Part II

Performance of spending rules at EU and national level – a quantitative assessment

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KEY FINDINGS

This Part provides a novel quantitative assessment of spending rules in the EU and the Member States.

At EU level, simulations show that public debt ratios would have been significantly lower today if Member States had applied the expenditure benchmark consistently since 1999.

- The findings from counterfactual simulations show that a more front-loaded fiscal adjustment would have reduced public debt significantly, despite the negative effects of temporary lower economic growth and inflation.
- Debt reduction would have been particularly marked in high-debt Member States.
- The fiscal adjustment would have been slightly more growth-friendly based on the expenditure benchmark than on the structural balance requirement.

New evidence shows that the expenditure benchmark is more effective in reducing procyclicality than the change in the structural balance.

- Evidence from panel regressions shows that discretionary fiscal policies have, on average, been procyclical in the EU since 2000, with the main reason for this being fiscal loosening in good times.
- The expenditure benchmark appears to be a more effective indicator in reducing procyclicality than the structural balance.
- Strict compliance with the fiscal rules of the preventive arm would have resulted in an acyclical fiscal effort in the EU, while large deviations from the rules aggravate pro-cyclicality.

In terms of predictability, unbiased and realistic macroeconomic and budgetary projections are essential to effective fiscal surveillance.

- Indicators used to assess the fiscal effort in the preventive arm of the Pact do not appear to be systematically biased at EU, euro area or Member State level.
- While forecast errors can be sizeable, they are broadly similar regardless of whether the fiscal effort is based on the expenditure benchmark or the structural balance methodology.

New evidence shows that expenditure rules mitigate the procyclical bias of fiscal policies in the Member States.

- Empirical estimates over the last 20 years demonstrate that procyclicality is lower where there are expenditure rules in place.
- Designing expenditure rules better (in terms of their legal basis, independent monitoring, coverage and the consequences of non-compliance) also reduces procyclicality.
- A combination of expenditure rules and balanced budget rules attenuates the procyclical pattern of fiscal policy more than no rule.

1. INTRODUCTION

The EU fiscal governance system promotes a rules-based approach to fiscal policy whose primary objective is to tame the deficit bias and ensure sustainable public finances. A rules-based fiscal policy has been shown to be superior to a discretionary approach, since the latter is frequently time inconsistent and therefore leads to a deficit bias ([72]). The European Economic and Monetary Union (EMU) may actually exacerbate this deficit bias, in particular as negative externalities (e.g. a banking or debt crisis) can more easily spill over to other Member States, leading to 'contagion' effects ([73]). The Maastricht Treaty signed in 1992, obliges Member States to pursue sound fiscal policies and to abide by two main reference values: 3% of GDP for government deficit and 60% of GDP for government debt ([74]). The Stability and Growth Pact (SGP) agreed in 1997 was designed primarily as a means to keep public debt at sustainable levels, by both preventing excessive deficits ('preventive arm') and, where necessary, correcting them diligently ('corrective arm') ([75]). Without prejudice to the objective of sustainability, the SGP is also intended to allow for macroeconomic stabilisation.

The fiscal framework has evolved considerably in recent years: a key innovation was a greater focus on spending rules at EU and Member State level. Following the Great Recession, the fiscal governance framework was reinforced in 2011 (the 'six-pack' reform) and 2013 (the 'two-pack' reform) for three main reasons ([76]): (i) to foster fiscal sustainability ([77]), (ii) to allow for better macroeconomic stabilisation ([78]) and (iii) to improve the quality and effectiveness of national fiscal frameworks ([79]). A central element of the 2011 reform was the introduction of an expenditure benchmark at EU level, which complements the structural balance as a second indicator in the fiscal surveillance process of the preventive arm of the SGP. In parallel, many Member States introduced national spending rules –often in addition to balanced budget or debt rules– in the wake of the new directive of the 'six-pack' on the national fiscal framework.

The greater relevance of spending rules reflects the growing consensus in academia and policy circles that such rules constitute a more effective approach. The key rationale for introducing the expenditure benchmark at EU level was that it provides more operational guidance to Member States in the conduct of prudent fiscal policies, by focussing surveillance on indicators that are under direct government control. Many experts in international institutions, academia and think tanks have concluded that spending rules are generally more effective in reducing procyclical fiscal policy and promoting a better balance between budgetary discipline and macroeconomic stabilisation. They also tend to be more transparent and easier to monitor.

([72]) See Kydland and Prescott (1977) on the time inconsistency argument and Alesina and Perotti (1995) or Issing (2000) on the deficit bias.

([73]) Allen and Gale (2000).

([74]) The reference values were defined in the Protocol on the EDP annexed to the Maastricht Treaty.

([75]) While Member States agreed in 1997 on the Pact, the preventive/corrective arm of the Pact entered into force in 1998/1999.

([76]) Deroose and Mohl (2016), Buti (2019), European Commission (2019a).

([77]) Not enough advantage was taken of the favourable macroeconomic conditions in the years before the Great Recession to build up fiscal buffers (Schuknecht et al. 2011). High debt delayed the recovery from the recession (Jordà et al., 2016) and both rule design problems and governance failures contributed to poor enforcement of the SGP (Eyraud and Wu 2015). In a response, more emphasis was placed on the need for debt reduction in the corrective arm and a system to correct significant deviations from fiscal requirements was established in the preventive arm.

([78]) It was recognised that automatic stabilisers did not play out fully in practice throughout the cycle. There was greater acceptance of discretionary support under well-defined circumstances, such as at a time of deep economic shocks and/or if monetary policy is constrained, as spillovers can be larger and multipliers higher (Blanchard et al. 2013, Blanchard and Leigh 2013 or Christiano et al. 2011). In a response, a collective escape clause was inserted in the EU fiscal governance framework, allowing (but not prescribing) a suspension of the rules in the event of a 'severe economic downturn' in the EU or the euro area as a whole. In 2015, the framework was improved without changing the rules by better modulating the required fiscal effort across the economic cycle.

([79]) The gap between national budget discussions and European surveillance was a fundamental weakness of the framework in the pre-Great Recession decade.

However, quantitative analyses on the performance of the expenditure benchmark at EU level and spending rules at national level have been rare, a gap filled by this part of the report. This part examines how spending rules perform at both EU and national level on the basis of a quantitative assessment. Chapter II.2 reviews the academic literature surrounding expenditure rules. Chapter II.3 assesses how such rules perform at EU level. Chapter II.4 focuses on their performance at the national level. The analyses are factual and based on quantitative evidence and simulations. Finally, Chapter II.5 concludes this part of the report.

2. LITERATURE REVIEW

Well-designed expenditure rules can be an effective tool for reducing the deficit bias. By targeting the budget item that is most directly under the policymaker's control (i.e. expenditure as opposed to the budget balance or debt), expenditure rules can ensure compliance and hence reduce the deficit bias. Moreover, as expenditure overruns have been found to be a major factor in large deficits and increasing debt ratios in the EU, expenditure rules play an important role through addressing the main source of the deficit bias (Ayuso-i-Casals 2012).

Expenditure rules tend to lower procyclicality more than other type of rules. While a large proportion of revenue is sensitive to economic fluctuations and would thus react in a procyclical way during shocks, many components of expenditure are not. This means that an expenditure rule is better suited than other rules to protect expenditure from the economic cycle. In this way, it confers either acyclical or countercyclical behaviour on the fiscal balance. Turrini (2008) finds evidence of procyclical expenditure in the euro area over 1980-2005. Similarly, Wierts (2008) presents evidence (involving 15 countries over a time period from 1998-2005) that national expenditure rules can limit procyclical expenditure, especially at times of revenue shortfalls. Finally, Holm-Hadulla et al. (2012) find that expenditure rules reduced EU countries' procyclical spending bias in 1998-2005.

Expenditure rules are associated with lower expenditure volatility, higher investment efficiency and more transparency. Evidence for a sample of almost 30 advanced and developing countries in 1985-2013 shows that when these rules are present a country has higher spending control, countercyclical fiscal policy and improved fiscal discipline (Cordes et al. 2015). The study also finds that expenditure rules are associated with lower expenditure volatility and higher public investment efficiency. In addition, most expenditure aggregates tend to be more easily understood than alternative indicators, such as the structural balance, although arguably the targeted rate of growth can still be based on unobserved variables (e.g. for the EU expenditure benchmark). This is because they rely less on estimated and unobservable variables, making expenditure rules more transparent and easier to monitor in real time.

Only a few studies examine the interaction between national and international rules, and their conclusions differ. Looking at 74 developing countries over 1990-2007, Tapsoba (2012) finds that the effect of fiscal rules is reduced by the presence of supranational rules, an impact explained by the generally weak enforcement of supranational rules in these countries. In contrast, Heinemann et al. (2018) find in their metadata analysis of fiscal rules that when the model controls for supranational rules, then the impact of national rules has higher levels of statistical significance.

There seems to be a tendency to comply more with expenditure rules than with other fiscal rules, especially when the targeted aggregate is directly under government control. Given the challenges posed by assessing compliance with fiscal rules, only a few studies provide evidence of compliance. The study by Cordes et al. (2015) finds that countries comply more often with expenditure rules than with other fiscal rules. Moreover, compliance is higher if the expenditure target is directly under governmental control and if the rule is enshrined in law or in a coalition agreement. Reuter (2015) examines compliance with 23 national numerical fiscal rules in force between 1994 and 2012. The study finds compliance for about 50% of the observations. It also shows that national numerical fiscal rules have a strong and positive impact on budgetary discipline, even if compliance is less than total.

Drawbacks of expenditure rules include a change in expenditure composition and reduced incentives for efficient revenue policies. Expenditure rules also have some less desirable properties, so it is important to design them carefully (Box II.2.1). Specifying a target in terms of expenditure as a percentage of GDP would confer a procyclical behaviour on expenditure. This means it is preferable to specify the target in a different way. In raising the fiscal effort on the expenditure side, expenditure rules could change the composition of spending, by giving preferential treatment to items that are politically harder to cut (wages and public consumption) at the expense of capital investment, which is much more likely to produce growth. This is confirmed by empirical studies by Dahan and Strawczynski (2013), and Bedogni and Meaney (2017). Moreover,

introducing expenditure rules could result in less attention being paid to revenue mobilisation and reforms (OECD 2010). Taking those shortcomings into account, the literature often advises supplementing expenditure rules with a budget balance rule or revenue rule (Ayuso-i-Casals 2012, IMF 2018).

Box II.2.1: Key features for an effective design of expenditure rules

How you specify the target affects the properties of the expenditure rule ([1]). As thoroughly documented by Ayuso-i-Casals (2012), each way of specifying the target has its own advantages and disadvantages.

- ***The expenditure rule target can be expressed as a ratio of expenditure to GDP, in numerical terms or as a growth rate***. If the aim is to avoid a procyclical bias, it is unadvisable to specify a target as a percentage of GDP, as that encourages higher expenditure at times of economic expansion and lower expenditure when the economy is contracting. Conversely, a ceiling with a numerical target (expressed in nominal or real terms) or a reference to a growth rate (e.g. GDP, nominal output) would be less procyclical and be perceived, at least in the case of a numerical target, as a more observable and hence binding objective.

- ***Spending can refer to nominal or real expenditure***. On the one hand, spending targets specified in nominal terms can be more transparent and hence easier to monitor. They can also require a higher-than-expected adjustment in the event of positive inflation surprises. On the other hand, if the target is specified in real terms, compliance is not affected by inflation and the target can be valid if the government intends to keep the volume of goods and services stable. However, a real target could be prone to revisions of the deflator, making the target less visible and firm. It is also challenging to design the appropriate benchmark (i.e. counterfactual scenario) with which spending developments should be compared ([2]).

- ***The target can refer to different coverages of expenditure***. Interest payments are often excluded, as they are not under direct government control in the short term. In some instances, public investment is also excluded, to avoid a composition bias against the important growth-oriented item of public investment. Cyclically-sensitive items are also usually excluded, as they are not under government control in the short run. This applies to unemployment benefits, for example.

- ***Finally, the same elements of national fiscal frameworks that help to strengthen national fiscal rules also contribute in general to stepping up expenditure rules***. These include i) a statutory basis that makes them hard to modify (Inman 1996); ii) enforcement and monitoring by an independent body; iii) mechanisms to correct for past deviations from the target or the adjustment path to it; iv) and consistency with medium-term budgetary plans. In addition, and as put forward by Kopits and Symansky (1998) fiscal rules would benefit from a wide range of properties, including simplicity, transparency, flexibility (i.e., the possibility for the rules to adapt to changing conditions), consistency with their final goal, and compatibility with structural reforms. Finally, fiscal rules and fiscal frameworks more generally need strong political commitment and social consensus, and should be both transparent and comprehensive.

([1]) This part draws largely on Ayuso-i-Casals (2012).
([2]) Instead of using the 10-year potential growth rate, the spending developments could be compared to a price index (e.g. HICP), so that neutral spending policy is defined as spending that is constant in real terms (ECB, 2014).

3. PERFORMANCE OF SPENDING RULES AT EU LEVEL

3.1. BACKGROUND AND CONCEPTUAL FRAMEWORK

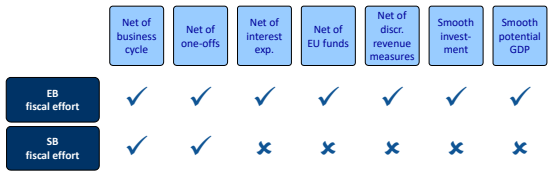
One main lesson of the pre-Great Recession period was that the change in the structural balance is an imperfect indicator of the actual fiscal effort. Since the SGP reform in 2005, a key indicator of the discretionary fiscal effort of the preventive arm of the SGP has been the change in the structural balance. The change in the structural balance corresponds to a top-down indicator of the fiscal effort ([80]). It corrects the budget balance for the economic cycle and certain one-off measures, since they have only a temporary effect and thus cannot lead to a sustained impact on the government's fiscal position (Box II.3.1). While the change in the structural balance is well-established and widely-known, it can be distorted by non-policy effects. If that happens, it will measure the fiscal effort imperfectly. This, for instance, was what happened in Spain in the pre-Great Recession period, where unsustainable revenue windfalls stemming from asset bubbles gave a too rosy picture of the underlying budgetary position (Graph II.3.1).

Graph II.3.1: **Fiscal effort in Spain (1999-2019, % of GDP)**

Note: Positive (negative) values correspond to a fiscal tightening (loosening).
Source: Commission spring 2019 forecast.

As a consequence, the 2011 reform of the SGP introduced the expenditure benchmark as a second indicator of the actual fiscal effort in the preventive arm of the SGP. The basic idea of the expenditure benchmark is to identify the actual fiscal effort by comparing expenditure growth (net of discretionary revenue measures and other factors) against the benchmark of 10-year average potential growth. The expenditure benchmark can be considered a quasi-bottom-up measure: It is based on a bottom-up narrative approach to identify discretionary revenue measures ([81]) and relies on a top-down approach on the expenditure side ([82]). The expenditure benchmark nets out factors that are beyond government control in the short run, namely the economic cycle, one-off measures, interest payments and government expenditure on EU programmes that is fully matched by revenue from EU funds. Discretionary revenue measures are removed to measure the fiscal effort irrespective of the size of the government. In addition, public investment in excess of smoothed public investment is subtracted from total expenditure to protect the sustainable part of public investment. Finally, the expenditure benchmark smooths potential GDP over 10 years to mitigate the impact of revisions (Graph II.3.2, Box II.3.1) ([83]). Despite the positive features, the expenditure benchmark faces challenges, in particular in terms of data availability and measurement of discretionary revenue measures (accuracy may depend on government information, while indirect effects are difficult to capture).

Graph II.3.2: **Measurement of the fiscal effort through the expenditure benchmark and the structural balance – a comparison**



Quantitative analyses on the performance of the EU expenditure benchmark do not exist to the best of our knowledge. There is a literature on the theoretical and empirical performance of fiscal rules in general ([84]) and spending rules in particular (Chapter II.2). However, a thorough quantitative assessment of the key indicators of the preventive arm of the SGP, namely the EU expenditure benchmark also with respect to the structural balance, does not exist as far as we are aware.

([80]) Alesina and Perotti (1995).

([81]) Romer and Romer (2010).
([82]) Carnot and de Castro (2015).
([83]) European Commission (2019a).
([84]) For a survey, see Heinemann et al. (2018).

The chapters that follow assesses the performance of the EU expenditure benchmark also vis-à-vis the structural balance across three dimensions, which are considered particularly relevant to a well-functioning fiscal framework.

- ***Sustainability****:* Would the indicators have ensured the long-term sustainability of public finances if the Member States had applied and complied with them since 1999 (Chapter II.3.2)?

  The SGP was designed primarily to tame the deficit bias and prevent and, whenever necessary, correct excessive deficits and debt and to keep public finances sustainable. High public debt can hamper economic growth ([85]), delay the recovery process ([86]), jeopardise financial stability ([87]) and distort the effective functioning of monetary policy ([88]).

- ***Stabilisation****:* Do the indicators provide an appropriate degree of stabilisation (Chapter II.3.3)?

  While the main goal of the SGP is to prevent excessive deficits and debt, it should, in principle, allow Member States to deal with normal cyclical fluctuations by letting automatic stabilisers operate freely ([89]) (Chapter II.3.2). In the case of very large shocks ([90]) or constrained monetary policy ([91]), automatic stabilisers alone may not be sufficient to smooth income and demand and may need to be supplemented by discretionary fiscal policy. However, discretionary fiscal policy interventions can have drawbacks (e.g. imprecise design, implementation lags, not being offset in bad times, objectives unrelated to stabilisation) and they should be used only if needs are clear and they pose no risk to the sustainability of public finances.

- ***Predictability****:* Do the indicators display the properties of reliable indicators, i.e. are they unbiased and do they guarantee a high level of predictability (Chapter II.3.4)?

  The Commission forecast has implications for fiscal surveillance in that it triggers procedural steps under the preventive and/or corrective arm of the SGP. Unbiased, high-quality projections are thus essential for fiscal surveillance to work effectively ([92]). The latest reforms of the SGP put greater emphasis on the quality of forecasts. For instance, the Directive on budgetary frameworks as part of the six-pack reform of 2011 requires Member States to engage regularly in a technical dialogue with the Commission. The two-pack reform requires euro area Member States to prepare or at least endorse macroeconomic projections for draft budgets by independent bodies.

([85]) While there is clear evidence that countries with high public debt grow more slowly (Reinhart and Rogoff 2010, Woo and Kumar 2015, Chudik et al. 2017), there is a disagreement about the precise threshold level of debt-to-GDP beyond which growth slows down significantly.
([86]) Jordà et al. (2016).
([87]) Beck (2012).
([88]) Issing (2017).
([89]) For an assessment of automatic stabilisers in the EU, see Chapter I.2 of this report or Mohl et al. (2019), European Commission (2017), in 't Veld et al. (2013), Dolls et al. (2012).
([90]) Christiano et al. (2011).
([91]) Blanchard et al. (2013), Blanchard and Leigh (2013).
([92]) Leal et al. (2007).

Box II.3.1: Assessing the actual fiscal effort under the preventive arm of the SGP

This box describes the two indicators used to measure the actual fiscal effort in the preventive arm of the Stability and Growth Pact (SGP). The concept of the fiscal effort plays a crucial role in assessing compliance with the SGP. While not observable, the fiscal effort is intended to measure the sustainable, i.e. non-temporary, effect of government policy on the budget balance and thereby to serve as an indicator for which the government can be held accountable ([1]).

Since the reform of the SGP in 2005, the actual fiscal effort in the preventive arm has been assessed by the change in the structural balance ([2]):

$$actual\ effort_t^{SB} = \Delta sb_t = \Delta(hb_t - \epsilon_t\ og_t - oo_t)$$

The change in the structural balance (Δsb) corresponds to a top-down indicator of the fiscal effort. It corrects the general government headline balance (*hb*) for the economic cycle and certain one-off measures (*oo*) ([3]). The impact of the economic cycle is measured by applying a commonly agreed method of cyclical adjustment which was developed by the Commission ([4]). In this method, the cyclical component of the budget balance is the product of the output gap (*OG*), i.e. the difference between real and potential GDP, and the estimated sensitivity of the government balance with respect to output (ϵ) ([5]). A positive (negative) value corresponds to a fiscal tightening (loosening).

Since the 2011 reform of the SGP (the six-pack reform), the actual fiscal effort has also been assessed by applying the expenditure benchmark methodology. The basic idea is to compare the growth of general government expenditure net of several factors with an appropriate benchmark. The expenditure benchmark can be considered a quasi-bottom-up measure: It is based on a bottom-up narrative approach to identify discretionary revenue measures ([6]) and relies on a top-down approach on the expenditure side ([7]). This indicator can be constructed in three steps.

First, the net expenditure growth rate is determined. For this purpose, a modified expenditure aggregate (MAE) is calculated:

$$MEA_t = TE_t - IE_t - EU_t - UB_t - OO_t - INV_t + \frac{1}{4} \cdot \sum_{t=-3}^{1} INV_t$$

The modified expenditure aggregate nets out several factors from total expenditure (*TE*) for which the government is not considered accountable in the short term, namely interest expenditure (*IE*), expenditure on EU programmes fully matched by revenue from EU funds (*EU*) and cyclical unemployment benefit expenditure (*UB*). One-off measures (*OO*) are not taken into account either, since they have only a temporary effect. Finally, public investment in excess of smoothed public investment (*INV*) is subtracted from total expenditure to protect the non-excessive part of public investment. The net expenditure growth rate (*g*) is then obtained by subtracting discretionary revenue measures (*DRM*) from the modified expenditure aggregate that have an incremental effect on revenues collected in *t* with respect to *t-1*:

$$g_t = \frac{MEA_t - DRM_t - MEA_{t-1}}{MEA_{t-1}}$$

([1]) European Commission (2013).
([2]) In terms of notation, we denote variables in percent of (actual or potential) GDP in lower cases and variables in levels (e.g. in millions of euro) in capital letters.
([3]) These measures capture certain one-off revenues (e.g. sales of telecommunication licences) and one-off capital transfers (e.g. financial assistance to the banking sector).
([4]) Havik et al. (2014), Larch and Turrini (2009).
([5]) The semi-elasticity of the headline balance measures the percentage by which the general government budget reacts following a change in the economic cycle (Mourre et al. 2019).
([6]) Romer and Romer (2010).
([7]) Carnot and de Castro (2015).

(Continued on the next page)

Box (continued)

Second, the benchmark against which the net expenditure growth rate is compared is calculated. Net expenditure growth is compared with potential GDP growth. Since annual potential GDP growth rates have been frequently revised during the surveillance cycle, net expenditure growth is compared against the more stable 10-year geometric average potential GDP growth rate (y), taking into account growth rates from t-5 to t+4, i.e.:

$$\bar{y}_t^{SF,t-1} = \left(\sqrt[10]{\prod_{t=-5}^{4} (1 + y_t)} - 1 \right)$$

where potential growth is measured at the time of the Commission spring forecast of the preceding year and then 'frozen' throughout the surveillance cycle. While potential GDP is measured in real terms, expenditure plans are typically set in nominal terms. The benchmark ($\bar{y}_t{}^*$) therefore corresponds to the 10-year potential growth rate inflated using the GDP inflation rate (p_t):

$$\bar{y}_t{}^* = \left(1 + \bar{y}_t^{SF,t-1}\right) \cdot \left(1 + p_t^{SF,t-1}\right) - 1$$

Finally, the actual fiscal effort based on the expenditure benchmark methodology is determined as follows:

$$actual\ effort_t^{EB} = (\bar{y}_t{}^* - g_t) \cdot \frac{MEA_{t-1}}{GDP_t}$$

To make it comparable to the structural balance-based effort, it is expressed (i) as a percentage of GDP and (ii) as a difference between benchmark and net expenditure growth rate. This implies that positive (negative) values correspond to a fiscal tightening (loosening) ([8]).

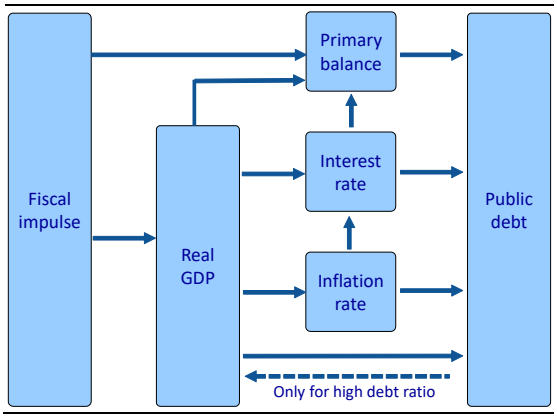
([8]) Note that some expenditure components are only partly available in previous Commission forecast vintages. This includes government expenditure on EU programmes, which is fully matched by EU funds revenues (only available since Commission spring 2017 forecast), cyclical unemployment benefits, discretionary revenue measures (since Commission autumn 2009 forecast).

3.2. ASSESSING OF SUSTAINABILITY

3.2.1. Approach to assessing sustainability

A simple dynamic model is used to assess whether the rules of the preventive arm of the SGP would have ensured sustainable public finances if Member States had applied and complied with them since 1999 (see Box II.3.2 for a detailed description of the model). Summarised in one sentence, the framework models the effects of a fiscal adjustment path in compliance with the preventive arm on output, prices, interest rates, fiscal balances and debt starting from the data baseline over the 1999-2019 period ([93]). In greater detail, the model first determines the fiscal adjustment compared to the baseline scenario required to comply with the preventive arm (in the following fiscal impulse). The fiscal impulse has a direct impact on the level of real GDP (via a fiscal multiplier) ([94]) and the primary balance as well as an indirect impact on prices (Phillips curve) and interest rates (Taylor rule). This makes it possible to determine a counterfactual public-debt-to-GDP path (Graph III.3.3). While the model borrows some elements of standard macroeconomic models (such as Phillips curve and Taylor rule), it abstracts from most behavioural equations.

Graph II.3.3: **Main transmission channels of the fiscal impulse on public debt under the counterfactual scenario**



The model compares the fiscal path of the baseline scenario with three counterfactual scenarios.

- ***Strict compliance*** (S.1): Under the strict compliance scenario, the fiscal impulse is defined as the difference between the *required* fiscal adjustment to comply strictly with the preventive arm and the *actual* fiscal effort under the baseline scenario. The required fiscal effort is equivalent to the fiscal adjustment requested by the matrix of requirements ([95]) or, if smaller, the distance of the structural balance to the medium-term budgetary objective (MTO) ([96]). The actual fiscal effort corresponds to one of the two key indicators of the preventive arm of the SGP, namely the effort derived from the expenditure benchmark methodology and the change in the structural balance (Box II.3.1). Data for the baseline scenario are taken from the Commission spring 2019 forecast. Note that the adjustment path between the two fiscal efforts differs only for Member States on their adjustment path towards the MTO. The model assumes that Member States reaching their MTO will then stay at their MTO.
- ***Compliance with a capped fiscal effort*** (S.2): The fiscal impulse is defined as in S.1 but capped at an interval between +1 and -1 to prevent a too demanding speed of fiscal adjustment. Compared with the strict compliance scenario, broad compliance implies a somewhat more back-loaded fiscal adjustment path for some Member States.
- ***Compliance with a capped fiscal effort and an escape clause*** (S.3): The fiscal impulse is defined as in S.2, but an escape clause is introduced. That escape clause is triggered in severe downturns, which are defined in line with the SGP's rationale as 'exceptionally bad times', i.e. a (counterfactual) output gap below -4% of potential GDP and/or a negative real GDP growth rate. In severe downturns, the fiscal impulse corresponds to the minimum

([93]) Our work draws on similar counterfactual exercises, which are currently in the making, see Arnold and Garcia-Macia (2020), Hauptmeier and Kamps (2020).
([94]) The design of the fiscal multiplier follows Ramey (2019); see for an empirical overview of fiscal multipliers Gechert and Rannenberg (2018).
([95]) In the EU fiscal governance framework, the required annual fiscal adjustment is modulated over the economic cycle in line with the so-called 'matrix of requirement' (European Commission 2019a).
([96]) The MTO is defined in structural terms. We use the country-specific MTOs as defined since 2006. For the time before 2006, we set the MTO for each Member State to a (structural) deficit of 0.5% of GDP.

between the fiscal effort under the baseline scenario and zero. Compared to the previous scenarios, this results in a looser fiscal policy response during severe downturns.

3.2.2. Main findings

The main findings of the analysis are presented in three blocks. First, developments in spending dynamics under the baseline scenario are introduced, i.e. based on the Commission spring 2019 forecast. Second, the counterfactual scenarios for both types of fiscal efforts (based on expenditure benchmark and structural balance methodology) are shown. Finally, sensitivity analyses are presented.

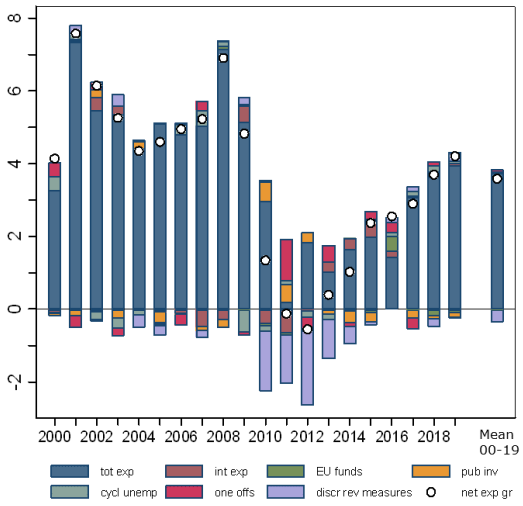
Baseline scenario: spending dynamics and size of fiscal effort

Net expenditure grew by an average of about 3.5 percent annually in the EU between 2000 and 2019 (Graph II.3.4) ([97]). Among the expenditure benchmark components, the largest positive contributions to expenditure growth came from total general government expenditure (3.7 pps.), followed by one-off and temporary measures (0.1 pps.). Discretionary revenue measures contributed negatively to net expenditure growth (-0.3 pps.), mainly because of tax hikes in the years following the outbreak of the Great Recession (between 2009 and 2014). The remaining factors have a non-negligible impact on the net expenditure growth rate in certain years, but their contributions cancel out over the 2000-2019 period as a whole ([98]).

The actual fiscal effort over the past twenty years corresponds to a moderate annual fiscal tightening of around 0.2 pps. of GDP in the EU on average (Table II.3.1, Graph II.3.4). The tightening is slightly stronger when measured in 'real time', i.e. based on the Commission spring forecast vintages for the preceding year, than when measured '*ex post*', i.e. based on the Commission spring 2019 forecast ([99]). The difference between both datasets is however small (0.1 pps.).

The tightening of the actual fiscal effort was slightly stronger when measured with the expenditure benchmark than with the structural balance methodology. However, the difference between the two indicators is small (0.1 pps.).

Graph II.3.4: **Key contributions to net expenditure growth (EU, 2000-2019, y-o-y growth rate)**



Source: Commission spring 2019 forecast.

Table II.3.1: **Descriptive statistics of the fiscal effort (EU, 1999-2019, % of GDP)**

	EB fiscal effort		SB fiscal effort		Difference
	Mean	*(Obs)*	Mean	*(Obs)*	
Full sample					
Real time	0.3	*(434)*	0.2	*(470)*	0.1
Ex post	0.2	*(491)*	0.1	*(493)*	0.1
Good times (OG > 0)					
Real time	-0.6	*(146)*	0.0	*(174)*	-0.6
Ex post	-0.5	*(256)*	-0.1	*(258)*	-0.4
Bad times (OG < 0)					
Real time	0.8	*(288)*	0.3	*(296)*	0.5
Ex post	1.0	*(235)*	0.3	*(235)*	0.7

Note: Real time refers to the Commission spring forecast vintages over the 2000 to 2019 period; ex-post stems from the Commission spring 2019 forecast. The table shows simple unweighted averages of the fiscal effort for the EU (changing composition).

([97]) Contributions are calculated as $\%\,\Delta_{i,t} = 100 \cdot \frac{q_{i,t-1}}{\sum_i q_{i,t-1}} \cdot \left(\frac{q_{i,t}}{q_{i,t-1}} - 1\right)$, with $q_{i,t}$ is the volume of the i^{th} component of year *t*. EU aggregates are calculated using nominal GDP weights.

([98]) Small positive, i.e. expenditure decreasing, contributions came from interest expenditure (0.02 pps.) and cyclical unemployment (0.01 pps.), while small negative, i.e. expenditure increasing, contributions arose from investment smoothing (-0.02 pps.) and EU funds (-0.01 pps.).

([99]) Real-time observations stem from the Commission spring forecast vintages for the preceding year, while *ex-post* data come from the Commission spring 2019 forecast.

The actual fiscal effort measured with the expenditure benchmark methodology turned out to be more expansionary in good times and more contractionary in bad times than the change in the structural balance. This in turn means that it is more demanding to achieve the required fiscal requirements based on the expenditure benchmark than the structural balance in good times, while it is less demanding to achieve those requirements based on the expenditure benchmark than the structural balance in bad times. The finding holds irrespective of the type of database used (real time vs. *ex post*).

Counterfactual scenario: expenditure benchmark

Strict compliance with the expenditure benchmark would have required a more front-loaded and tighter fiscal adjustment compared with the baseline scenario (green line in upper left panel of Graph II.3.5). To start with, we focus on the six largest euro area Member States corresponding to around 85% of total euro area public debt and nominal GDP in 2020. In the strict compliance scenario, the relatively good economic times prior to the outbreak of the Great Recession would have been used to build up fiscal buffers and converge towards the MTO. By 2010, the fiscal adjustment would have been 3.5 pps. of GDP tighter than under the baseline scenario (see cumulated fiscal impulse of Graph II.3.5). After having reached their MTO, Member States would have stayed there. As a result, the fiscal adjustment would have been significantly looser than under the baseline scenario since 2010. Over the entire 20-year period, fiscal tightening under the counterfactual scenario would have been only 0.5 pps. of GDP higher than under the baseline scenario.

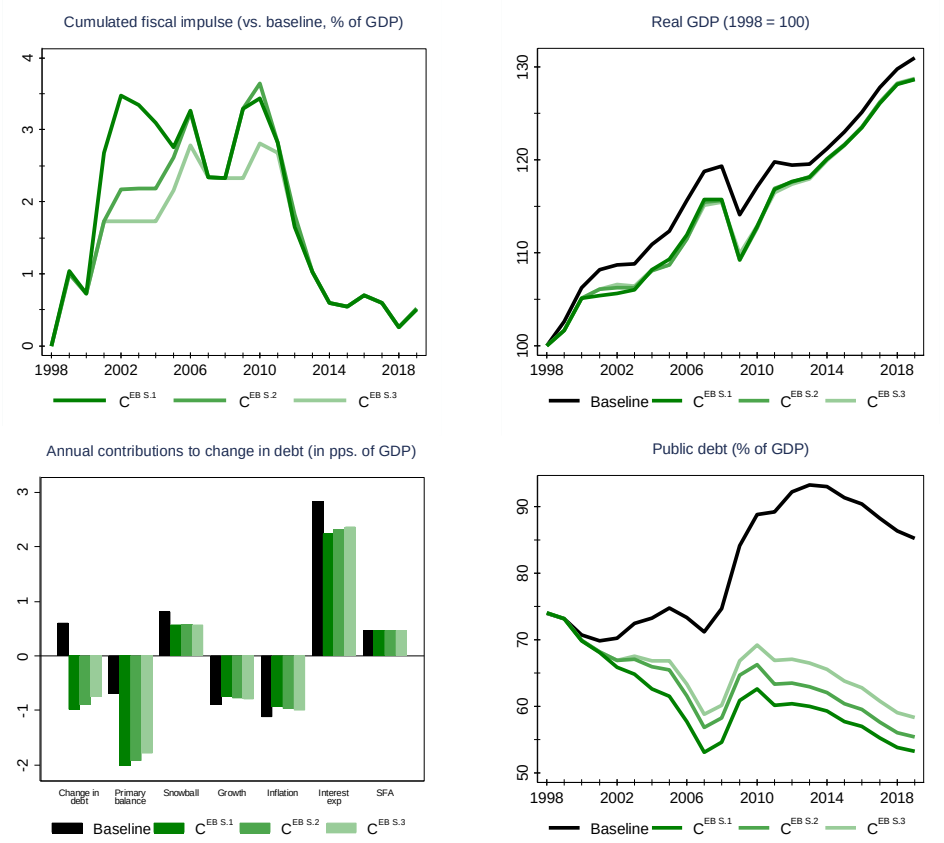
Under the strict compliance scenario, public debt ratios would have declined despite lower growth and inflation thanks to higher primary surpluses and lower interest payments (green bars in the lower left panel of Graph II.3.5). The more front-loaded and tighter fiscal adjustment in the pre-Great Recession decade would have led to higher primary surpluses and lower interest payments, which would have reduced public debt ratios significantly. The stock flow adjustment is assumed to remain unchanged compared with the baseline scenario.

The size of the adverse GDP effects depends on the assumptions for the fiscal multiplier. In our baseline scenarios, there is no free lunch with such a fiscal adjustment: debt reduction would have been slowed by lower growth and inflation in comparison with the baseline scenario. The level of real GDP would have been reduced by almost 2% of GDP by the end of 2019 compared with the baseline (green line in the upper right panel of Graph II.3.5). The baseline scenarios shown below are based on a sizeable, non-time varying fiscal multiplier of 0.7 on impact, cumulating to around 1.2 over three years ([100]). Assuming a more moderate adverse impact (following for instance Giavazzi et al. 2019) would mitigate or even offset the negative impact on GDP (see Box II.3.2. for further details). In addition, the build up of fiscal buffers under the counterfactual scenario would allow Member States to better react to future negative shocks by letting automatic stabiliser play freely and potentially supporting the economy with well-designed discretionary fiscal interventions in case of deep shocks. This would reduce the adverse GDP effects in the future.

As a result, public debt would have fallen below 60% of GDP in 2019 (green line in the lower right panel of Graph II.3.5). Following the build-up of fiscal buffers, the public-debt-to-GDP ratio would have declined to around 53% of GDP in 2007, i.e. by more than 20 pps. of GDP below the baseline. Public debt would have soared to around 63% of GDP after the outbreak of the Great Recession, before declining again to around 53% of GDP in 2019. Overall, the public-debt-to-GDP ratio would have been significantly lower than under the baseline scenario in both 1999 and 2019.

([100]) Ramey (2019).

Graph II.3.5: **Counterfactual scenarios: expenditure benchmark (EU6, 1999-2019)**

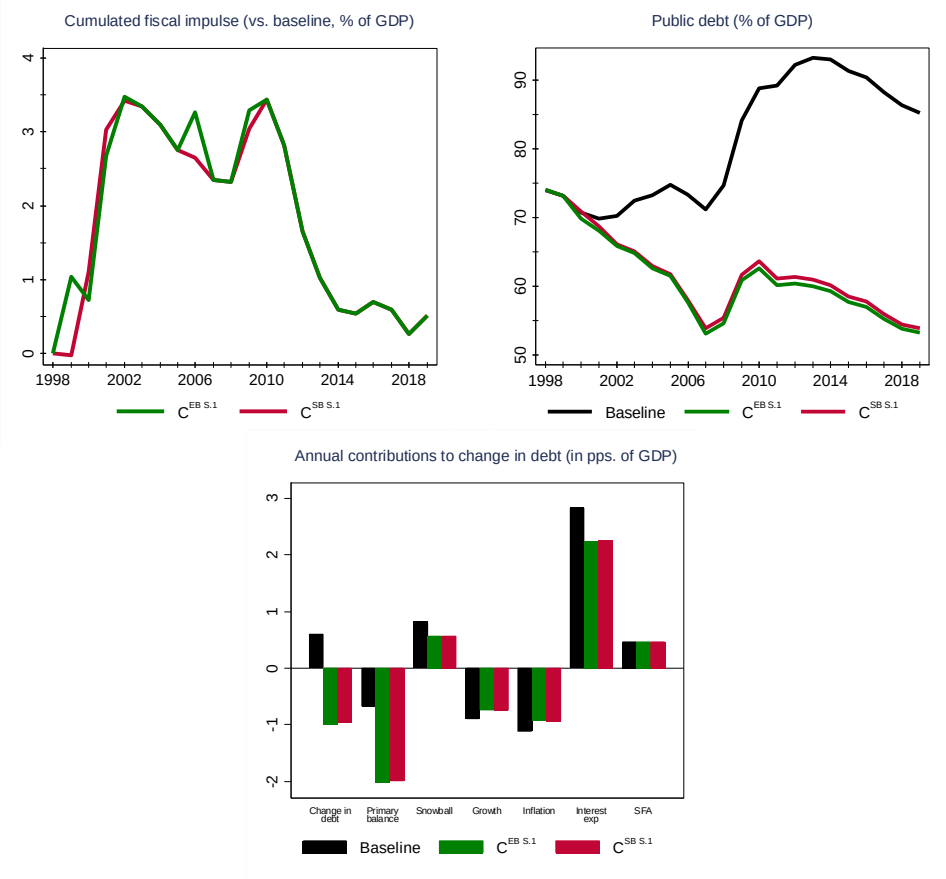


Note: A positive (negative) impulse points to a fiscal tightening (loosening) compared to the baseline scenario.

The public debt ratio would have been somewhat higher in the event of capping the fiscal effort (lighter green lines and bars of Graph II.3.5). Under the S.2 scenario, there would be a somewhat slower fiscal adjustment path, owing to the capping of the fiscal impulse at maximum 1% of GDP. Compared with the strict compliance scenario, the impact of primary surplus and interest payments on debt reduction would have been smaller, while the effect of real growth and inflation would have been stronger. As a result, the public debt ratio would have been somewhat higher than under strict compliance (55% of GDP in 2019).

The public debt ratio would have been somewhat higher in the event of an escape clause (light green lines and bars of Graph II.3.5). Compared with the previous scenarios, the escape clause would have allowed for a greater fiscal easing during severe downturns, resulting in a more growth-friendly and more back-loaded fiscal adjustment (S.3 scenario). In the specific example of the six largest euro area Member States shown here, the escape clause would have been triggered twice, namely at the beginning of the 2000s and after the outbreak of the Great Recession. Under the escape clause, public debt would end up about 5 pps. of GDP higher in 2019 than in the S.1 scenario. Still, the public debt ratio would have been lower than under the baseline scenario in 1999 and 2019.

Graph II.3.6: **Counterfactual scenarios: expenditure benchmark vs. structural balance (EU6, 1999-2019)**



Counterfactual scenarios: expenditure benchmark vs. structural balance

The counterfactual scenarios of the expenditure benchmark and structural balance are broadly similar (Graph II.3.6). The expenditure benchmark typically requires a slightly larger fiscal adjustment in good times and smaller in bad times than the change in the structural balance ([101]). In the specific case of the EU6 as an aggregate, this leads to a slightly more front-loaded fiscal adjustment path under the expenditure benchmark, resulting in a slightly smaller debt-to-GDP ratio at the end of 2019. Overall, the differences between the two adjustment paths are rather small for two reasons. First, the required fiscal impulses are assumed to differ only for Member States on their adjustment path towards the MTO, but identical for Member States at their MTO. Second, the baseline scenarios assume that the size of the fiscal multiplier is identical in good and bad times, leading to rather similar counterfactual GDP effects Assuming that fiscal adjustment has smaller adverse growth effects in good than in bad times, ([102]) implies that the expenditure benchmark ensures a slightly more growth-friendly adjustment path.

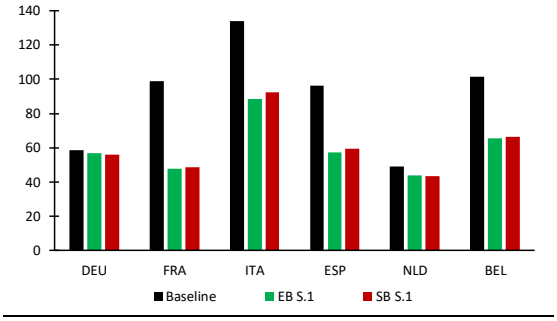
Overall, irrespective of the type of fiscal effort, public debt reduction would have been particularly strong for high-debt Member States (Graph II.3.7). The simulations show that the counterfactual public-debt-to-GDP ratios are rather close to the baseline scenario for Member States with lower public debt (DE and NL). In Member States with public debt close to or above 100% of GDP (BE, FR, ES, and IT), the

([101]) The reason for this is that the actual fiscal effort based on the expenditure methodology appears to be slightly smaller in good times and larger in bad times than the structural balance requirement (Table II.3.1).

([102]) Auerbach and Gorodnichenko (2012).

counterfactual public debt-to-GDP ratios are significantly below the baseline scenario.

Graph II.3.7: **Counterfactual debt ratios for the six largest euro area Member States (2019, % of GDP)**



Counterfactual scenarios: robustness analyses

Modifying the definition of the expenditure benchmark would have had only a minor impact on the counterfactual debt-to-GDP ratios (Graph II.3.8). We checked the impact of modifying the definition of the *actual* fiscal effort based on the expenditure benchmark methodology. Overall, the impact is rather small.

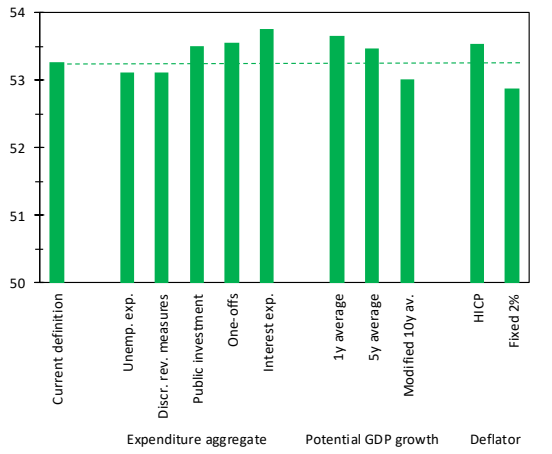
Expenditure aggregate: The debt-to-GDP ratios would be slightly larger if interest expenditure, one-off measures and public investment were *not* netted out from the expenditure aggregate and slightly smaller if unemployment expenditure and discretionary revenue measures were not removed.

Potential GDP: Public debt ratios would have been slightly higher if potential growth were measured with an annual or 5-year average growth rate, while it would have been slightly lower based on a modified 10-year average growth rate ([103]).

Deflator: Inflating potential by a fixed 2% would have led to a slightly smaller debt ratio. This is because the counterfactual fiscal adjustment would have been slightly more front-loaded (higher adjustment requirement in the pre-Great Recession years because of inflation exceeding 2%), which would have more than offset the smaller required fiscal adjustment in the post-Great Recession period.

([103]) The modified 10-year average gives less weight to forecast values, since it is based on the 10-year average ranging from t-8 to t+1 compared with the currently used definition (10-year average from t-5 to t+4).

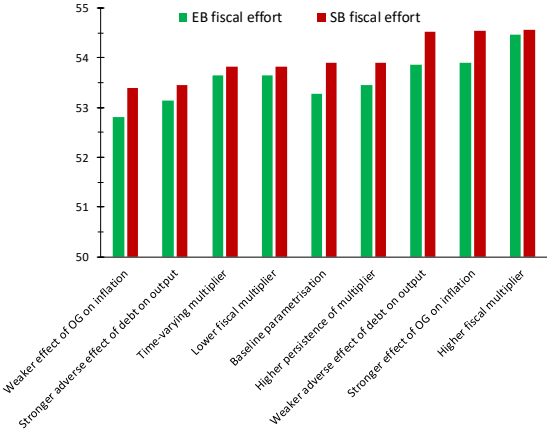
Graph II.3.8: **Counterfactual debt ratios – different definitions of the EB-based fiscal effort (EU6, 2019, % of GDP)**



Note: The following modifications are assessed: expenditure aggregate: assume that the 5 listed components are not netted out from the modified expenditure benchmark. Potential GDP: Instead of using the 10-year average potential GDP growth (based on the growth rates from t-5 to t+4), use: (i) 1-year potential GDP growth, (ii) 5-year potential GDP growth (t-3, …, t+1), (iii) modified 10-year potential GDP (t-8, …, t+1). Deflators: Instead of using the GDP inflation use (i) HICP inflation, (ii) a fixed 2% inflation rate in line with the ECB's medium-term price stability objective.

Finally, sensitivity tests on the model parameters broadly confirm the main findings (Graph II.3.9). We ran robustness tests assessing the effects of different parametrisation of the (i) fiscal multiplier, (ii) pass-through of output gap on inflation and (iii) strength of adverse effects of debt on output. Overall, the main findings hardly differ for the specific case of the EU6 aggregate.

Graph II.3.9: **Counterfactual debt ratios – sensitivity analysis (EU6, 2019, % of GDP)**



Box II.3.2: Assessing fiscal sustainability – a simple dynamic model for counterfactual simulations

This box describes the main features of the simple dynamic model used for the counterfactual fiscal simulations. In a nutshell, the model assesses the impact of an alternative fiscal adjustment path on output, prices, interest rates, fiscal balances and debt departing from the data baseline over the 1999-2019 period. A distinct feature of the framework is to model the counterfactual fiscal adjustment needed to comply with the preventive arm (in the following fiscal impulse). The modelling of the pass-through from the fiscal impulse on real GDP (fiscal multiplier), prices (Phillips curve) and interest rates (Taylor rule) is fairly standard.

Notation

In the following, we denote variables from the baseline model, i.e. the Commission spring 2019 forecast, with a superscript *b*, variables in levels (e.g. in millions of EUR) in capital letters and variables in ratios (to (potential) GDP or to previous value) in lower case letters.

Fiscal impulse

The model is initiated in each year from 1999 to 2019 by determining the fiscal adjustment required under the counterfactual scenario to comply with the preventive arm. We define the fiscal impulse (f) as the difference between the *required* fiscal effort to comply with the preventive arm and the *actual* fiscal effort under the baseline scenario:

$$f_t = required\ effort_t - actual\ effort_t^b \tag{1}$$

where the *required* fiscal effort under the counterfactual scenario is determined in line with the rationale of the SGP's preventive arm as the matrix requirement or, if smaller, the distance of the MTO to the lagged structural balance. The *actual* effort under the baseline scenario corresponds to the two key indicators measuring the actual fiscal effort under the preventive arm, namely (i) the effort derived from the expenditure benchmark methodology and (ii) the change in the structural balance (Box II.3.1). A positive (negative) impulse corresponds to a fiscal tightening (loosening) compared with the baseline scenario.

Real side of the economy

The fiscal impulse is supposed to have a direct impact on the real GDP level ($\tilde{Y}$):

$$\tilde{Y}_t = \tilde{Y}_{t-1}\,\frac{\tilde{Y}_t^b}{\tilde{Y}_{t-1}^b}\left(1-\epsilon\left(\sum_{s=0}^{S}\rho^S\,(f_{t-s}-f_{t-s-1})\right)\right)\left(1-\tau\left(d_{t-1}-d_{t-1}^b\right)\right) \tag{3}$$

with f the fiscal impulse as defined in equation (1), ϵ the fiscal multiplier, S an indicator for the persistence (the number of years for which the fiscal impulse affects real GDP), and ρ a discount factor (measuring the strength of persistence of the fiscal multiplier) ([1]). Like Chudik et al. (2017), we assume that a high public debt ratio compared to the baseline adversely affects the level of real GDP (τ).([2]) We assume that this effect only kicks in if public debt under the counterfactual scenario exceeds 60% of GDP.

([1]) The set-up follows Ramey (2019).
([2]) Similarly, Bocola (2015) and Rachel and Summers (2019) assume that the negative impact of public debt on output is channelled via a risk premium. Bocola finds that a 60 bps. quarterly increase in risk premium leads to a 1.1.-1.4% loss in annualised output. Rachel and Summers show that a permanent increase in the level of debt of 1% yields to a permanent decrease of 0.01-0.04% in the level of output.

(Continued on the next page)

Box (continued)

The above equation can be transformed into nominal GDP:

$$Y_t = Y_{t-1}\frac{Y_t^b}{Y_{t-1}^b}\frac{1+\pi_t}{1+\pi_t^b}\left(1-\epsilon\left(\sum_{s=0}^{S}\rho^S\left(f_{t-s}-f_{t-s-1}\right)\right)\right)\left(1-\tau\left(d_{t-1}-d_{t-1}^b\right)\right) \quad (4)$$

with Y the nominal GDP and π the inflation rate.

The output gap is defined as follows:

$$\hat{y}_t = \frac{\tilde{Y}_t}{\tilde{Y}_t^{pot}} - 1 \quad (5)$$

The potential GDP is assumed to be equal to the baseline potential GDP, i.e. $\tilde{Y}^{pot} = \tilde{Y}^{pot\ b}$.

Price effect

The link between the inflation rate and the real side of the economy is modelled via a (backward) Phillips curve ([3]):

$$\pi_t = \lambda\pi_{t-1} + \beta\hat{y}_t \quad (6)$$

where λ and β are parameters measuring the persistence of past inflation and the strength of the pass-through from the output gap respectively.

Interest rate

We define the short-term nominal interest rate on the basis of a Taylor rule ([4]):

$$i_t = i_0 + \gamma\left(\rho_\pi(\pi_t - \pi^*) + \rho_y\,\hat{y}_t\right) \quad (7)$$

with i^0 the central bankers nominal target, π^* its inflation target, ρ_y and ρ_π are parameters for the reaction of the central bank to output gap and inflation respectively and γ the weight of the Member State taken into account the central bank's decision. The weight is 1 if the Member State concerned has a fully independent monetary authority, 0 if its interest rate is pegged to another monetary authority and it corresponds to nominal GDP as a proportion of euro area GDP for euro area Member States.

To compute the government's interest burden, we calculate the sovereign interest rate due on the newly emitted bonds as follows ([5]):

$$si_t = i_t + tp_t^b + rp_t \quad (8)$$

with i the short-term interest rate as defined above, tp the term premium and rp the risk premium. The term premium is defined as the difference between the sovereign interest rate and the short-term rate of Germany and is assumed to be unchanged with respect to the baseline. The risk premium is estimated by applying a panel data approach to a sample of Member States covering the 1998-2019 period, using data from the Commission spring 2019 forecast. In a nutshell, the panel approach assumes that the risk premium depends

([3]) Mankiw and Reis (2002), Gali and Gertler (1999), Gali (2008).
([4]) *Taylor (1993)*.
([5]) Missale and Blanchard (1991), Wolswijk and de Haan (2005), Missale et al. (2002).

(Continued on the next page)

Box (continued)

on past fiscal performance, the economic cycle and country- and time-specific features ([6]). We use the estimated coefficients to predict the risk premium in each year.

As a simplifying assumption, we derive the implicit interest rate as follows (assuming the maturity (m) is long enough):

$$\widetilde{si}_t = \frac{1}{m}\widetilde{si}_t + \frac{m-1}{m}\widetilde{si}_{t-1} \tag{9}$$

Fiscal block

The structural balance is defined as follows:

$$sb_t = sb_t^b + cf_t \tag{10}$$

where *cf* is the cumulated fiscal effort.

We can then link the headline balance, the fiscal impulse and the output gap ([7]):

$$hb_t = hb_t^b + cf + \varepsilon\,(\hat{y}_t - \hat{y}_t^b) \tag{11}$$

and determine the primary balance:

$$pb_t = hb_t^b + ip_t = hb_t^b + d_{t-1}\widetilde{si}_t \tag{12}$$

where ip corresponds to interest payments and *d* refers to the public-debt-to-GDP ratio.

The debt accumulation can then be computed as follows:

$$d_t = pb_t + \frac{1+\widetilde{si}_t}{(1+g_t)(1+\pi_t)}d_{t-1} + sfa_t \tag{13}$$

with $\widetilde{si}$ the implicit (or sovereign) interest rate and g the nominal GDP growth rate. A simplifying assumption is that the stock flow adjustment is identical in the baseline and counterfactual simulation ($sfa_t = sfa_t{}^b$).

The change in debt can be broken down in the following contributions:

$$\Delta d_t = -pb_t + \underbrace{\underbrace{d_{t-1}\frac{\widetilde{si}_t}{(1+g_t)}}_{interest\ \ rate} - \underbrace{d_{t-1}\frac{\tilde{g}_t}{(1+g_t)}}_{real\ \ growt\ h} - \underbrace{d_{t-1}\frac{\pi_t(1+\tilde{g}_t)}{(1+g_t)}}_{inflation\ \ rate}}_{snowball} + sfa_t \tag{14}$$

where $\tilde{g}/g$ corresponds to the real/nominal GDP growth rate ([8]). Note that a higher interest rate contributes to an increase in the debt ratio, while higher real GDP growth and higher inflation erode the debt-to-GDP ratio.

([6]) The dependent variable is defined as the difference between long- and short-term nominal interest rates. It is explained by the following independent variables (*size of estimated coefficient shown in brackets*): (i) difference of lagged public debt ratio from the country-specific mean (*+0.04*), (ii) squared difference of the public debt ratio from 80% of GDP (*+0.004*), (iii) difference between the lagged change in public debt from the debt reduction benchmark, defined as one twentieth of the difference between the lagged public debt and 60% of GDP (*+0.07*), real GDP growth rate (*-0.1*) and country and time dummies. The model is estimated using a LSDV estimator. The R-squared is 0.62.

([7]) Mourre et al. (2019).

(Continued on the next page)

Box (continued)

Calibration

The counterfactual scenarios shown in Graph II.3.5 and II.3.6 are based on the baseline parametrisation (Table 1, column 1). The sensitivity of the results is checked by changing the parameters (Table 1, column 2, 3). The findings appear broadly robust to those changes (Graph II.3.9).

Table 1: **Calibration of counterfactual model**

Block	Parameter	Baseline	Sensitivity	
			low	high
		(1)	(2)	(3)
Real economy	Fiscal multiplier (ϵ)	0.7	0.5	1
	Duration of impact on GDP (S)	3		
	Persistence of multiplier on GDP (ρ)	0.5		
	Pass-through from debt to GDP (τ)	0.001	0.0005	0.0015
Prices	Persistence of past inflation (λ)	0.5		1
	Pass-through from output gap to inflation (β)	0.1	0.05	0.15
Interest rate	Pass-through from inflation to interest rate (ρ_π)	1.5		
	Pass-through from output to interest rate (ρ_y)	0.5		
	Length of maturity (m)	7		

Source:

Solving the model

The model is solved iteratively for each year going forward from 1998 to 2019. In 1998, the simulation and its past values are assumed to be equal to the baseline. Data for the baseline scenario come from the Commission 2019 spring forecast.

Caveats

- While the framework offers a fairly economical formulation and straightforward interpretation, it comes at the expense of a missing micro-foundation.

- There is extensive literature on the value of fiscal multipliers. In particular, the multiplier can vary depending on the channel of the fiscal impulse (revenue vs. spending side) ([9]) or to the phase of the economic cycle ([10]). The model's current set-up does only take the latter into account ([11]).

- The model does not take account of the impact of the fiscal stimulus on long-term growth. By assumption, the deviation from the baseline calculated by the model is part of the business cycle and potential output is unchanged. This does not imply that the fiscal impulse needs to be temporary, but the channels by which it could influence potential growth are not modelled.

([8]) The contribution from the exchange rate effect to debt is assumed to be zero.
([9]) Alesina et al. (2019).
([10]) Auerbach and Gorodnichenko (2012).
([11]) See counterfactual scenario with time-varying multipliers shown in Graph II.3.9. It assumes a fiscal multiplier of 0.5 if the output gap is positive and 1 if the output gap is negative.

3.3. ASSESSING OF STABILISATION PROPERTIES

3.3.1. Approach to assessing the stabilisation properties

The cyclicality of the fiscal effort is assessed using a panel regression model (see Box II.3.3 for a more detailed description). The empirical assessment is conducted based on a fiscal reaction function approach ([104]). The key objective is to assess the economic cycle's impact on the discretionary component of fiscal policy, i.e. the actual fiscal effort. This effort is measured following the methodology of the expenditure benchmark and the structural balance (Box II.3.1). To enable comparison of the size and significance level, the indicators of the fiscal effort are standardised to have a mean of 0 and a standard deviation of 1. The main independent variable is an indicator for the economic cycle. We primarily proxy it with the *level* of the output gap, which corresponds to the key variable determining the speed of fiscal adjustment in the EU fiscal surveillance framework. The findings are broadly robust to the use of the *change* in the output gap ([105]). We also control for the public indebtedness of Member States, EU fiscal rules and additional relevant independent variables in line with the literature. The sample covers data for up to 28 Member States over the period 2000 to 2019. The analysis is based on real-time data from past Commission spring forecast vintages and on *ex-post* data using the Commission spring 2019 forecast.

3.3.2. Main findings

Cyclicality of discretionary fiscal policy

The regression analysis points to the procyclical nature of discretionary fiscal policy, i.e. being expansionary in good times and contractionary in bad times. The findings from the regression analysis reveals that the discretionary fiscal effort is procyclical as shown by the significant and negative coefficient of the contemporaneous output gap (Table II.3.2, columns 1–4). This implies that there has been a tightening of the fiscal effort in bad times and a loosening in good times in the EU on average over the past 20 years. This result turns out to be robust to several sensitivity tests, namely concerning changes of the type of fiscal effort (EB vs. SB), dataset (real time vs. *ex post*), set of control variables, such as the measurement of the economic cycle and (iv) estimation techniques.

Procyclicality of discretionary fiscal policy happens in particular in good times (Table II.3.2). An important question is whether procyclicality occurs throughout the cycle or only during an upturn or downturn. The empirical findings from a panel interaction model show that good times are characterised by a procyclical pattern, whereas bad times exhibit an acyclical pattern.

Apart from the economic cycle, the fiscal effort is driven by public debt ratios, EU fiscal rules, and political-economy factors (Table II.3.2). Higher debt ratios seem to trigger a fiscal tightening to improve the budgetary position. Member States on their adjustment path to the MTO or under an excessive deficit procedure (EDP) implement a stronger consolidation. Election years are in most specifications characterised by a fiscal loosening. Finally, we find evidence that the (initial) years of the Great Recession (2008-2009) resulted in a fiscal loosening ([106]).

Based on our counterfactual scenario, full compliance with the preventive arm would have turned discretionary fiscal policy from procyclical to acyclical (Table II.3.2). We assess the cyclicality of the fiscal effort based on the counterfactual scenario of strict compliance with the preventive arm from the previous chapter (Chapter II.3.2). For that purpose, we use as the dependent variable the fiscal effort required to comply with the preventive arm, which was determined under the counterfactual scenario ([107]). We also use the counterfactual variables of the output gap and the distance towards the MTO, but keep the remaining control variables unchanged compared with the baseline specification. Those counterfactual variables are derived based on *ex-post* data from the Commission spring 2019 forecast. Overall, the findings suggest that strict

([104]) Lane (2003).
([105]) Previous evidence points to the sensitivity of the findings to the type of indicators used to measure the economic cycle (European Commission 2019b).
([106]) See also Braz and Carnot (2019).
([107]) Using the notation introduced in Chapter II.2.3, it corresponds to the sum of the *actual* fiscal effort under the baseline scenario and the fiscal impulse.

Table II.3.2: **Cyclicality of fiscal policy – main regression results**

Specification	Baseline				Good vs. bad times		Counterfactual	
Dependent variable: Fiscal effort	Actual fiscal effort						Required fiscal effort	
	EB	SB	EB	SB	EB	SB	EB	SB
Dataset	Real time (COM SF 2000-19)		Ex post (COM SF 2019)		Real time (COM SF 2000-19)		Ex post (COM SF 2019)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Output gap (t)	-0.176***	-0.103**	-0.161***	-0.144***	-0.156	-0.044	0.040	0.068
	(-5.339)	(-2.372)	(-7.939)	(-5.611)	(-1.571)	(-0.824)	(1.473)	(1.144)
Public debt (t-1)	0.004***	0.007***	0.006***	0.008***	0.004***	0.007***	0.012*	0.002*
	(2.854)	(4.555)	(3.601)	(5.376)	(2.802)	(4.383)	(1.783)	(1.943)
Distance to MTO (t)	0.097***	0.220***	0.125***	0.196***	0.097***	0.224***	0.463***	0.288***
	(2.764)	(5.250)	(3.109)	(4.575)	(2.802)	(5.250)	(4.547)	(5.118)
EDP (t)	0.313**	0.291**	0.103	0.050	0.311**	0.292**	0.291**	0.183*
	(2.302)	-2.003	(0.808)	(0.492)	(2.312)	(2.004)	(2.013)	(1.979)
Election year (t)	-0.002*	-0.001	-0.002**	-0.002*	-0.002*	-0.001	-0.003	-0.000
	(-1.698)	(-0.733)	(-2.190)	(-1.795)	(-1.776)	(-0.646)	(-1.183)	(-0.114)
Crisis dummy 2008-09	-0.897***	-2.170***	-1.628***	-1.292**	-0.700**	-1.518***	-0.373	-0.359
	(-3.386)	(-5.419)	(-4.123)	(-2.172)	(-2.263)	(-4.269)	(-1.479)	(-1.394)
Dummy good times (t)					0.029	0.226		
					(0.217)	(1.455)		
Output gap * good times					-0.114	-0.200		
					(-1.624)	(-1.330)		
# countries	28	28	28	28	28	28	28	28
# observations	470	472	490	492	470	472	471	471
Impact of output gap in:								
- good times (size)					-0.279**	-0.245**		
- good times (p-value)					0.044	0.04		
Wald test time dummies	0	0	0	0	0	0	0	0
AR(1) (p-value)	0.001	0	0	0	0.001	0.000	0	0
AR(2) (p-value)	0.64	0.917	0.205	0.267	0.646	0.828	0.653	0.405
Hansen (p-value)	0.583	0.715	0.932	0.708	0.928	0.91	0.672	0.578
# instruments	29	29	29	29	33	33	29	29

Note: Estimations are based on the first-difference GMM (FD-GMM) estimator following Blundell and Bond (1998), where we consider the output gap and the distance to the MTO to be endogenous. Due to the small sample size, the set of internal instrumental variables is restricted to up to 2 lags and the matrix of instruments is then 'collapsed'. The standard errors are corrected following Windmeijer (2005). AR(1,2) and Hansen tests confirm the validity of the GMM specifications (Roodman 2009a, b). ***, ** and * denote statistical significance at 1%, 5% and 10%, respectively.

compliance would have led to an acyclical pattern of the discretionary fiscal effort (Table II.3.2, column 5, 6). Those results can be explained by two factors: First, the matrix would have modulated the requested fiscal effort across the economic cycle for Member States on their adjustment path to the MTO, i.e. requesting a higher (lower) effort in good (bad) times. Second, Member States at their MTO would have stayed at the MTO by compensating for the negative and positive deviations from the MTO under the baseline scenario.

Cyclicality of the fiscal effort: expenditure benchmark vs. structural balance

The actual fiscal effort as measured based on the expenditure benchmark appears more reactive to the economic cycle than the fiscal effort measured based on the structural balance. The procyclicality of the *actual* fiscal effort appears smaller (size of coefficient) and weaker (significance level) when based on the structural balance than when based on the expenditure benchmark methodology ([108]). One main reason for this is the smoothing of potential growth: In good times, annual potential growth tends to be higher than the 10-year average. Everything else unchanged, this tightens the *actual* fiscal effort based on the structural balance, but leaves the *actual* fiscal effort as measured with the expenditure benchmark methodology unchanged. This means that the lower procyclicality of the *actual* fiscal effort of the structural balance is driven by the measurement of the fiscal effort.

Applying those findings to fiscal surveillance, the expenditure benchmark appears the more effective indicator to reduce procyclicality. The findings suggest that for Member States it is more

([108]) This finding is robust to changes to the measure of the output gap, set of independent variables, estimation techniques and datasets (Tables II.3.2 and II.3.3).

Table II.3.3: **Cyclicality of fiscal policy – sensitivity analysis**

Type of sensitivity	Set of independent variables						Estimators			
Dependent variable	Actual fiscal effort									
	EB	SB	EB	SB	EB	SB	EB	SB	EB	SB
Economic cycle	Change in output gap		Level of output gap							
Estimator	FD-GMM	FD-GMM	FD-GMM	FD-GMM	FD-GMM	FD-GMM	LSDV	LSDV	SYS-GMM	SYS-GMM
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Output gap (t)			-0.173***	-0.052*	-0.192***	-0.057*	-0.124***	-0.011	-0.159***	-0.128*
			(-5.226)	(-1.949)	(-5.036)	(-1.934)	(-5.818)	(-0.327)	(-3.181)	(-1.812)
Public debt (t-1)	0.002*	0.006***	0.004***	0.007***	0.005***	0.008***	0.009***	0.003	0.004*	0.004**
	(1.959)	(2.892)	(2.831)	(4.547)	(3.009)	(3.899)	(3.385)	(0.274)	(1.848)	(2.312)
Distance to MTO (t)	0.106**	0.208***	0.099***	0.221***	0.157***	0.244***	0.163***	0.236***	0.098**	0.112
	(2.174)	(6.134)	(2.770)	(5.243)	(3.996)	(4.110)	(7.169)	(9.361)	(2.048)	(1.589)
EDP (t)	0.307**	0.313**	0.319**	0.293**	0.300**	0.327**	0.214*	0.262*	0.340*	0.741**
	(2.372)	(2.402)	(2.392)	(2.039)	(2.226)	(2.149)	(1.675)	(1.799)	(1.746)	(2.419)
Crisis dummy 2008-09	-0.210	-0.918**			-0.374	-1.846***	-0.298	-1.381***	-1.089	-1.537***
	(-0.616)	(-2.447)			(-1.402)	(-4.190)	(-0.837)	(-4.344)	(-1.487)	(-3.263)
Election year (t)	-0.002*	-0.000			-0.003***	-0.001	-0.001	-0.000	-0.002	-0.001
	(-1.786)	(-0.132)			(-2.688)	(-0.607)	(-1.302)	(-0.489)	(-1.234)	(-1.584)
Change in output gap (t)	-0.118**	-0.020								
	(-2.377)	(-0.354)								
Age dependency ratio (t-1)					0.005***	0.014***				
					(2.606)	(3.454)				
Current account (t-1)					0.037	-0.001				
					(1.441)	(-0.026)				
# countries	28	28	28	28	28	28	28	28	28	28
# observations	470	472	470	472	423	425	470	472	470	472
R-squared							0.448	0.455		
Wald test time/country dummies	0	0	0	0	0	0	0 / 0.004	0 / 0	0	0
AR(1) (p-value)	0.001	0	0.001	0	0.001	0			0.001	0.058
AR(2) (p-value)	0.182	0.824	0.589	0.901	0.391	0.353			0.612	0.218
Hansen (p-value)	0.376	0.854	0.473	0.538	0.81	0.734			0.783	0.715
# instruments	29	29	28	28	33	33			29	29

Note: Estimations are based on the real-time database. The following estimation techniques are used: Least square dummy variable estimator using heteroskedasticity-robust standard errors (LSDV), first-difference GMM (FD-GMM) and system-GMM (SYS-GMM) estimators following Blundell and Bond (1998), where we consider the output gap and the distance to the MTO to be endogenous. Due to the small sample size, the set of internal instrumental variables is restricted to up to 2 lags and the matrix of instruments is then 'collapsed'. The standard errors are corrected following Windmeijer (2005). AR(1,2) and Hansen tests confirm the validity of the GMM specifications (Roodman 2009a, b). ***, ** and * denote statistical significance at 1%, 5% and 10%, respectively.

demanding in good times to comply with the required fiscal effort of the expenditure benchmark than with the structural balance methodology. In bad times, by contrast, it is less demanding to comply with the required effort as measured with the expenditure benchmark than to fulfil the structural balance requirement. Put differently, the expenditure benchmark appears the more effective indicator to reduce the procyclicality of the fiscal effort than the structural balance.

Modifying the definition of the *actual* fiscal effort

Modifying the definition of the actual fiscal effort can have an impact on the cyclicality (Graph II.3.10). To assess the impact of different measures of the *actual* fiscal effort, we rerun our baseline regression (see columns 1 and 2 of Table II.3.2). Overall, the findings suggest that the more procyclical the measurement of the *actual* fiscal effort, the more demanding it is for Member States to meet the *required* fiscal effort in good times and the more effective this indicator is in reducing procyclicality.

- ***Expenditure aggregate***: Procyclicality would be smaller if discretionary revenue measures, cyclical unemployment benefits and one-offs were *not* subtracted from the expenditure aggregate. The reason for this is that these components tend to increase the modified expenditure aggregate in bad times (decrease in good times), implying, *ceteris paribus*, a lower (higher) actual fiscal effort. In terms of one-offs, the relatively large confidence bands point to an increased uncertainty of the findings. By contrast, public investment tends to be cut in particular in bad times. This means that procyclicality would be higher if public investment were not subtracted from the expenditure aggregate. Interest payments and EU funds do not have a major impact on the procyclicality of the fiscal effort.

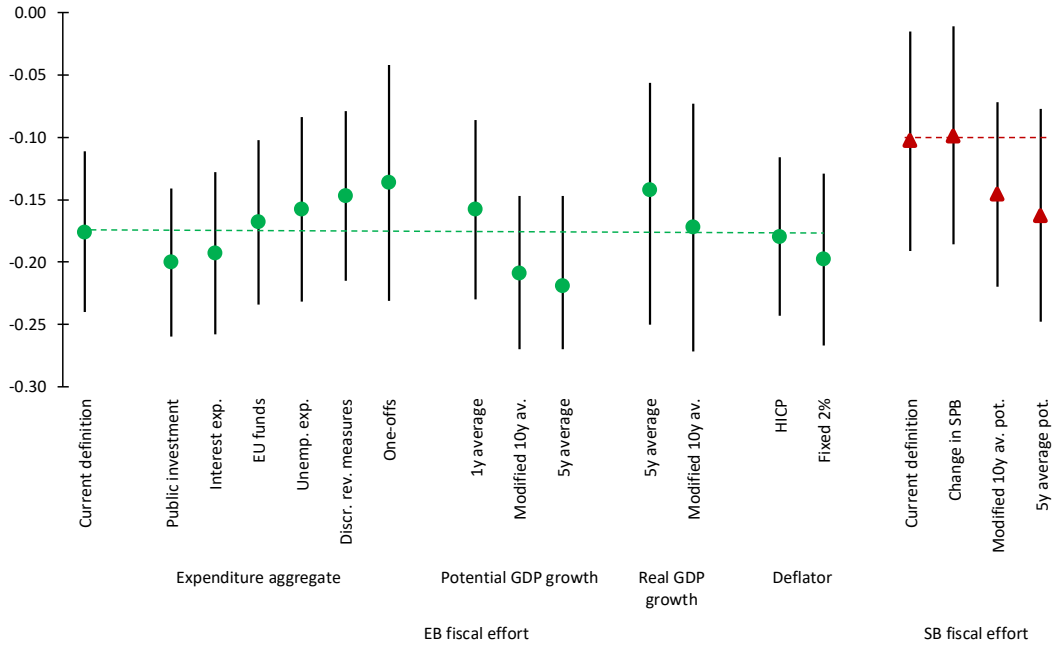
- ***Potential GDP***: The procyclicality of the fiscal effort would be reduced if potential growth

were measured with an annual average growth rate. By contrast, procyclicality would be slightly increased if a 5-year or modified 10-year average growth would have been used. The latter gives less weight to the forward-looking dimension ([109]).

- ***Real GDP***: The procyclicality of the fiscal effort would be similar if a modified 10-year average real GDP growth rate would have been used. By contrast, procyclicality would have been reduced if real GDP growth were measured with a 5-year average growth rate.
- ***Deflator:*** Using a fixed 2% inflation rate to deflate real potential growth would increase the procyclicality, since it would lead to a higher fiscal effort in good times (assuming the inflation rate exceeds 2%) and a lower effort in bad times (below 2% inflation). Changing the definition to HICP inflation would only have a minor impact.
- ***Structural balance***: We also checked the impact of alternative definitions of the structural balance on the cyclicality of the actual fiscal effort. The results show that netting out interest payments would have had no significant impact on the procyclicality of the change in structural balance. By contrast, the procyclicality would increase significantly, if potential GDP growth was measured with a longer-term average. Overall, the main change between the cyclicality of the fiscal effort based on the structural balance and the expenditure benchmark methodology can be explained by differences in the definition of potential growth.

Some caveats remain. In particular, like for every cross-country panel approach, the results reveal relationships, which are valid only on average across Member States, but may differ from one Member State to another.

Graph II.3.10: **Modulations of the definition of the actual fiscal effort on cyclicality (EU, 1999-2019)**



Note: The chart shows the size and confidence intervals of the estimated coefficients of the output gap for different definitions of the expenditure benchmark and the structural balance. The same specification and estimation technique is used as in Table II.3.2, columns 2 and 3. The more negative the estimated coefficient, the higher the procyclicality of the actual fiscal effort, i.e. the more effective the indicator for fiscal surveillance in reducing procyclicality. The following modifications are assessed: expenditure aggregate: assume that the five listed components are not netted out from the modified expenditure benchmark. Potential GDP growth: Instead of using the 10-year average potential GDP growth (based on the growth rates from t-5 to t+4) use: (i) annual potential GDP growth, (ii) 5-year potential growth (t-3, …, t+1), (iii) modified 10-year potential GDP (t-8, …, t+1). Real GDP growth based on (i) 5-year average and (ii) modified 10-year average (t-8, …, t+1). Deflators: Instead of using the GDP inflation use (i) HICP inflation, (ii) fixed 2% inflation rate in line with the ECB's medium-term price stability objective.

([109]) The modified 10-year average is based on the data from t-8 to t+1 compared with the current definition, which is based on the average of t-5 to t+4.

Box II.3.3: Assessing stabilisation properties – a panel regression exercise

This box describes how the stabilisation properties of the actual fiscal efforts are assessed ([1]). Procyclical fiscal policies, that is policies that are expansionary in booms and contractionary in recessions, are generally regarded as potentially damaging for welfare, since they can increase macroeconomic volatility, hamper growth and depress investment ([2]).

Existing evidence points to a rather procyclical pattern of discretionary fiscal policy in the EU. There is a rich literature assessing the cyclicality of fiscal policy. In a nutshell, the studies conclude that total fiscal policy (i.e. including automatic stabilisers) is rather acyclical or countercyclical, while *discretionary* fiscal policy appears to be procyclical ([3]). The role of the reinforced EU fiscal rules on cyclicality has only scarcely been investigated. The sparse evidence suggests that compliance with the rules of the preventive arm reduces pro-cyclicality, notably if debt is below 60% of GDP ([4]). Conversely, having high debt levels tends to amplify pro-cyclicality.

The cyclicality of the fiscal effort is investigated using a panel data approach. The analysis concentrates on up to 28 EU Member States (i) and 20 years (*t*), covering the period 2000 to 2019. We primarily use real-time data from past Commission spring forecast vintages ([5]), but also analyse the findings with *ex-post* data from the Commission spring 2019 forecast ([6]).

The key drivers of the actual fiscal effort are determined with a fiscal reaction function approach. Such an approach has been used extensively in the literature for assessing the behaviour of fiscal variables over the economic cycle ([7]). The specification looks as follows:

$$effort_{i,t} = \beta_1\, cycle_{i,t} + \beta_2\, debt_{i,t-1} + \beta_3\, X_{i,t-1} + \theta_t + \vartheta_i + u_{i,t} \qquad (1)$$

where the dependent variable corresponds to the actual fiscal effort used in the preventive arm of the SGP (Box II.3.1). To enable comparison across different indicators, we standardise the different measures for the fiscal effort with a mean of 0 and a standard deviation of 1. X is a vector including additional control variables derived from the literature (see below). The specification includes year- (θ) and country-fixed effects (ϑ) to capture systematic differences across Member States and time, while u represents an error term.

We include a set of relevant independent variables to prevent an omitted variable bias. The expected sign with respect to the fiscal effort is shown in brackets, while +/- corresponds to a fiscal tightening/loosening ([8]):

- **Economic cycle (-/~/+)**: Existing studies point to the sensitivity of the findings to the choice of the economic cycle variable ([9]). In line with the key rationale of the SGP and a dominant part of the

([1]) A similar set-up is chosen as in European Commission (2019b).
([2]) Manasse (2006).
([3]) Woo (2009), Checherita-Westphal and Žďárek (2017), Baldi and Staehr (2016). The findings by Eyraud et al. (2017) indicate acyclical fiscal policy based on Member States plans, but procyclical fiscal policy based on real-time and *ex-post* data.
([4]) European Commission (2019b).
([5]) Cimadomo (2012, 2016).
([6]) We focus on real-time data from the Commission spring forecasts. The findings are, however, very similar when based on real-time data from the Commission spring forecasts.
([7]) Lane (2003).
([8]) Note that most papers assess the impact of the explanatory variables on the level of the cyclically-adjusted budget balance not the fiscal effort; see in particular Checherita-Westphal and Zdarek (2017), Golinelli and Momigliano (2006).
([9]) European Commission (2019b).

(Continued on the next page)

Box (continued)

literature, we measure the cycle with the level of the contemporaneous output gap. We checked the sensitivity using the change in the output gap ([10]).

- **Public debt (+)**: Public gross debt of the general government is included to control for the budget constraint of Member States.

- **EU fiscal rules (+)**: We control for the distance of Member States to the medium-term budgetary objective (MTO), since the preventive arm requests Member States to reach their MTO. It is defined as the difference between the lagged structural balance and the MTO. Positive values imply that Member States still have to consolidate to reach their MTO. We also include a dummy variable for Member States under the excessive deficit procedure (EDP).

- **Political economy channel**: We control for the election year (-) to account for the well-established political economy literature ([11]). We also tried additional variables such as partisanship, but they turned out to be insignificant and are therefore omitted.

- **Great Recession (-)**: Controlling for the economic and financial crisis is debatable. On the one hand, you may not want to control for it, since it represents the major cyclical episode within the sample, for which the test on cyclicality should be conducted. On the other hand, you may want to control for it, since it represents a very atypical cyclical episode, namely the deepest crisis since World War II. While we focus in this part on specifications including a dummy for the (initial) years of the Great Recession (2008 and 2009), the results are broadly unchanged when excluding it.

- Additional **macroeconomic and demographic** factors (such as current account balance (+) and percentage of the total population over 65 years old) did not change the findings significantly and were therefore omitted in the baseline specification.

We use an interaction model to test for the impact of the phase of the cycle on the cyclicality of the fiscal effort:

$$effort_{i,t} = \beta_2\, cycle_{i,t} + \beta_3\, debt_{i,t-1} + \beta_4\, X_{i,t-1} + \beta_5\, dummy_{i,t} \cdot cycle_{i,t} + \beta_6\, dummy_{i,t} + \theta_t + \vartheta_i + u_{i,t} \quad (2)$$

where the dummy variable defines the phase of the cycle, i.e. good versus bad times. From equation (2) we can derive the marginal effect: it measures how a marginal change of the output gap impacts the fiscal effort in good vs. bad times:

$$\frac{\partial\, effort}{\partial\, cycle} = \beta_2 + \beta_5\, dummy_{i,t} \quad (3)$$

Equation (3) shows that the marginal effect depends on the value of the conditioning dummy variable. The marginal effect is defined as $\beta_2 + \beta_5$ in case of good times (i.e. the dummy variable is equal to 1), whereas it simplifies to β_2 in bad economic times (i.e. the dummy variable is 0). We report the standard errors for both events based on the variance-covariance matrix ([12]).

([10]) We do so for at least two reasons. First, the change of the output gap is typically less affected by revisions than its level. Second, the output gap is typically computed by utilising information from periods ahead (e.g. mechanical assumptions on its speed of closure). This has a significant impact for our study when using the real-time dataset from the Commission spring 2019 forecast, since the estimates of the output gap in the pre-crisis period are severely affected by the subsequent downturn. Using the change rather than the level of the output gap mitigates this problem to some extent.
([11]) Buchanan and Wagner (1977).
([12]) For the specification and interpretation of interaction terms see Brambor et al. (2006), Braumoeller (2004).

3.4. ASSESSING OF PREDICTABILITY

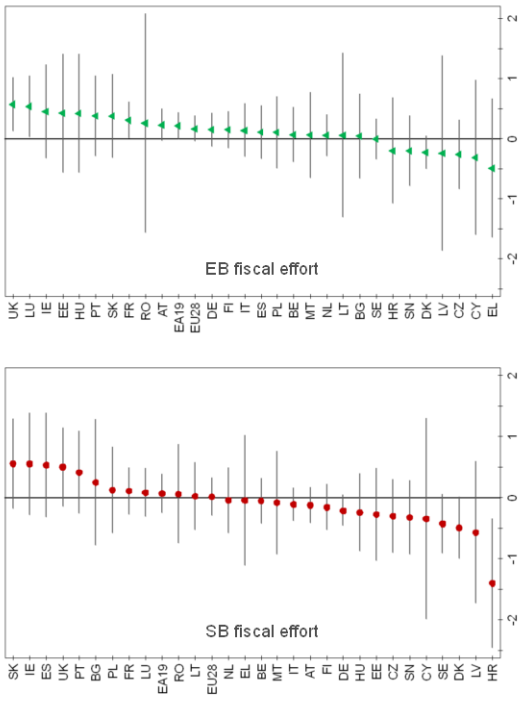
3.4.1. Approach to assessing predictability

We assess the predictability of the actual fiscal effort with the help of a forecast *post-mortem* exercise (see Box II.3.4 for further details on the methodology). The analysis focuses on the one-year ahead forecast error, which is highly relevant for the fiscal surveillance process. It is defined as the difference between the forecast made in autumn of the preceding year and the realised (outturn) value made in spring of the next year. As a result, a positive (negative) forecast error means that the fiscal effort turned out to be smaller (higher) than expected, implying a negative (positive) surprise. We compute the forecast errors for Member States using real-time data from Commission forecast vintages between autumn 2000 and spring 2019.

3.4.2. Main findings

Forecast bias

Graph II.3.11: **Test for unbiasedness of the fiscal forecast**

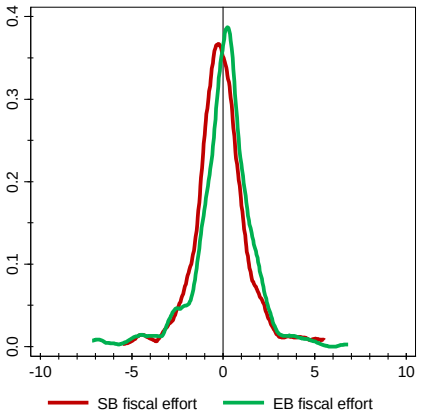


Note: The tests are based on the one-year ahead forecast errors based on the autumn forecast.

Our analysis shows that the forecast of the fiscal effort by the Commission is unbiased (Graph II.3.11). We ran standard simple tests for bias in the Commission's forecast by regressing the forecast error on a constant and testing if this constant is statistically different from zero (Box II.3.3). A positive (negative) value implies that the fiscal effort has been overestimated. This implies that the fiscal effort turned out to be smaller (larger) than expected, corresponding to a negative (positive) surprise. Our findings show that the forecast of the fiscal effort does not show a significant bias for the EU and the euro area as a whole. The results on the unbiasedness broadly confirm similar tests conducted in 2012 ([110]).

Quality of forecast

Graph II.3.12: **Kernel distribution of one year-ahead forecast error of the fiscal efforts (EU Member States, 2000-2019)**

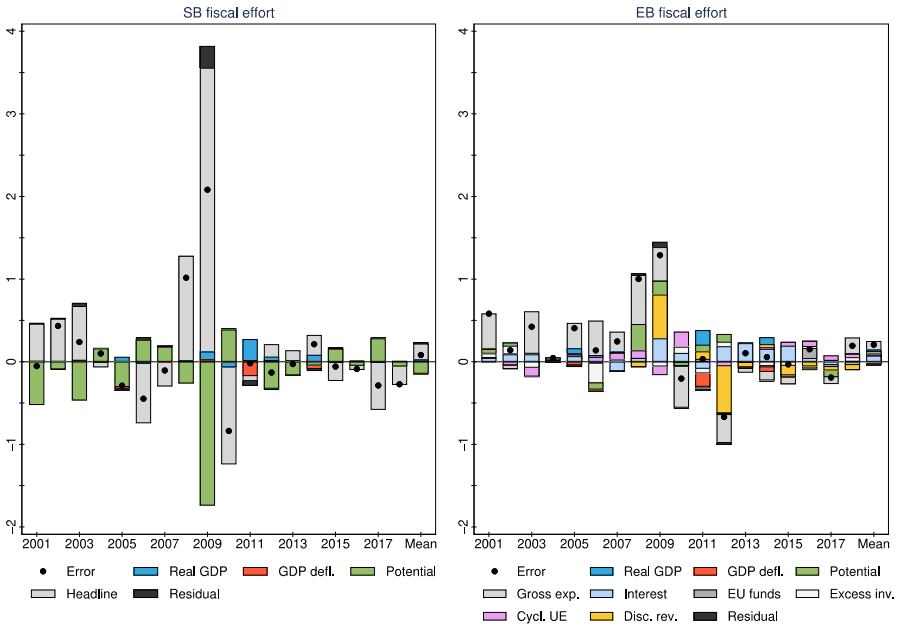


Note: A positive (negative) forecast error corresponds to an overestimation (underestimation) of the fiscal effort, implying a negative (positive) surprise. Moments of the distribution of the EB fiscal effort (SB fiscal effort) are: mean 0.1 (0.0), modus (0.1 (-0.1), standard deviation 1.3 (1.3), coefficient of skewness (the more negative, the further the tail is on the left side of the distribution) -1.6 (0.4) and kurtosis (the higher, the more frequent extreme values or outliers) 11.1 (6.7).
Source: European Commission forecast across different forecast vintages.

The distribution of forecast errors is broadly similar for the actual fiscal effort based on the expenditure benchmark and structural balance methodology (Graph II.3.12). The mean error of the actual fiscal effort based on the expenditure benchmark (structural balance) exceeds 0.5 in around 20% (30%) of the cases, and is below -0.5 in around 35% (25%) of the cases. The actual fiscal effort based on the expenditure benchmark is

([110]) González et al. (2012).

Graph II.3.13: **Decomposition of mean error by components (EU, one-year ahead autumn forecast)**



Note: A positive (negative) forecast error corresponds to an overestimation (underestimation) of the fiscal effort, implying a negative (positive) surprise. Decomposition is based on the methodology described in Box II.3.4.

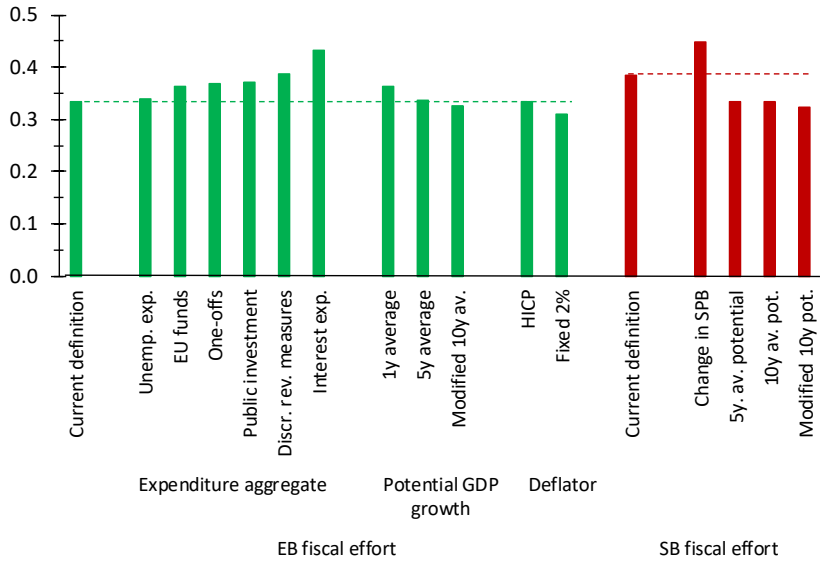
slightly right-skewed, whereas it is slightly left-skewed based on the change in the structural balance. The fiscal effort based on the structural balance is more tilted towards positive surprises, since it can, in contrast to the expenditure benchmark, benefit from revenue or interest windfalls.

Decomposing the actual fiscal effort provides insights into the main drivers of the forecast error (Graph II.3.13**).** For the change in structural balance forecast error, the contributions of headline deficit and output gap forecast error stemming from potential GDP estimation tend to offset one another. Times when the output gap variation is lower than expected because of potential growth revision, contributing negatively to the change in structural balance forecast error (for example in 2009), are times when the headline balance is also lower than expected and contributes positively to the structural balance forecast error. The structural balance is therefore more robust to forecast error than the headline balance. On the other hand, expenditure benchmark forecast error appears less robust to forecast error than the uncorrected growth of expenditure forecast error. Between 2010 and 2015, both the expenditure growth and the discretionary revenue measures forecast error contributed negatively to the fiscal effort forecast effort according to the expenditure benchmark, because the gross of expenditure was lower than expected and discretionary measures where higher than expected.

Modifying the definition of the actual fiscal effort

The forecast error is sensitive to modifications in the expenditure benchmark definition (Graph II.3.14). We assess the impact of changing the expenditure benchmark definition on the size of the forecast error. We focus on the mean absolute error, which provides an indication for the margin of error. In terms of changing the definition of the modified expenditure aggregate, adding additional components increases the forecast error. As regards changes in the potential GDP, we find that using the 1- or 5-year potential growth rate would increase the forecast error, whereas the modified indicator of 10-year potential growth, which is less dependent on forecast years, would slightly lower the forecast error. Finally, in terms of deflators, inflating the potential with a fixed 2% would reduce the forecast error. We also assessed

Graph II.3.14: **Impact of modifications of the fiscal effort on the forecast error (EU, 2000-2019)**



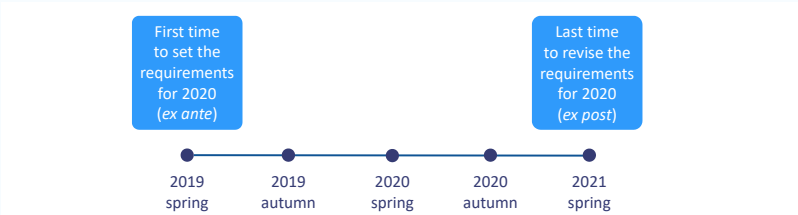
modifications of the change in the structural balance. We find that netting out interest payments would slightly increase the forecast error. By contrast, using a structural balance indicator based on the 10-year potential growth would lower the forecast error.

Box II.3.4: **Assessing predictability – a forecast error analysis**

This box describes how the predictability of the fiscal effort is assessed.

The analysis focuses on the one-year ahead forecast error of the actual fiscal effort, which is highly relevant for the EU fiscal surveillance process. Member State compliance with the fiscal requirements of the preventive arm of the SGP for a given year is assessed five times over the surveillance cycle (Graph 1). The first assessment is conducted in spring for the year ahead (*ex-ante* assessment), the time when the fiscal requirement is set. Subsequently, compliance is assessed in autumn of the preceding year and in spring and autumn of that year (in-year assessment). The final assessment is made in spring of the next year based on outturn data (*ex-post* assessment). It is this final assessment that can trigger the significant deviation procedure, which for euro area Member States can also lead to sanctions.

Graph 1: **Assessing Member States' compliance with the preventive arm of the SGP: An illustration for the 2020 surveillance cycle**



Definition of forecast error

The one-year ahead forecast error of the actual fiscal effort for Member State i for year t is defined as the difference between the forecast made in autumn of the preceding year and the realised value made in spring of the next year. Formally:

$$e_{i,t}^{AF,t+1} = actual\ effort_{i,t}^{AF,t-1} - actual\ effort_{i,t}^{SF,t+1}$$

where a superscript indicates the year of publication of the figure, while a subscript refers to the year to which the value applies ([1]). Hence, positive errors indicate an overestimation, whereas negative ones point to an underestimation of the true value. In the specific case of the fiscal effort, positive errors correspond to negative surprises (fiscal effort is looser than expected), while negative ones correspond to positive surprises (fiscal effort is stronger than expected). The forecast errors are assessed over the period 2000 to 2019 based on the Commission forecasts, which are published in autumn and spring. We primarily focus on the one-year ahead forecasts from autumn, since they include the budget measures for the next year.

Bias of forecasts

In order to test whether the Commission forecasts are systematically biased, the forecast errors are regressed on a constant (α):

$$e_{i,t}^{AF,t+1} = \propto_i + \varepsilon_{i,t}^{AF,t+1}$$

where $e_{i,t}^{t+1}$ stands for the one year-ahead forecast errors for Member State i at time t and ε for an independently and identically distributed error term. In the absence of bias $\propto_i = 0$. The bias is investigated for each Member State as well as for the euro area and EU aggregates.

([1]) Beetsma et al. (2009).

(Continued on the next page)

Box (continued)

Quality of forecasts

The quality of forecast errors is assessed with two indicators. First, the mean error (*ME*) estimates the bias (over- vs. underestimation). It is defined as the average forecast error for each Member State *i* over a given period *T*. Positive and negative errors can offset each other. Formally:

$$ME_i = \frac{1}{T} \cdot \sum_{t=1}^{T} e_{i,t}^{SF,t+1}$$

Second, the mean absolute error (*MAE*) provides information on the margin of error. It is defined as the average of the absolute values of the forecast errors for each Member State *i* over a given period *T*. Errors are equally weighted in the average whatever their size and negative errors cannot cancel positive ones. Formally:

$$MAE_i = \frac{1}{T} \cdot \sum_{t=1}^{T} \left| e_{i,t}^{SF,t+1} \right|$$

The forecast errors are computed for 28 Member States and for the euro area and European Union (EU) aggregates. For the EU and the euro area, the aggregate reflects the changing composition over time.

Decomposition of forecast error

Understanding the sources of the fiscal effort forecast errors is important to assess the strength and weaknesses of fiscal indicators used in the fiscal surveillance exercise. Therefore, we compute the contributions (all other things being equal) of the forecast error of each fiscal and macroeconomic variable to the overall fiscal effort forecast error.

Formally, let the fiscal effort in year t be a function of fiscal and macroeconomic variables $X_{i,1,t}, \dots, X_{i,n,t}$.

$$actual\ effort_{i,t} = F\left(X_{i,1,t}, \dots, X_{i,n,t}\right)$$

The forecast error can be decomposed into the contributions of each of the $X_{i,j,t}$ even when $F(.)$ is not a linear function. We define $e_{X_{i,j,t}}^{AF,t+1}$, the forecast error of variable $X_{i,j,t}$, as the difference between the forecast made in autumn of the preceding year and the realised value made in spring of the next year. Formally:

$$e_{X_{i,j,t}}^{AF,t+1} = X_{i,j,t}^{AF,t-1} - X_{i,j,t}^{SF,t+1}$$

We assume that these errors are close to zero, which allows us to write the approximation of the fiscal effort forecast error to the first-order as follows:

$$e_{i,t}^{AF,t+1} = \sum_{j=1}^{n} e_{X_{i,j,t}}^{AF,t+1} \frac{\partial F}{\partial X_{i,j,t}} \left(X_{i,1,t}^{AF,t-1}, \dots, X_{i,n,t}^{AF,t-1}\right) + v_{i,t}^{AF,t+1}$$

where $v_{i,t}^{AF,t+1}$ is an unexplained residual contribution, which could be non-negligible if forecast errors are large. Computing the decomposition only requires computing the partial derivatives of function $F(.)$ with respect to each of the variables, evaluated at the forecast. Note that if a variable contributes positively to the fiscal effort forecast error, it means that the variable contributes to a lower than expected fiscal effort. For a variable that enters positively into the calculation of the fiscal effort ([2]), the variable was lower than expected.

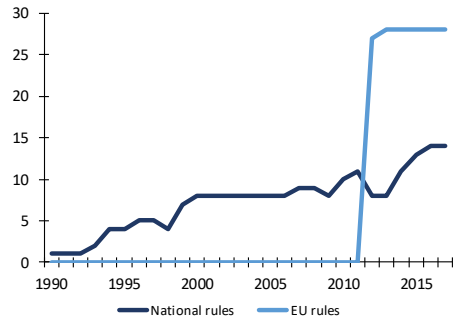
([2]) This means the partial derivative of the fiscal effort with respect to that variable is positive.

4. PERFORMANCE OF SPENDING RULES AT NATIONAL LEVEL

As more Member States have adopted domestic expenditure rules in recent years, a close look at the way these rules have performed in the EU is warranted. Drawing on the evidence provided by the Commission's Fiscal Governance Database (FGD), this Chapter provides some details on the expenditure rules adopted in the Member States, looking at their design features and compliance. This part then investigates if these rules seem to contribute to a reduction of procyclicality.

4.1. STYLISED FACTS

Graph II.4.1: **Adoption of expenditure rules in the EU**

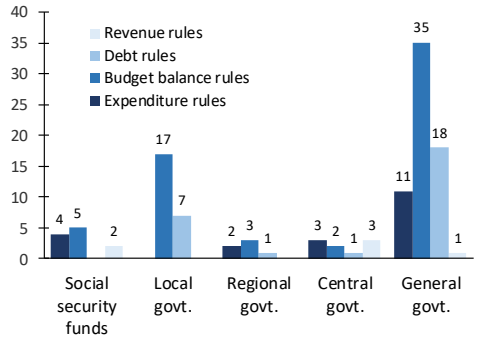


Note: National rules include those covering the general government (GG) and central government (CG).
Source: Commission Fiscal Governance Database.

Over the last 20 years, the adoption of national expenditure rules has proceeded at an uneven pace. As with other national rules, Member States started adopting expenditure rules already in the 1990s (Graph II.4.1). By the early 2000s, expenditure rules were in place in eight Member States ([111]). Over the 2000s, new rules are introduced, some are abandoned or modified, usually in response to the financial crisis and its ensuing strains on public finances. After that period, expenditure rules display a marked increase, and some revisions, with in most cases, new or revised rules mirroring either fully or in some aspects the EU 'expenditure benchmark' (Box II.2.2).

([111]) These are Germany (1990), Denmark (1994), the Netherlands (1994), Sweden (1996), Finland (1999), Luxembourg (1999), Austria (1999) and Ireland (2000). Belgium adopted an expenditure rule in 1993, but then abandoned it in 1998.

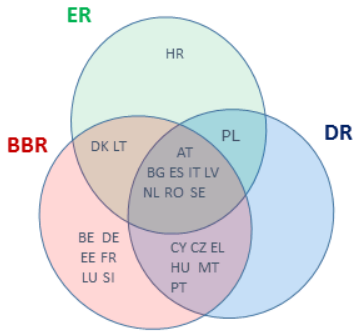
Graph II.4.2: **Types of national fiscal rules and coverage (EU, 2017)**



Source: Commission Fiscal Governance Database.

National expenditure rules in the EU mostly cover the general government and coexist with other rules at national level. In 2017, 14 Member States had expenditure rules in place, making up a total of 20 rules. Within these, 14 rules cover general and central governments (Graph II.4.2). In many Member States expenditure rules are in place and operate jointly with other national rules, such as budget balance rules and debt rules (Graph II.4.3).

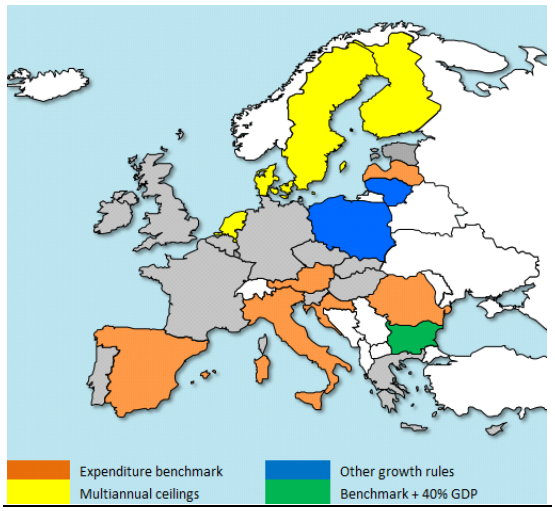
Graph II.4.3: **National expenditure rules (2017)**



Note: BBR – budget balance rule, ER – expenditure rule, DR – debt rule. GG and CG rules in place; NL also has a revenue rule.
Source: Commission Fiscal Governance Database.

National expenditure rules have various specifications (Graph II.4.4**) and coverage of expenditure items (Graph** II.4.5**)**. Out of the 14 rules at the general and central government levels,

Graph II.4.4: **Geographical distribution of expenditure rules in the EU (2017)**



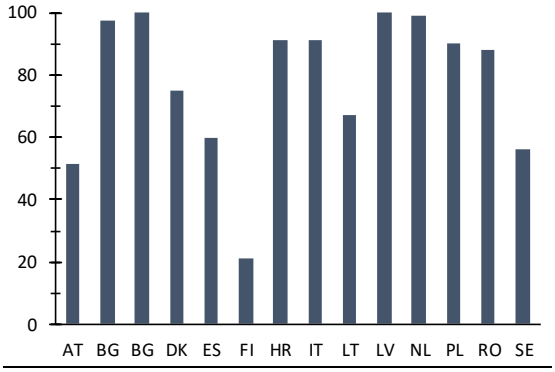
Note: Only rules covering the general and central government.
Source: Commission Fiscal Governance Database.

- Seven national rules mirror the expenditure benchmark (AT, BG, ES, HR, IT, LV, RO). While the required growth rate of expenditure is in line with that specified in EU law, the targeted expenditure aggregate may differ ([112]). Both Austria and Spain, for example, exclude social security spending from the aggregate (corresponding to about 38% of total expenditure in Austria and 40% in Spain);

- Four rules are multiannual expenditure ceilings, set for a multi-year horizon and covering a large part of expenditure (DK and NL for general government, FI and SE for the central government). These ceilings exclude some items from the targeted aggregate such as interest payments, unemployment benefits, and allows for some revisions due to a change in government, or price and wage developments or technical corrections;

([112]) As a reminder, the EU expenditure benchmark targets an aggregate of expenditure, which excludes the following items: interest spending, expenditure on EU programmes fully matched by EU funds revenue and cyclical elements of unemployment benefit expenditure. In addition, investment spending is averaged over a four-year period to smooth the impact of any large investment projects.

Graph II.4.5: **Coverage of national expenditure rules**



Note: Only rules covering the general and central government.
Source: Commission staff calculations based on the Fiscal Governance Database.

- Three others (BG, LT, PL) are rules with own specific design. In Poland, the expenditure aggregate, while netting out spending matched by EU funds and other grants, also excludes all expenses of government units that do not generate high deficits. This aggregate is then set to grow in line with medium-term growth. Bulgaria targets a 40% of GDP ceiling for total nominal expenditure. In Lithuania, the expenditure rule establishes that if the general government balance is in deficit on average over the last five years, the annual growth rate of total expenditure should not exceed half of the average multiannual growth rate of potential GDP.

Expenditure rules tend to be legally binding and subject to independent monitoring, while the provision of escape clauses is limited. As documented in the Commission's FGD, expenditure rules, like other fiscal rules, are introduced along with a series of institutional features aimed at strengthening their performance. Among these features are:

- The *legal status of the statutory basis*: For 10 out of the 14 rules in force which cover the general and central government, the statutory basis is at the highest possible level, either at a constitutional level or at a higher level than ordinary law. Another three rules are established by ordinary law (LV, PL, SE), and one by a coalition agreement (FI).

- The *existence of a monitoring body*: Domestic independent fiscal institutions (IFIs) monitor

almost all rules, with only one rule monitored by the Court of Auditors (PL).

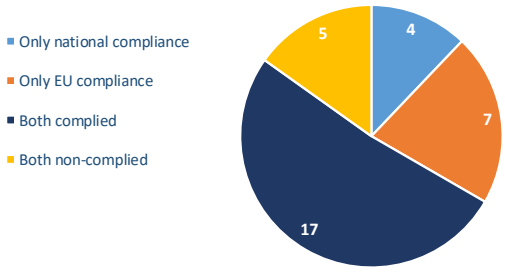
- *A correction mechanism in case of non-compliance*: For four rules (FI, LV, PL, RO) there is no legally pre-defined correction action and for two rules the action is not automatic but it is legally defined (IT, NL). For all other rules, the correction is triggered automatically after non-compliance is detected.

- The option to invoke *escape clauses* in some difficult conditions to enhance resilience to shocks while not compromising the credibility of the rule: only two rules allow the option to invoke them (LV, PL).

This analysis gathers data on simple and numerical compliance for national expenditure rules over the period 2011-2017, based on national sources. First, this analysis focuses on simple numerical compliance, which provides an indication on whether targets have been met. It does not look at legal compliance, where instead additional information plays a role, like escape clauses of flexibility. Also, the analysis is primarily focused on *national* fiscal rules, making reference to *EU* rules only loosely. Hence, no implications on EU fiscal surveillance can be drawn. Second, the discussion on simple compliance is complemented with data on numerical compliance, which provide an indication of the magnitude at which a rule has been complied or non-complied with.. As an exploratory exercise, this study covers only the period 2011-2017 ([113]). In line with Reuter's (2015), this analysis provides values of numerical compliance, but with no reference to escape clauses nor flexibility. Data were retrieved from the Ministry of Finance, Independent Fiscal Institutions (IFIs), from self-reported information on compliance from the Fiscal Governance Database (FGD) available for 2017 or the stability and convergence programmes (SCPs). As far as the Romanian expenditure benchmark is concerned, the target, plans and outturns have been calculated following the formula indicated in the law. Overall, data has been gathered on *ex-ante* compliance for 9 Member States, for a total of 42 observations, and on *ex-post* compliance for 13 Member States, for a total of 61 observations. In both cases, most observations are concentrated in the years 2014-2017 ([114]).

Based on the sample used for the present analysis, expenditure rules were complied with in almost 80 percent of cases. Expenditures rules are always complied with between 2011 and 2013 and mostly complied with between 2014 and 2017 (Graph II.4.6). This applies to both *ex-ante* and *ex-post* compliance, although rules appear to be more complied with *ex ante* than *ex post*. In most cases of national rule compliance, the EU expenditure benchmark is also complied with. Graph II.4.7 shows that when compliance could be ascertained for the EU and national expenditure rules, both rules were in most cases complied with at the same time.

Graph II.4.6: **Matching of compliance for EU and national expenditure rules**

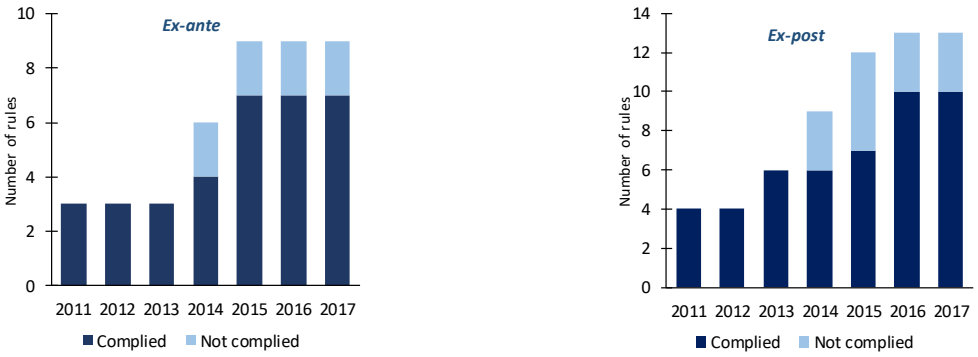


Source: Commission staff calculations from various sources.

([113]) Rules not in force in 2017 are not included, but previous versions of rules currently in force are included (DK, LT and NL).

([114]) In the case of the Netherlands and Slovenia, data on plans coincide with targets, hence *ex-ante* compliance could not be established.

Graph II.4.7: **Simple compliance**



Source: Commission staff calculations from various sources.

4.2. ASSESSING OF STABILISATION PROPERTIES

To test for the effectiveness of national expenditure rules in reducing the procyclical bias, we insert a proxy for expenditure rules in a typical model for the procyclicality of fiscal policy. As discussed, an ample literature sees expenditure rules as a powerful tool in mitigating this pattern and enhancing fiscal policy stabilisation ([115]). In line with Wierts (2008), the model used herein explains the response of surprises on the expenditure side to macroeconomic shocks as captured by total revenues, while controlling for a large number of standard variables suggested by the literature (see below) ([116]). The baseline model specification can be expressed as:

$$FE\Delta\, exp\ ratio_{i,t} = \beta_0 + \beta_1\, FE\ \Delta\, revenue\ ratio_{i,t} + \beta_2\, FE\ \Delta\, revenue\ ratio_{i,t} * ER\ fiscal\ rules\ index_{i,t} + \beta_3\, ER\ fiscal\ rules\ index_{i,t} + \beta_4 X_{i,t-1} + \delta_i + \tau_t + \varepsilon_{i,t} \quad (1)$$

where FE stands for the forecast error, t for the years and i for the country, covering up to 28 EU Member States.

The budgetary aggregates of interest are the planned *change* –or adjustment– in the primary expenditure and the planned *change* in the total revenue in year *t+1* with respect to year *t*, both expressed as a percentage of GDP. Focusing on the *change* in the ratios rather than the ratios themselves helps to neutralise base effects and the influence of statistical revisions (Moulin and Wierts 2006). Expenditure surprises and shocks to revenues –also called forecast errors– are then calculated as the difference of outturns from plans for these budgetary aggregates. Specifically, the dependent variable ($FE\ \Delta\ exp\ ratio$) is the forecast error in the change in primary expenditure ratio for country *i* at year *t*, while the explanatory variables include: the forecast error in the change in total revenue ratio and the interaction term of the revenue forecast errors and the expenditure rule index, measuring the strength of the design of the expenditure rules in force (or a dummy variable taking values of 1 in the presence of expenditure rules and 0 in their absence) ([117]). Forecast errors are measured as the difference between plans and outturns, where negative values indicate overspending (or higher-than-projected revenues). Finally, the model includes country-specific effects (δ_i) and year-specific effects (τ_t).

The selection of control variables follows the academic literature. Following Wierts (2008) and Holm-Hadulla et al. (2012), the following explanatory variables are included:

([115]) Wierts (2008), Holm-Hadulla et al. (2012).

([116]) An alternative specification of the model, as considered in Holm-Hadulla et al. (2012), uses surprises in the output gap instead of revenue surprises. Such specification has been run in this analysis, but due to some inconsistencies in the first vintages of the data, the results were not meaningful.

([117]) The expenditure rules considered here cover all levels of the general government. The fiscal rules index is calculated as the average over the five dimensions defined in the Fiscal Governance Database, multiplied by the sector coverage of the rules and by a penalty for the second and third rule covering the same government sector.

- *Forecast error in real GDP growth rate* (-): to capture the role of automatic stabilisers on the expenditure side of the budget (mainly unemployment expenditure).

- *Initial level of total expenditure* (-): the lagged total expenditure, given that countries with high expenditure ratios may be more under pressure to respect the expenditure plans.

- *Initial level of the headline balance* and *debt to GDP ratio* (-): the lagged headline balance as a ratio to GDP and the lagged stock of government debt as a ratio to GDP, given that the overall fiscal position may influence the extent to which external fiscal surveillance and the financial market force government to comply with their expenditure targets.

- *Initial level of inflation* (-): the lagged GDP deflator, as inflation may affect government expenditure and nominal GDP differently thus giving rise to a 'mechanical correlation' between the denominator of the dependent variable and revenue surprises.

- *Election cycle* (+): a dummy variable which equals 1 in years of parliamentary elections and 0 otherwise, to take into account that upcoming elections may reinforce the incentive to 'buy political support' in the short-run.

- Existence of *other fiscal rules than expenditure rules* in force (-): a dummy variable taking the value of 1 in case of other fiscal rules in force such as budget balance rules and debt rules, and the value of zero otherwise, to control for the possible downward pressure on expenditure stemming from these other fiscal rules.

Real-time fiscal data are used to estimate the model to take better into account the information at the disposal of policymakers when implementing their fiscal plans. All projected data are available from the stability and convergence programmes ([118]), while the outturn data and control variables are obtained from the real-time spring vintages of the Commission's AMECO database; the expenditure rules data derives from the Commission's FGD. Projected data for year *t+1* is obtained from the SCPs submitted in year *t*, while outturn data for year *t+1* is derived from the year *t+2* spring vintages of the Commission's AMECO database ([119]). Based on these data, forecast errors are computed by subtracting the forecast value from the outturn data (i.e. positive values indicate spending overruns relative to the objective or that total revenues as a share of GDP turned out higher than expected). While all EU Member States are required to submit SCPs, lack of data availability regarding some variables reduces the sample to 349 observations during the 1999-2016 period ([120]). This fiscal dataset is complemented with the expenditure and other fiscal rule index/dummies based on the FGD, and a dummy for election years obtained from the World Bank's Database of Political Institutions ([121]).

Descriptive data statistics show that budget execution results in higher-than-planned expenditure and also slightly higher-than-planned revenues. At the planning phase, primary expenditure for the next year is envisaged to decrease by 0.4 pps. of GDP, on average, compared to the previous year (first row of Table II.4.1). However, after budget execution, it tends to be higher by 0.7 pps. of GDP, on average, in year *t* compared to what had been foreseen the year before (in line with European Commissio, 2014). Conversely, Member States are usually prudent when they plan their revenue developments as in year *t* the change in the revenue-to-GDP ratio is on average about 0.2 pps. of GDP higher than planned the year before. At the same time, the data also confirms the so-called 'optimism bias' in growth forecasts, with real GDP growth being on average overestimated by 0.7 pps. In terms of fiscal rules, the dummy variables indicate that expenditure rules have generally been

([118]) The SCP dataset is published on DG ECFIN's homepage and discussed in European Commission (2014).

([119]) For example, the forecast error for year 1999 is the difference between the outturn data as reported in the 2000 Spring AMECO vintage and the planned value as reported in the 1998 SCP.

([120]) As detailed data requirements for the SCPs were formulated only in 2001, format and content of the SCPs varied quite substantially during their first years, which explains the missing data. In addition, the SCPs submission deadline changed in 2009, from the end of the year to April. The transition between these two submission dates implied that no SCP was submitted in 2010.

([121]) The last available outturn data concerns year 2018 (reported in the 2019 SCPs). However, the sample size is limited to 2016, the last year for which the expenditure rule data was available by the cut-off date of the analysis.

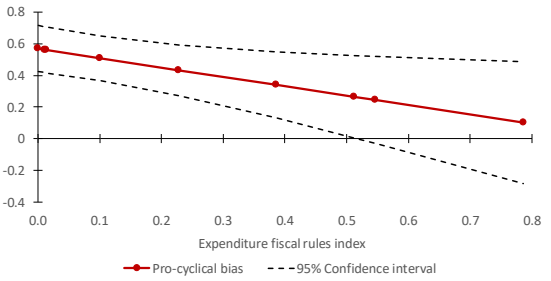
much less common over time than other types of rules, in particular budget balance rules.

Findings from panel regression show that government spending in the EU is indeed procyclical and that expenditure rules reduce the procyclical bias. The positive coefficient on the forecast error in revenues in points to procyclical behaviour in primary expenditure (Table II.4.2, column 1). Specifically, a surprise in total revenues of one pp of GDP translates into a deviation between spending outcomes and plans of 0.45 pps. of GDP during the same period. This finding is in line with some of the literature, in particular Wierts (2008), Deroose et al. (2008) and Turrini (2008), but it departs somehow from studies that find overall fiscal policy to be acyclical or countercyclical in the EU (European Commission 2019a). The regression results also show that most of the control variables have the expected sign, although not all are statistically significant in this specification ([122]). In addition, country-specific features and specific events over the period of the sample are found to be statistically significant and therefore relevant for the estimated relationship of interest. All these estimates are broadly in line with Wierts (2008) and Holm-Hadulla et al. (2012). Finally, the negative coefficient on the interaction term between forecast errors in revenues and the expenditure rule dummy (Table II.4.2, column 2), which is statistically significant, indicates that indeed expenditure rules help to mitigate the procyclicality of fiscal policy. Specifically, the procyclical bias mentioned above decreases by about half when expenditure rules are present ([123]).

Finally, endogeneity tests were run using internal instruments (lagged forecast errors for total revenue and for real GDP growth rate) and pointed to no endogeneity issues in the estimation ([124]).

Stronger expenditure rules (better designed and with large coverage) contribute more to the reduction of the procyclical bias than weaker rules. An alternative specification is used to estimate how the procyclical bias varies as a function of the strength of the expenditure rules, captured by an index which measures the strength of the rule design along five dimensions ([125]). Graph II.4.8 shows how the procyclical bias varies as a function of the expenditure rule index values, which are listed along the X-axis. It suggests that the stronger the expenditure rules (either through better design features or through a wider coverage) the lower the procyclical bias of fiscal policy.

Graph II.4.8: **Decreasing procyclical bias as a function of the design strength of expenditure rules**



Note: The graph shows by how much expenditure increases/decreases to a 1 pps. of GDP unexpected revenue shortfall/windfall, as a function of the strength of the expenditure rule index. The fiscal rules index is calculated as the average across five dimensions defined in the Fiscal Governance Database, summed over all rules in force weighted by the sector coverage and a penalty in case of a second or third rule covering the same sector. It has a theoretical lower bound of 0 in case there are no rules in force and no theoretical upper bound (in this sample the maximum value of the index is 0.8). The procyclical bias coefficient is illustrated for centiles 60, 65, 70, 75, 80, 85, 90, 95, and 100 of the expenditure rule index distribution. The 95% confidence interval is calculated based on Brambor et al. (2006).
Source: SCPs, AMECO spring vintage and Commission Fiscal Governance Database 2016 vintage.

([122]) Only two control variables are consistently statistically significant across most specifications (Table 2, Columns 1-4). The first is the forecast error of real GDP which indicates an immediate strong response in the form of lower (higher) primary expenditure for a positive (negative) surprise in real GDP, which possibly captures a denominator effect (i.e. higher GDP implies a lower expenditure to GDP ratio, all else being equal) and the role of the automatic stabilisers on the expenditure side of the budget (mainly unemployment benefits). The second is a high initial level of debt, which is indeed found to put pressure towards more expenditure control. In the baseline specification (Table II.3.2, Column 1), the initial level of debt is not statistically significant, but the initial level of total expenditure is,

([123]) This estimated impact of the national expenditure rules is robust to the crisis period. Specifically, results remained largely unchanged when controlling for the specific impact of the 2008-2012 recession (and ensuing consolidation) through a dummy variable.

([124]) Endogeneity was tested following Wierts and using the endog command in Stata for the instrumental variable estimation.

([125]) These dimensions are the legal basis, the binding nature of the rule, the nature of the enforcement and monitoring body, the correction mechanism and media visibility. When the interaction term includes a continuous variable (the expenditure rule index) rather than a discrete variable (a dummy variable), the estimated impact conditional on that variable will be a function of the continuous variable (Brambor et al. 2006).

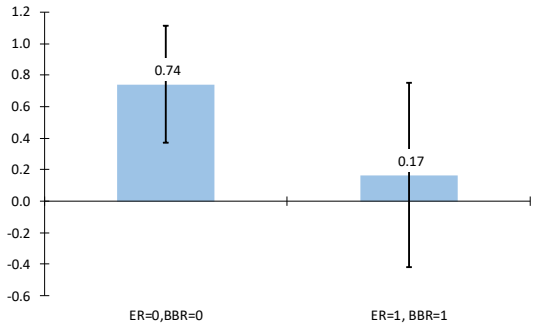
Table II.4.1: **Descriptive statistics**

	Obs.	Mean	Std. dev.	Min	Max
Δ primary exp.-to-GDP ratio (% of GDP, t+1)	349	-0.4	1.3	-8.0	4.2
FE Δ primary exp.-to-GDP ratio (% of GDP)	349	-0.7	2.0	-17.6	6.6
Δ total revenue-to-GDP ratio (% of GDP, t+1)	349	-0.2	1.2	-10.0	3.5
FE Δ total revenue-to-GDP ratio (% of GDP)	349	-0.3	1.4	-9.0	4.4
FE real GDP growth rate (y-o-y)	348	0.7	2.4	-5.1	13.0
Headline balance (% of GDP, t-1)	434	-2.4	3.7	-32.4	6.7
Debt-to-GDP ratio (% GDP, t-1)	428	58.0	32.1	2.9	177.1
GDP inflation (y-o-y, t-1)	461	2.9	4.3	-3.2	48.6
Election year dummy	531	0.3	0.4	0.0	1.0
Dummy expenditure rules	529	0.3	0.5	0.0	1.0
Index of expenditure rules	529	0.1	0.2	0.0	0.8
Dummy budget balance rules	529	0.7	0.5	0.0	1.0
Dummy debt rules	529	0.4	0.5	0.0	1.0

Note: FE refers to the forecast error.
Source: SCPs, AMECO spring vintages, Commission Fiscal Governance Database 2016 vintage, self-collected data on compliance and World Bank (electoral dummy). Unweighted statistics over the time period 1999-2016.

Furthermore, fiscal policy is least procyclical when expenditure rules operate in combination with budget balance rules. Results suggest that the combination of budget balance rules and expenditure rules provides for the least procyclical fiscal policy, namely an acyclical fiscal policy (Graph II.4.9). In the absence of both expenditure and budget balance rules, fiscal policy would have a procyclical coefficient of 0.74 pps. of GDP (Table II.4.2, column 4), which is higher than what was estimated in the baseline. However, the combination of expenditure rule and budget balance rule has a considerable effect as it reduces this procyclical bias to essentially zero when taking the uncertainty around it into account ([126]).

Graph II.4.9: **The procyclical bias for different combinations of rules**



Note: The graph shows the procyclical bias, i.e. by how much expenditure increases/decreases to a 1pp of GDP unexpected revenue shortfall/windfall in different combination of rules, based on estimates presented in Table II.3.2 Column 4 ER stands for expenditure rule while BBR stands for budget balance rule. Four combinations of rules are shown: no expenditure or budget balance rules, only expenditure rules, only budget balance rules and both expenditure and budget balance rules. The bars indicate the 95% confidence interval.
Source: SCPs, AMECO spring vintage and Commission Fiscal Governance Database 2016 vintage.

([126]) The procyclical bias conditional on the presence of different combinations of rules (and its statistical significance) is calculated on the basis of various interaction terms as reported in Table II.4.2, column 4, in line with Brambor et al. (2006).

Table II.4.2: **Panel regressions (EU Member States, 1999-2016)**

Dependent variable	Forecast error change in expenditure ratio			
	Baseline	Baseline augmented with fiscal rule		
	No fiscal rule	ER dummy	ER index	ER and BBR dummy
	(1)	(2)	(3)	(4)
FE Δ revenue ratio	0.45***	0.59***	0.57***	0.74***
	(7.93)	(7.93)	(7.68)	(4.1)
FE real GDP growth rate	-0.30***	-0.29***	-0.29***	-0.29***
	(-5.11)	(-5.24)	(-4.97)	(-5.14)
Total expenditure (stand. levels) (t-1)	-0.15*	-0.12	-0.12	-0.11
	(-1.78)	(-1.18)	(-1.19)	(-0.85)
Debt-to-GDP ratio (t-1)	-0.01	-0.01*	-0.01**	-0.01**
	(-1.52)	(-2.06)	(-2.31)	(-1.91)
FE Δ revenue ratio * ER dummy		-0.34*		-0.03
		(-1.79)		(-0.06)
FE Δ revenue ratio * ER index			-0.58**	
			(-2.32)	
FE Δ revenue ratio * BBR dummy				-0.2
				(-0.96)
FE Δ revenue ratio * ER dummy * BBR dummy				-0.35
				(-0.85)
# observations	366	339	339	339
# countries	28	28	28	28
R-squared	0.4	0.41	0.41	0.42
Wald test time dummies	6.23***	6.32***	8.92***	6.23***

Note: FE indicates to the forecast error, ER refers to expenditure rule, while BBR refers to budget balance rule. Estimates are based on the fixed effects panel estimator with robust standard errors, as in Wierts (2008). *, **, *** denote, respectively, significance at the 10, 5 and 1% level. T-values in parentheses. Other control variables (lagged inflation, headline balance and an election year dummy) are included in all specifications but not reported due to lack of significance. Each variable that is part of the interaction terms was also included as stand-alone variable in each specification but not reported in the table. Three outliers of the expenditure rules index (i.e. the three years during which Bulgaria has had two expenditure rules targeting the general government with exactly the same coverage) were excluded from the estimation sample.
Source: SCPs, AMECO Spring vintages and Commission's Fiscal Governance Database 2016 vintage.

5. CONCLUSIONS

A key innovation of the 2011 reform of the institutional architecture was a greater focus on spending rules. At EU level, the expenditure benchmark was introduced as a second key indicator of the preventive arm of the SGP. In parallel, many Member States introduced national spending rules –often in addition to balanced budget or debt rules– in the wake of the six-pack directive that concerned the national fiscal frameworks. The greater reliance on spending rules reflects the growing consensus in academia and policy spheres that spending rules promote a better balance between budgetary discipline and macroeconomic stabilisation objective, are less procyclical, more transparent and easier to monitor. However, evidence on the performance of spending rules used at EU and Member State level has been very scarce so far.

Against this background, this part assesses the performance of spending rules at EU and Member State level with quantitative analyses. It investigates the ability of fiscal spending rules to (i) ensure sustainable public finances, (ii) offer space for countercyclical stabilisation and (iii) guarantee predictability. The analyses are factual, backward looking and conducted primarily based on quantitative analyses.

Our main findings can be summarised as follows:

Conceptually, the expenditure benchmark seems to better reflect the fiscal effort of governments than the structural balance. While the change in the structural balance is a well-established and widely-known indicator to measure the fiscal effort, it can be distorted by non-policy effects such as revenue windfalls or shortfalls and therefore imperfectly measure the fiscal effort. From a conceptual point of view, the expenditure benchmark seems to better reflect the fiscal effort of the government, since it nets out several factors which are out of control of the governments in the short run and mitigates the frequent revisions of potential growth by using a ten-year average. However, expenditure rules also face challenges, in particular in terms of measurement of discretionary revenue measures and reduced incentives for efficient revenue policies.

In terms of sustainability, counterfactual simulations show that public debt ratios would have been significantly lower today if Member States had applied and complied with the expenditure benchmark since 1999. The counterfactual simulations take into account direct effects from fiscal adjustment on the real GDP level (via a fiscal multiplier) as well as indirect effects on prices (Phillips curve) and interest rates (Taylor rule). The findings reveal that a more front-loaded fiscal adjustment would have reduced public debt significantly, despite the negative effects of temporary lower economic growth and inflation. Debt reduction would have been particularly marked in high-debt Member States. We also find that compliance with the expenditure benchmark compared with the structural balance requirement would have resulted in a slightly more growth-friendly adjustment, if one considers that fiscal adjustment has larger adverse growth effects in good than in bad times. The reason for this is that compliance with the expenditure benchmark would have required a larger fiscal adjustment in good times and a smaller one in bad times.

As regards stabilisation, new evidence shows that the expenditure benchmark would have been more effective in reducing procyclicality than the change in the structural balance. We find evidence of a procyclical fiscal effort since 2000, implying that discretionary fiscal policy is contractionary in bad times and expansionary in good times in the EU on average. The cost of such policy can be high, as discretionary fiscal policy measures counteracts the functioning of automatic stabilisers and increases volatility. The empirical findings show that discretionary fiscal policy tends to be more procyclical in good than in bad times. Importantly, complying with fiscal rules of the preventive arm would have reduced the procyclicality of fiscal policy in the EU. The findings suggest that for Member States it is more (less) demanding in good (bad) times to comply with the required fiscal effort of the expenditure benchmark than with the structural balance methodology. Put differently, the expenditure benchmark appears the more effective indicator to reduce the procyclicality of the fiscal effort than the structural balance.

In terms of predictability, unbiased and realistic macroeconomic and budgetary projections are cornerstones of effective fiscal surveillance. The introduction of the Pact has increased interest in fiscal forecasting in Europe, since budgetary forecasts can play a crucial role in the implementation of the fiscal surveillance framework. It is therefore reassuring that the indicators used to assess the fiscal effort in the preventive arm of the Pact do not appear to be systematically biased. Overall, the size of forecast errors appears broadly similar when the fiscal effort is based on the expenditure benchmark methodology or measured by the structural balance.

New evidence at national level shows that expenditure rules reduce the procyclical bias of fiscal policy. Empirical estimates over the last 20 years demonstrate that the size of the procyclical bias is lower in the presence of expenditure rules. The procyclicality is also reduced by a better design of the expenditure rule (in terms of legal basis, independent monitoring, coverage and consequences of not complying). Furthermore, a combination of expenditure rules and budget balance rules attenuates the procyclical pattern of fiscal policy more than when one of the rules operates alone. Finally, rule compliance enhances the reduction in procyclicality, and for the case of national rules, it even makes fiscal policy acyclical.

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