretionary fiscal effort; *drm*: discretionary revenue measures; *dfe_g*: discretionary effort on the expenditure side; *y*: real GDP growth; y^{US} : US real GDP growth; Δi : the change in the short-term interest rate.