Debt rule design in theory and practice - the SGP's debt benchmark revisited*

Sebastian Hauptmeier† and Christophe Kamps‡

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Abstract

This paper is linked to two ongoing debates on fiscal policies: first, the implications of low interest-growth differentials for debt sustainability and, second, the reform of the EU fiscal governance framework. In both debates the choice of government debt anchor and the speed of adjustment towards the target value take centre stage. At first sight, the Stability and Growth Pact's debt rule - introduced in 2011 - would seem predestined to fulfil the role of debt anchor. However, our analysis shows that the existing design of the debt rule gives rise to a pro-cyclical bias that has hampered its implementation in the low-growth low-inflation environment experienced since 2014. We propose two parametric changes to the debt rule that would help to better balance the objectives of macroeconomic stabilisation and debt sustainability: first, accounting for persistent deviations of inflation from the central bank's objective; and, second, a reduced speed of adjustment. Putting a reformed debt rule at the centre of the EU fiscal governance framework would allow significantly reducing the latter's complexity - without the need for a revision of the EU Treaties.

Keywords: Interest rates, fiscal policy, public debt, debt sustainability, fiscal rules, fiscal governance

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†Fiscal Policies Division, Directorate General Economics, European Central Bank; sebastian.hauptmeier@ecb.europa.eu

‡Fiscal Policies Division, Directorate General Economics, European Central Bank; christophe.kamps@ecb.europa.eu

1 Introduction

This paper is linked to two ongoing debates on fiscal policies: first, the implications of low interest-rate growth differentials for debt sustainability and, second, the reform of the EU fiscal governance framework. In both debates the choice of government debt anchor and the speed of adjustment towards the target value take centre stage.

From an economic point of view there is widespread agreement that fiscal policies have to ensure debt sustainability, while contributing to macroeconomic stabilisation. However, there is less agreement on the optimal pace of debt adjustment, especially in the current environment characterised by low interest-growth differentials. For example, Blanchard (2019) recently argued that a longer-term outlook of (safe) interest rates below GDP growth rates implies that the issuance of public debt comes without fiscal costs. In the absence of a binding inter-temporal budget constraint welfare costs of issuing public debt may be low, calling for a reassessment of appropriate debt policies and fiscal frameworks (Blanchard et al., 2019). The theoretical literature in general suggests a low pace of debt adjustment is optimal in the absence of sovereign risk (see, e.g., Benigno and Woodford, 2004 and Schmitt-Grohé and Uribe, 2004). However, if public debt is perceived as risky, the presence of multiple equilibria and possible expectation driven increases in interest rates may call for a relatively swift adjustment to prudent levels of debt (see, e.g., Calvo, 1988, Corsetti et al., 2014, Cantore et al., 2017 and Lorenzoni and Werning, 2019). This latter point is particularly relevant for European Monetary Union (EMU), where several countries have experienced significant and volatile spreads vis-à-vis the German Bund since the financial crisis, suggesting that sovereign risk considerations need to be factored in when designing optimal debt policies in EMU.

While there is thus a controversial debate in the theoretical literature on the optimal design of debt feedback rules, there is widespread agreement that debt rather than deficits should be at the centre of fiscal rules/reaction functions. Also, there seems to be an emerging consensus in the policy domain that a revised fiscal framework should be centred on a debt anchor combined with an operational target in the form of an expenditure rule (see, e.g., Juncker et al., 2015, European Commission, 2017a, European Commission, 2017b and Bénassy-Quéré et al., 2018). At first sight, this would suggest that the EU fiscal framework's

debt rule introduced in 2011 should take centre stage in a reform towards simplification of the framework, which is widely seen as necessary (see e.g. Deroose et al., 2018; European Fiscal Board, 2019; Kamps and Leiner-Killinger, 2019). The debt rule was introduced in the fiscal framework precisely to strengthen the focus on debt ratios, by a concrete operationalisation of the European Treaty's 60% of GDP debt criterion. Concretely, the debt rule requires EU Member States with debt ratios above 60% to reduce the excess over the debt criterion by one twentieth per year. However, in practice the debt rule has hardly played a role in the implementation of the EU fiscal framework, partly due to shortfalls in fiscal consolidation but also due to its in-built pro-cyclicality, with requirements increasing significantly in a low-growth and low-inflation environment (see, e.g., European Central Bank, 2016), leading to complaints that strict implementation of the debt rule would be self-defeating (see e.g. European Commission, 2019b, p. 15)

In the main body of this paper we first present a stylised model to highlight the main economic trade-offs related to the adjustment of government debt. While simple, the framework captures the main features of fiscal rules typically also present in more sophisticated general equilibrium frameworks. A fiscal reaction function is derived to economically assess the SGP's debt rule, highlighting the in-built pro-cyclicality of adjustment requirements under the current parametrisation. Backward-looking simulations over the period 1999-2018 provide ample evidence for the pro-cyclicality of the debt rule both in economic good times and bad. In particular, a major shortcoming of the existing debt rule is the failure to account for persistent deviations of inflation from the central bank's price stability objective. We show that the overshooting of inflation in a number of EMU Member States ahead of the financial crisis created a false impression of safety, while the undershooting of inflation after the crisis in several EMU Member States significantly tightened requirements under the existing debt rule. In both situations the existing debt rule was not consistent with an effective backing of fiscal policy for monetary policy in the latter's pursuit of its price stability objective.

We propose a set of parametric changes to the SGP debt rule with a view to better integrating macroeconomic stabilisation considerations and longer-term fiscal sustainability concerns. The former are taken into account through a "nominal" cyclical adjustment which corrects for fluctuations of nominal GDP growth around a country's real GDP growth po-

tential and the ECB's price stability objective.[1] The proposed approach goes beyond the current method by not only removing the impact of the (real) cyclical components of headline budget balances but also adjusting the accumulation of debt for snowball effects related to nominal growth diverging from the real GDP growth potential plus a 2% trend inflation component. This serves two purposes. First, adjusting the accumulation of debt for positive and negative deviations from trend inflation reinforces the counter-cyclical modulation of adjustment requirements. Second, if implemented and adhered to, our approach would help to better align fiscal policies in euro area Member States with the ECB's monetary policy objective to achieve price stability. This would promote a better macroeconomic policy-mix.

Simulation analysis for euro area countries suggests that the proposed "nominal" cyclical adjustment would significantly smoothen adjustment requirements compared to the status quo without impairing the debt sustainability objective. Our simulations also suggest that for countries with very high debt the "1/20" adjustment speed of the current framework becomes particulary demanding when growth is persistently low. Therefore, in order to avoid that fiscal adjustment becomes self-defeating, the speed of adjustment under the debt rule could be reduced from currently 5% of the distance to the debt reference value to, for example, 3%. In order to assess the sensitivity of our simulations to the underlying macroeconomic assumptions we show two "low for long" scenarios which assume that inflation and interest rates, respectively, remain at the presently low levels for an extended period of time. Given that our "nominal" cyclical adjustment approach filters out the cumulative impact of inflation differentials vis-à-vis 2%, the resulting adjustment requirements are insulated from inflation shocks.

Our paper offers the following lessons for the debate on reforming the EU fiscal framework. First, our proposal for a reform of the SGP's debt rule offers a way to address its economic weaknesses and to put it at the centre of a revised EU fiscal framework. All other elements of the framework should be made consistent with the newly designed debt rule. For example, the so-called medium term objectives should be adjusted to be consistent with achieving the debt target at the recommended speed of adjustment, and the same applies for an expen-

[1]The rate of 2% we choose to calibrate the trend inflation component refers to the change in the GDP deflator and not to the HICP, which is the price index underlying the ECB's definition of price stability. We choose 2% for simplicity of exposition, bearing in mind that the ECB's aim is for HICP inflation close to, but below, 2% over the medium term.

diture rule should this be made the operational target. Our paper is agnostic on whether a structural balance rule or a expenditure rules should be made the single operational target under a revised framework; both would work in principle if aligned with the requirements of our debt rule proposal, which would provide the anchor.[2]

Second, focussing the fiscal framework on the achievement of a debt target would create fiscal space compared to the current framework.[3] This space could be used to finance public investment in priority areas such as climate change, digitalisation, infrastructure and research and development. While there have been calls for a specific treatment of public investment under the existing SGP framework (see, e.g., European Fiscal Board, 2019 and Blanchard et al., 2019), this would risk in a further complication rather than simplification of the framework. A symmetric treatment of the 60% of GDP reference level, by implying convergence towards the fiscal anchor also from below, may be an alternative way to create budgetary room for additional investment, and this without the need for special exemptions. Such symmetric treatment could also be useful in a situation where monetary policy reaches the effective lower bound and debt dynamics move towards an undershooting of the debt target. Fiscal policy would thus support monetary policy, allowing the latter to achieve its goal faster and with fewer side effects (Lagarde, 2019).

Third, our proposal does not require revisions of EU primary law. Article 126 of the Treaty on the Functioning of the European Union, which focusses on the identification of "gross policy errors", would not need to be amended, and the 60% of GDP debt reference value would be preserved. Instead, secondary legislation would need to be adjusted to give more prominence to the debt rule and to amend its parametrisation. In addition, the medium-term objectives - if retained - should be modified such as to ensure consistency with the desired speed of adjustment to the debt target, and the same would apply for the expenditure benchmark - again, if retained.

[2]Several contributions favour an expenditure-based indicator over the current structural balance approach of the SGP, given arguably better cyclical properties of the former (see, e.g.,Andrle et al., 2015, Bénassy-Quéré et al., 2018 and Holm-Hadulla et al., 2012).

[3]Kamps and Leiner-Killinger, 2019 show that the current medium-term objectives for euro area Member States - structural deficits of no more than 0.5% of GDP for countries with debt above 60% of GDP - are inconsistent with debt ratios converging to 60% of GDP. For the average euro area Member State, with nominal growth expected to be around 3% over the long term, convergence of the debt ratio to 60% of GDP would be consistent with a steady-state deficit ratio of 1.75% of GDP.

The remainder of the paper is organised as follows. Section 2 first discusses the economic literature on the optimal pace of debt adjustment and presents a stylised model that highlights the main economic trade-offs. These are then linked to the basic setup of the SGP's debt rule. A description of the current framework is then provided in Section 3 before turning to our proposal for a "nominal" cyclical adjustment approach and comparing it to the status quo. Section 4 explains the simulation approach and presents backward- and forward-looking debt simulations for selected euro area countries, highlighting the impact of a number of changes both to the parametric settings of the debt rule as well as the underlying macroeconomic assumptions. Conclusions are drawn in Section 5.

2 The economics of debt adjustment

The theoretical literature typically finds that in the absence of sovereign risk government debt optimally follows a near random walk process (see, e.g., Benigno and Woodford, 2004 and Schmitt-Grohé and Uribe, 2004). In the presence of nominal rigidities spending and taxes are not adjusted in response to shocks in order to avoid short-term volatility in taxes and prices. On the other hand, a growing body of research examines optimal policy responses in the presence of sovereign risk. Calvo (1988) developed the notion of multiple equilibria and expectation driven sovereign risk. Adam (2011) shows that budget risk considerations can provide quantitatively important incentives to gradually reduce government debt over time. Cantore et al. (2017) use a DSGE framework with a rich fiscal sector to study optimal fiscal and monetary policy when government bonds are subject to default risk. The analysis finds that when debt and risk premia are high it is optimal to reduce debt swiftly. Recently, Lorenzoni and Werning (2019) analyse the conditions under which slow moving debt crises, i.e. self-fulfilling equilibria with high interest, can be ruled out. Such conditions include the maintenance of low debt levels and sufficiently aggressive fiscal responses when debt is high.

Below we present a stylised model which aims to capture the main economic trade-offs related to the adjustment of government debt (see also Kanda (2011) and Carnot (2014)). The starting point is the standard debt accumulation equation

$$d_t = \frac{1+i_t}{1+y_t} d_{t-1} - pb_t, \tag{1}$$

where d_{t-1}, y and pb_t label the initial debt-to-GDP ratio, the "nominal" growth potential of the economy, reflecting trend dynamics in growth and prices, and the primary balance-to-GDP ratiom respectively. Abstracting from stock flow adjustments, debt at time t depends on the size of two terms: First, the lagged debt ratio multiplied with the the growth-adjusted interest rate $\frac{1+i_t}{1+y_t}$, where

$$i_t = i_t^b + \gamma(d_{t-1} - d^*). \tag{2}$$

The (implicit) interest rate captures a benchmark rate i_t^b plus a spread that depends on the deviation of debt in the previous year from the debt target d^*. The debt target could for instance reflect a level of debt that ensures a sufficient safety margin with respect to the fiscal limit (Bi, 2012). In our stylised framework, we let the interest rate spread increase linearly with the distance to the debt target. While typically the literature assumes non-linearity (e.g. Cantore et al., 2017), our simple approach is sufficient to introduce the notion of sovereign risk and therefore to create an economic incentive to reduce government debt. γ quantifies the interest sensitivity to the debt overhang. Second, the primary balance ratio can be decomposed into a structural and cyclical component:

$$pb_t = capb_t + \mu\, og_t, \tag{3}$$

where $capb_t$ labels the cyclically-adjusted primary budget balance ratio, μ the cyclical sensitivity of the budget balance and og_t the output gap. The output gap evolves according to the dynamic equation

$$og_t = \phi\, og_{t-1} - \xi\, \Delta capb_t, \tag{4}$$

where ϕ denotes the speed of output gap closure. ξ and $\Delta capb_t$ label the fiscal multiplier and the fiscal stance (discretionary fiscal policy action), respectively.

2.1 The optimal fiscal stance

The fiscal policy maker is assumed to minimise the following quadratic loss function when setting the fiscal stance

$$\mathcal{L} = \upsilon(og_t)^2 + (1-\upsilon)(d_t - d^*)^2. \tag{5}$$

This setup captures the trade-off between, on the one hand, cyclical considerations reflected by the weight υ and, on the other hand, debt sustainability considerations which receive a weight $(1-\upsilon)$, assuming $0 < \upsilon < 1$. Differentiation with respect to the fiscal stance ($\Delta capb_t$) and plugging in (2), (3) and (4) gives the following fiscal reaction function[4]

$$\Delta capb_t^* = \theta og_{t-1} + \delta \left[\frac{i_t^b - y}{1+y} d_{t-1} + \left(1 + \frac{\gamma}{1+y}\right)(d_{t-1} - d^*) - capb_{t-1} \right], \tag{6}$$

where

$$\theta = \frac{\upsilon\xi - (1-\upsilon)(1-\xi\mu)\mu}{\upsilon\xi^2 + (1-\upsilon)(1-\xi\mu)}\,\phi \tag{7}$$

$$\delta = \frac{(1-\upsilon)(1-\xi\mu)}{\upsilon\xi^2 + (1-\upsilon)(1-\xi\mu)} \tag{8}$$

The implications of the initial cyclical conditions in the fiscal reaction function (6) are not clear-cut. This relates to the fact that the loss function on the one hand penalises negative and positive output gaps while increasing output gaps are generally desirable from a fiscal sustainability point of view given that larger cyclical components improve the budget balance. The relative importance of these two channels depends on the relative weighting of the loss function objectives but also on the sensitivity of the budget to cyclical conditions μ and the size of the fiscal mulitplier ξ. As an example, let's assume that the government assigns equal weight to both the stabilisation and sustainability objective, i.e. $\upsilon = (1-\upsilon)$. Moreover, setting $\mu = 0.5$ in line with the European Commission's 2018 estimate for the average budgetary sensitivity in euro area countries implies that $\theta > 0$ for $\xi < 2$. Under these relatively plausible assumptions the optimal fiscal stance would be contractionary (expansionary) in the presence of a positive (negative) initial output gap.

Turing to the second term on the right-hand side of equation (6), we assume that $(1-\xi\mu) > 0$, therefore ruling out self-defeating fiscal consolidation.[5] This implies that $\delta > 0$. Along the lines of Blanchard (2019), the differential between the benchmark interest rate and the growth rate of the economy will therefore determine whether the optimal fiscal stance is

[4]For expositional convenience, we follow Fournier (2019) in defining all ratios in the model with respect to (nominal) potential GDP. The growth potential of the economy y is accordingly assumed to be time-constant. However, also from an economic point of view it is useful to evaluate debt dynamics relative to potential rather than actual GDP developments.

[5]For a standard value of the budget sensitivity ($\mu = 0.5$), fiscal consolidation becomes self-defeating - in the sense that fiscal consolidation does not improve the budget balance - at multipliers above 2.

positively or negatively related to the initial debt ratio (first term in square brackets on the rhs of equation (6)). If the (sovereign risk-adjusted) interest-growth differential is positive (negative) a higher level of debt in $t-1$ will imply a contractionary (expansionary) fiscal stance in t. Moreover, the optimal fiscal stance will be more contractionary the larger the interest-sensitivity to the debt overhang (second term in square brackets on the rhs of equation (6)) and the larger the distance to the debt target ($d_{t-1} - d^*$). Finally, the need for fiscal adjustment declines with the initial cyclically-adjusted primary balance ($capb_{t-1}$).

2.2 Debt rule design and pro-cyclicality

In view of the analysis of the functioning of the European debt rule in the remainder of this paper it is useful to formulate the following debt motion equation which captures the different components of debt adjustment.

$$\alpha(d_{t-1} - d^*) = \Delta capb_t + capb_{t-1} + \mu\, og_t - \frac{i_t - y_t}{1 + y_t} d_{t-1}. \tag{9}$$

At this stage we introduce a stylised debt rule which captures the main features of the European framework which is described in detail in Section 3. The α parameter labels the speed of adjustment which is applied to the distance from the debt target d^*. The debt adjustment is composed of four components: the fiscal policy stance (first term on the rhs of equation (9)), the cyclically-adjusted primary balance in $t-1$, the budgetary impact of the cycle (operation of automatic stabilisers; second term) and the snowball effect (third term). Note that the debt adjustment is not only directly affected by the cycle via the cyclical component of the budget balance but also indirectly given that higher nominal GDP growth y_t reduces the snowball effect in the debt accumulation equation.

Given the fixed adjustment requirement, equation (9) implies that the fiscal policy stance will move pro-cyclically in the presence of shocks to any of the macroeconomic parameters that affect the accumulation of debt. These need to be fully absorbed by the fiscal policy stance $\Delta capb_t$. So in case the output gap declines, any related budgetary shortfalls, e.g. due to lower cyclical taxes, would need to be compensated for by a more restrictive fiscal stance. The same holds true for the case of lower inflation and nominal GDP growth.

Relaxing the debt adjustment rule through a cyclical modulation of $\Delta capb_t$ in line with

equation (6) would reduce this pro-cyclicality via two in-built features. First, the direct conditioning on the lagged output gap (the first term). Second, the responsiveness of the rule to both the lagged debt ratio and the debt overhang depends on the nominal trend GDP growth rate of the economy not actual growth. Therefore, cyclical variation in nominal GDP growth is not captured in the reaction function. Favourable snow-ball effects in economic good times (related to relatively strong growth and inflation dynamics) do not imply a deceleration in the fiscal adjustment. Symmetrically, when growth and price developments weaken during recessions, causing unfavourable debt dynamics, the optimal fiscal stance according to equation (6) would not tighten pro-cyclically. An issue that arises in this context is which trend component to chose for price developments in order to determine the nominal trend growth rate y. One option would be to link the nominal component to the inflation objective of the central bank. This would imply that the fiscal policy stance becomes less (more) contractionary in times of inflation below (above) the price stability objective, implying symmetric fiscal support for the monetary policy authority to achieve the inflation objective.

2.3 Debt rule design and fiscal targets

Abstracting from cyclical considerations, i.e. assuming $og_t = 0$, equation (9) can be re-arranged to highlight the implications of different parameter settings for primary balance targets

$$pb_t^* = \frac{i_t - y_t}{1 + y_t} d_{t-1} + \alpha(d_{t-1} - d^*). \tag{10}$$

The primary balance ratio required to comply with the the stylised debt rule depends in particular on the adjustment speed α, the interest growth differential $(i_t - y_t)$ and the initial level of debt (d_{t-1}). Table 2 gives on overview of primary balance targets for different parameter constellations and a debt target $d^* = 60$ in line with the SGP. Three debt regimes are distinguished: low debt at 60% of GDP (which implies that the debt rule is not binding), high debt at 100% of GDP and very high debt at 140% of GDP. In addition, primary balance targets are computed for different levels of the interest-growth differential, i.e. negative at -1%, zero (which implies that the first term in equation 10 disappears) and positive at 1%. Finally, the speed of adjustment is varied between 5% (SGP 1/20 rule) and a somewhat

slower pace of 3%. Column (1) in Table 2 shows that for countries that have reached the debt

Table 1: Primary balance targets

α	$i-y$	d_{t-1}		
		60	100	140
		(1)	(2)	(3)
0.05	0.01	0.6	3.0	5.4
	0.00	0.0	2.0	4.0
	-0.01	-0.6	1.0	2.6
0.03	0.01	0.6	2.2	3.8
	0.00	0.0	1.2	2.4
	-0.01	-0.6	0.2	1.0

Note: The calculations assume $y = 0.03$.

target, the interest-growth differential determines the debt-stabilising primary balance ratio. In line with the arguments put forward by Blanchard (2019) a country can run persistent primary deficits if $i - y < 0$. Note that treating the 60% of GDP reference level for the debt ratio as a symmetric target would imply convergence towards the fiscal anchor from above and below. For the macroeconomic policy mix, such a symmetric treatment could be useful in a situation where monetary policy reaches the effective lower bound and debt dynamics move towards an undershooting of the debt target. In this context, Leeper (2016) emphasises the risk of asymmetric fiscal responses to monetary policy, i.e. fiscal tightening when interest rates rise, but no fiscal loosening when interest rates fall. In the latter case, fiscal policy fails to accommodate the monetary easing to raise inflation.

On the other hand from column (3) it becomes apparent that the combination of very high debt, positive interest-growth differentials and high speed of adjustment imply quite demanding targets for the primary balance ratio which would be difficult to sustain for extended periods when factoring in fiscal fatigue (see, e.g., Ghosh et al., 2013). Here, moving to a somewhat lower pace of debt adjustment ($\alpha = 0.03$) could support political feasibility.

While in the theoretical literature on fiscal policies much of the analysis is cast in terms of the implications for the primary balance, in the policy discussion the focus often is on implications for the overall balance. The EU fiscal framework, for example, highlights two deficit levels: first, the 3% of GDP headline deficit reference value (often misunderstood to be a target in itself), the breach of which may trigger a so-called Excessive Deficit Procedure;

and, second, the medium-term objective for the structural balance (which is meant to be the overarching target in the framework), which is to bet set at a deficit no larger than 0.5% of GDP for Member States with debt above 60% of GDP and no larger than 1% of GDP for Member States with debt below 60% of GDP.

The above analysis can be easily recast in terms of the overall deficit, i.e. including interest payments. The target deficit ratio, def_t^*, consistent with debt reduction at the desired pace can be written as

$$def_t^* = \frac{y_t}{1+y_t} d_{t-1} - \alpha(d_{t-1} - d^*). \tag{11}$$

Table 2 shows the implied deficit targets for alternative values of the economy's nominal growth rate and the initial debt ratio. As expected deficit targets are the less stringent the higher the nominal growth rate. However, the table also reveals that deficit targets get more stringent the higher the initial debt ratio only if the pace of debt reduction is larger than the steady-state nominal growth rate. It is easy to see that the deficit target is invariant to the debt ratio for $\alpha = \frac{y}{1+y}$.

For the average euro area Member State - which has grown nominally at a rate around 3% over the EMU period - a deficit target of around 1.75% of GDP would be consistent with convergence to the reference value for a speed of adjustment of 3%. This would create space of slightly more than 1% of GDP for the average euro area Member State.[6] Also, compared to the current parametrisation of the debt rule, the required tightening in the deficit target would be less drastic as either nominal growth falls short of this value or the initial debt ratio increases.

[6]Such number is significant when assessed against recent calls to create room for public investment. Blanchard et al. (2019), for example, argue for "golden rule accounting", allowing for debt financing of net public investment. In turn, net public investment of 1 to 1.5% of GDP would be sufficient to restore public capital stocks to pre-crisis levels (Kamps, 2006; Checherita-Westphal et al., 2014).

Table 2: Overall budget balance targets

α	y	d_{t-1}		
		60	100	140
		(1)	(2)	(3)
0.05	0.035	2.0	1.4	0.7
	0.030	1.7	0.9	0.1
	0.025	1.5	0.4	-0.6
0.03	0.035	2.0	2.2	2.3
	0.030	1.7	1.7	1.7
	0.025	1.5	1.2	1.0

3 Debt rule design in practice

3.1 The design of the European debt rule

The Treaty on the Functioning of the European Union (TFEU) in Art. 126 specifies that compliance with the debt criterion requires a country's debt ratio to be either below 60% of GDP or "sufficiently diminishing and approaching the reference value at a satisfactory pace." In the context of the "Six Pack Reform" the debt criterion was operationalised in 2011. According to the so called "debt benchmark", a country's government debt ratio is considered sufficiently diminishing "if the differential with respect to the reference value has decreased over the previous three years at an average rate of one twentieth per year"[7]. The formula for the so called "backward-looking" debt reduction benchmark reads as follows:

$$bb_t = 60 + \frac{0.95}{3}(d_{t-1} - 60) + \frac{0.95^2}{3}(d_{t-2} - 60) + \frac{0.95^3}{3}(d_{t-3} - 60) \tag{12}$$

where bb_t denotes the SGP's backward-looking debt reduction benchmark in year t. Art. 2(1a) Reg. 1467/97 mentions two additional configurations for the debt reduction benchmark, i.e. a forward-looking one which covers a two-year ahead period based on a "no-policy-change" assumption and the cyclically-adjusted debt reduction benchmark.[8] The latter will be discussed in more detail in the next section.

The gap between the actual debt ratio in a given year and the debt reduction benchmark

[7] See Art. 2(1a) of Council Regulation 1467/97.

[8] Note that a three year transitional period was applied for Member States subject to an excessive deficit procedure started before 8 November 2011. See Section 2.2.1.3. in European Commission (2019c) for details. In this paper we abstract from transitional considerations.

then quantifies the necessary adjustment to comply with the debt rule, i.e.

$$bb_t^{gap} = d_t - bb_t \tag{13}$$

If an EU Member State breaches the debt reduction benchmark in a given year, i.e. if the debt ratio exceeds the benchmark value, Art. 126(3) TFEU requires the European Commission to issue a report in which it assesses whether the respective country is in compliance with the Treaty's debt criterion. In the report the European Commission - according to Art. 2(3) Reg. 1467/97 - shall take into account all relevant factors which may significantly affect the assessment of compliance with the deficit and debt criteria, including developments in the medium-term economic and budgetary position.

To date the SGP's debt rule has been a binding constraint mainly for countries with very high debt ratios, notably for Belgium and Italy for which the European Commission issued Art. 126(3) reports on a regular basis since 2015. While gaps in relation to the fulfilment of the debt rule have been significant in these two countries, a number of mitigating relevant factors were put forward as justification for not opening a debt-based excessive deficit procedure. Several reports argued that unfavourable economic conditions related, in particular, to low inflation and negative real growth would lead to an unwarranted fiscal tightening. This line of argument underlines the analysis shown in Section 2. Pro-cyclicality of the SGP's debt rule has been put forward frequently as an obstacle to its effective implementation (see, e.g., European Central Bank, 2016).

3.2 Reducing procyclicality via a "nominal" cyclical adjustment of the debt rule

The cyclical adjustment of fiscal balances is a standard method to assess the impact of the economic environment on fiscal developments. Underlying budget balances are computed by applying estimated tax and spending elasticities to the output gap and removing the resulting cyclical component (see, e.g., Mourre and Princen, 2014, and Price et al., 2014). Such cyclical adjustment is "real" in the sense that the correction takes into account deviations of real GDP from its potential. However, as discussed earlier the accumulation of government debt is not only affected by the cyclical components of the budget balance but also by developments in nominal GDP via the "denominator effect" .

As mentioned in Section 3.1, the current version of the debt rule in the Stability and Growth Pact framework includes a cyclically-adjusted configuration (see Section 2.2.1.2 in European Commission (2019c) for details) which reads as follows

$$\left(\frac{D_t}{Y_t}\right)^{3-year-adjusted} = \frac{D_t + \sum_{j=0}^{2}(C_{t-j})}{Y_{t-3}\prod_{h=0}^{2}(1+y_{t-h}^{pot})(1+y_{t-h}^{def})} \tag{14}$$

D_t and Y_t stand for the nominal level of debt and GDP, respectively. The growth rates of real potential GDP and the GDP deflator are denoted by y_{t-h}^{pot} and y_{t-h}^{def}. C_t labels the cyclical component of the budget balance. Equation (14) shows that the cyclically-adjusted debt reduction benchmark of the SGP implies two adjustments to the debt ratio: First, the contemporaneous level of debt is corrected for the sum of the cyclical deficit components of the current and the previous two years. Second, nominal GDP in the denominator is corrected for deviations of real from potential GDP growth. This cyclical adjustment however does not take into account two factors, notably the multi-year snowball effects related to cyclical changes in primary balances (empirically rather small) and the impact of cyclical changes in inflation (empirically important). We will show in the following that the latter in particular has sizable quantitative implications for the accumulation of debt.

Note therefore that an alternative cyclical adjustment of the debt ratio could be done on the basis of the following adaptation of the standard debt accumulation equation:

$$d_t^{nca} = \frac{1+i_t}{(1+y_t^{pot})(1+y^{def2\%})}d_{t-1}^{nca} - capb_t \tag{15}$$

where d_t^{nca} denotes the nominal cyclically adjusted debt ratio.[9] Note that the correction of the snowball term (relative to Equation (1)) works via two adjustments of the decomposed nominal GDP growth rate. First, the real GDP growth rate is replaced by y_t^{pot}, i.e. the growth rate of potential GDP. Second, the growth rate of the GDP deflator is replaced by the (below, but close to) 2% price stability definition of the European Central Bank. The nominal potential growth rate of the economy is then given by $y_t^{npot} = (1+y_t^{pot})(1+y^{def2\%})$. The correction for deviations from this nominal growth potential implies that the debt ratio is cyclically adjusted in "nominal" terms, i.e. that deviations of inflation from 2%

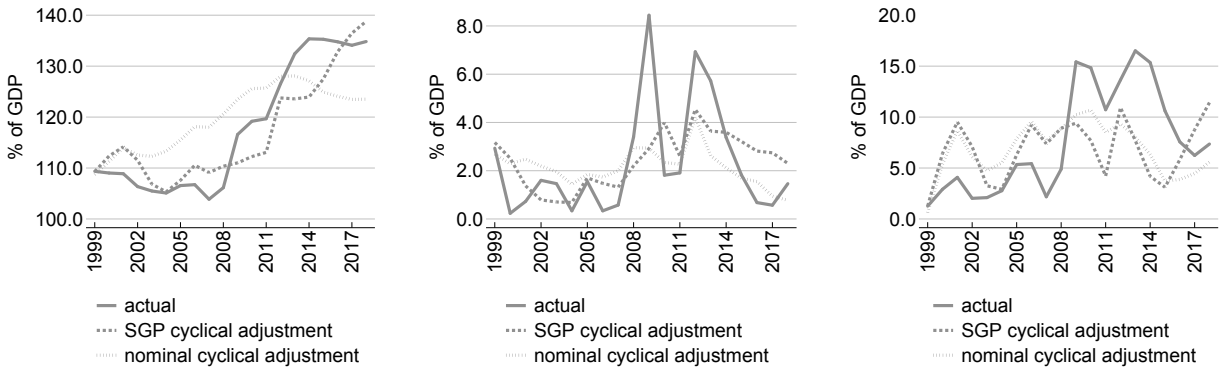
[9]Note that the computation of the cyclically-adjusted debt ratio according to Equation (15) requires the setting of a base year in which the unadjusted debt ratio d_{t-1} serves as the reference point. Concretely, when implementing the nominal cyclical adjustment of the debt ratio for the period 1999-2018 as shown for example in Figure 1a the (unadjusted) debt ratio in 1998 serves as the starting point.

are treated as a cyclical fluctuation. Jarociński and Lenza (2018) for example argue that a reliable measure of the output gap should also capture deviations of inflation from its trend. This warrants an explanation.

While obviously price developments show strong cyclical patterns it is less straightforward to set a benchmark or potential rate for inflation than for GDP growth. Of course, the price stability objective of the ECB is a natural reference point for euro area countries. Treating it as the benchmark rate in the context of our cyclical-adjustment of debt serves two purposes. First, adjusting the accumulation of debt for positive and negative deviations from the inflation objective implies that adjustment requirements under the debt rule would vary in a counter-cyclical way with economic conditions. This is the core aspect of our approach that would help to bring the debt rule more in line with the features of the theoretical fiscal reaction function derived in Section 2. Second, if implemented and adhered to, such a rule would gear fiscal policies in euro area Member States towards the ECB's price stability objective which would support its achievement. Blanchard et al. (2019) argue in favour of a change of the European fiscal framework in order to ensure that Member States conduct their fiscal policies "in a way that supports the ECB in attaining its stability objective".

Figure 1 highlights the impact of our nominal cyclical adjustment approach on debt accumulation for the example of Italy over the 1999-2018 period. It compares nominally adjusted debt developments with the ones implied by the real adjustment method under the current debt rule. Italy is taken as an example here because, fist, it is one of the countries that entered EMU with a debt level above 100% of GDP and, second, inflation showed significant positive deviations from 2% in the early 2000s which helps to highlight the quantitative impact of our approach, also in comparison to the current SGP method. Figure 1b shows that the pro-cyclical pattern of the snowball effect on the accumulation of debt is somewhat reduced by the SGP method, which accounts for deviations of real GDP growth from that of potential GDP. This can be seen in particular during the two recent recessions in Italy in 2008/09 and 2012/13 when large snowball effects implied rapid increases in the debt ratio while the real cyclical adjustment smoothes these cyclical peaks. Note, however, that the nominal cyclical adjustment implies significant additional smoothing especially during two periods, i.e. between 2001-04 when inflation developments exceeded 2% and as of 2010 when growth rates in the GDP deflator persistently remained below the price stability definition.

Figure 1: Cyclically adjusted debt - SGP method vs proposed nominal cyclical adjustment (Italy, 1999-2018)



(a) government debt **(b)** snowball effect **(c)** gap to debt rule

Source: AMECO and own computations

Figure 1b highlights this additional smoothing that further reduces the procyclical pattern of the snowball effect which is larger in the high inflation period before the crises and lower thereafter.

This has significant quantitative implications for the requirements under the debt rule. Figure 1c shows the gaps vis-à-vis the debt reduction benchmark computed in line with Equation (13) over 1999-2018. Actual gaps are compared to the ones based on the two different cyclical adjustment methods. Note that for the case of Italy the nominal cyclical adjustment implies a significant smoothing of the gaps vis-à-vis both values based on actual numbers and the ones based on the SGP's real cyclical adjustment method. This results from the fact that the former not only treats fluctuation of real GDP growth around potential GDP growth as cyclical factors but also deviations of inflation from the price stability definition, which therefore also do not impact on the nominally adjusted debt reduction benchmark in a given year. As stated above, this implies a significant additional smoothing of the adjustment requirements over the cycle. Concretely, adjustment requirements will be lower not only when growth is below potential but also in times when inflation is below the price stability definition and vice versa. The in-built pro-cyclicality of the current debt rule is thereby reduced.

4 Simulations

In order to quantitatively assess the implications of the nominal cyclical adjustment method for the debt rule described in Section 3.2, this section presents simulation analysis for selected euro area countries and the euro area aggregate. Section 4.2 will start with backward-looking simulations for the period 1999-2018. A particular focus, particularly in the backward-looking part, will lie on those countries for which the debt rule has been a binding constraint in recent years, notably Italy and Belgium. The forward-looking simulations shown in Section 4.3 then cover the period 2020-2029. The set of countries will be broadened to France, Italy and Spain which currently show sizeable gaps to the SGP debt rule. Germany is added as a country case where current projections point to sizeable space under the debt rule in the coming years, implying that a symmetric treatment of the debt reference level would imply fiscal loosening.

4.1 Assumptions

As regards data sources, the simulations are done using the latest vintage of the European Commission's Macro-economic database AMECO (Autumn 2019 Economic Forecast). Latest European Commission projections are used for the years 2019-21. As of 2022, fiscal and macroeconomic assumptions are in line with the European Commission's 2018 Fiscal Sustainability Report (FSR) (see European Commission, 2019a). The latest T+10 assumptions for potential GDP growth rates are taken from the Output Gaps Working Group of the Economic Policy Committee. In line with the European Commission's baseline assumptions, underlying for example the debt sustainability analysis presented most recently in the 2018 FSR, we assume that output gaps gradually close within three years after the end of the projection horizon of the European Commission forecast, i.e. from 2022 to 2024.[10] At the same time, the growth rate of the GDP deflator gradually converges towards 2%.

The fiscal adjustment scenarios require additional assumptions. Here we assume an aggregate fiscal multiplier of 0.7. Concretely, a 1 percentage point of GDP fiscal contraction - as

[10]We do not cover Greece in our paper given its specific debt structure and arrangements following the economic adjustment programme.

measured by the change in the underlying fiscal balance - will reduce the real GDP growth rate by 0.5 percentage point and the growth rate of the GDP deflator by 0.2 percentage point in the same year. This seems to be a reasonable assumption in light of the available empirical evidence. In their meta analysis Gechert and Rannenberg (2018) for example show a mean value of 0.35 for the real fiscal multiplier related to unspecified public deficit shocks.[11] Moreover, all adjustment scenarios are based on the assumption of fixed implicit interest rates. Cyclical semi-elasticities which are needed to recompute the cyclical components in the adjustment scenarios are in line with the European Commissions's standard assumptions[12] and kept constant beyond the projection horizon of the Commission forecast.

4.2 Backward-looking simulations

4.2.1 Actual versus cyclically adjusted debt rule scenarios

While the SGP's debt rule in its current operationalisation has only been in place since 2011 it is still informative to see how selected euro area countries and the euro area as a whole would have performed against this benchmark from the start of EMU in 1999 onwards. Figure 2 shows actual fiscal and macroeconomic developments for Italy for the years 1999-2018. It contrasts these actual developments with simulations based on the proposed "nominal" cyclical adjustment method described in Section 3.2.

Figures 2a and 2b depict the benchmark values for growth and inflation that are used for the cyclical adjustment, i.e. potential GDP growth and the 2% inflation norm, against actual developments. While in Italy real GDP growth fluctuated around the growth potential in the years before the 2008/09 recession, the GDP deflator growth rate significantly exceeded 2% in most years. Note that - as shown in Figure 2c - this implies that the cyclically adjusted debt ratio exceeds the actual debt ratio over the pre-crisis period and only drops below the actual ratio around the time of the 2012/13 economic downturn ("nominal" cyclical adjusted ratios are labelled "nca").

The decline in the government debt ratio from around 110% at the start of EMU to around

[11] In the Appendix we provide additional simulations which show the sensitivity of the debt projections with respect to alternative assumptions for the fiscal multiplier (see Figure A.1).

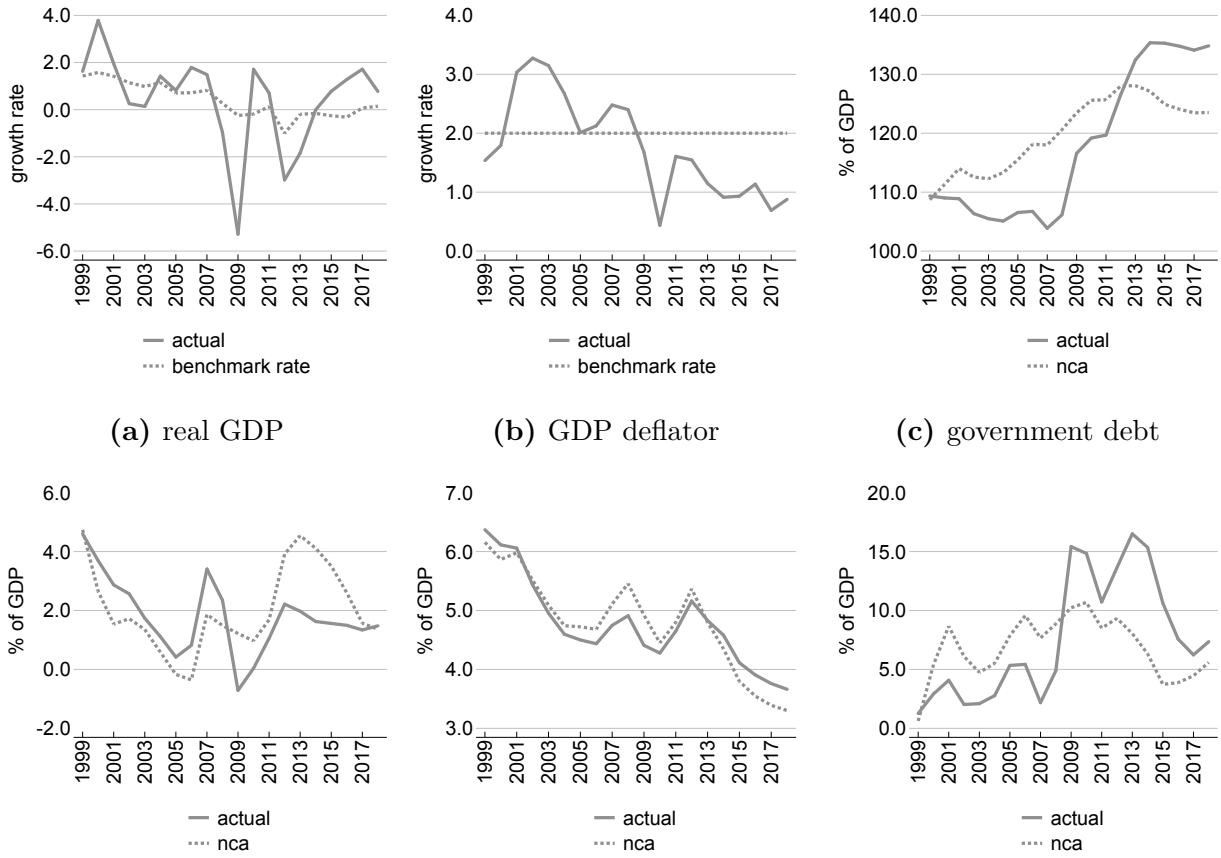
[12] See Box 1.3 in European Commission, 2019c.

100% in 2007 was mainly driven by favourable macroeconomic developments, notably relatively high inflation, while in nominally-adjusted terms debt increased. This is in line with the notion that economic good times before the crisis were not used to build buffers. As can be seen in Figures 2d and 2e declines in interest spending following EMU accession where more than offset by lower primary surpluses. Figure 2f finally depicts gaps vis-à-vis the debt reduction benchmark (1/20 rule), both actual and in nominal cyclically adjusted terms. These reflect the differences in actual and nominal cyclically adjusted debt developments, i.e. larger gaps before the 2008/09 recession owing to structural debt increases and lower gaps in the aftermath of the crisis when weak economic developments accelerated the accumulation of debt via a stronger snowball effect. As highlighted in Section 3.2 the cyclical adjustment smoothes the requirements under the debt rule over the cycle, thereby reducing the in-built pro-cyclicality.

The case of Belgium looks somewhat different as can be seen from Figure 3. While starting in 1999 with a similar ratio of government debt-to-GDP as Italy, fluctuations around the benchmark rates for growth and inflation seem to broadly balance out over the period ahead of the 2008/09 downturn (see Figures 3a and 3b). Therefore, the difference between the actual and the nominal cyclically adjusted debt ratio shown in Figure 3c is relatively small. Contrary to Italy, the significant decline in the interest spending ratio was (on average) not offset by lower primary surplus ratios as can be seen in Figures 3d and 3e, respectively. As a result, government debt fell from around 115% to below 90% of GDP in 2007, and this decline was driven only to a very limited extent by cyclical factors. It is noteworthy that Belgium shows negative gaps to the debt reduction benchmark throughout the pre-crisis period, both in actual and cyclically adjusted terms as is highlighted in Figure 3f. Contrary to Italy, Belgium therefore can be seen as having taken advantage of pre-crisis economic good times to build buffers. Our cyclical-adjustment approach brings this out very clearly, whereas this is concealed when comparing developments in actual debt for Italy versus Belgium. Also, in the case of Belgium, emerging sizeable gaps vis-à-vis the debt reduction benchmark as of 2008/09 are explained to a significant extent by deficit-debt adjustments related to financial sector recapitalisations.

Turning to the aggregate picture, Figure 4 depicts actual and cyclically-adjusted debt developments for the two largest economies and the euro area aggregate. Government debt as a

Figure 2: Debt simulations - actual versus cyclically adjusted (Italy, 1999-2018)



(a) real GDP **(b)** GDP deflator **(c)** government debt

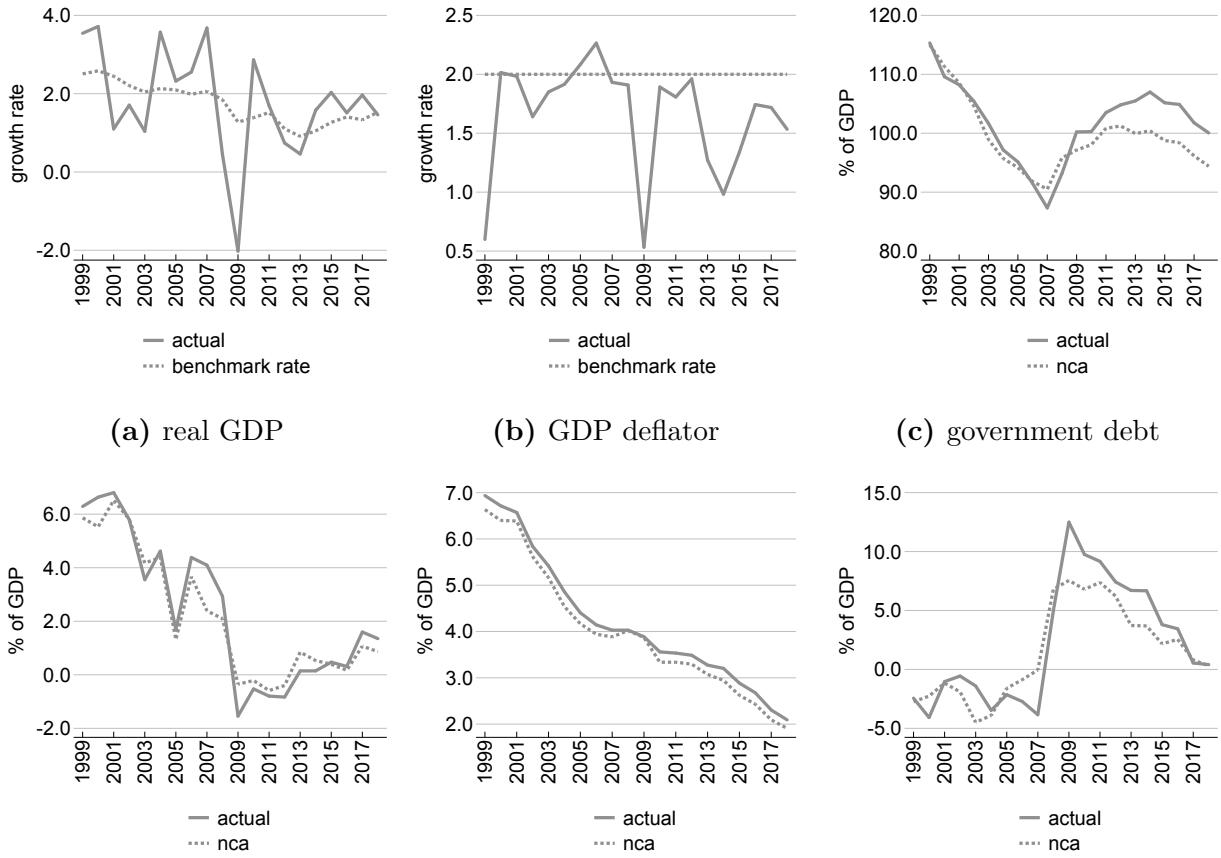
(d) primary balance **(e)** interest spending **(f)** gap to debt rule

Source: AMECO and own computations

Notes: Nominal cyclically adjusted figures are labelled "nca".

ratio to GDP developed quite similarly in Germany and France before the 2008/09 recession as shown in the middle and right row of Figure 4a. Debt ratios in both countries increased from around 60% to somewhat below 70% of GDP before the Great Recession. Inspecting the cyclically adjusted debt developments, however, reveals that in the case of France debt increases where mainly driven by weaker structural fiscal positions, while adverse cyclical developments played a dominant role in the case of Germany. This has implications for the gaps to the debt reduction benchmark (in nominal cyclically adjusted terms) as depicted in Figure 4b. While in the case of Germany gaps towards the nominally adjusted benchmark are close to zero ahead of the Great Recession, they are already quite large in France in the pre-crisis period. Gaps spike in both countries in 2009-10 but become negative in the case of Germany after 2013, while for France they return to (positive) pre-crisis levels.

Figure 3: Debt simulations - actual versus cyclically adjusted (Belgium, 1999-2018)



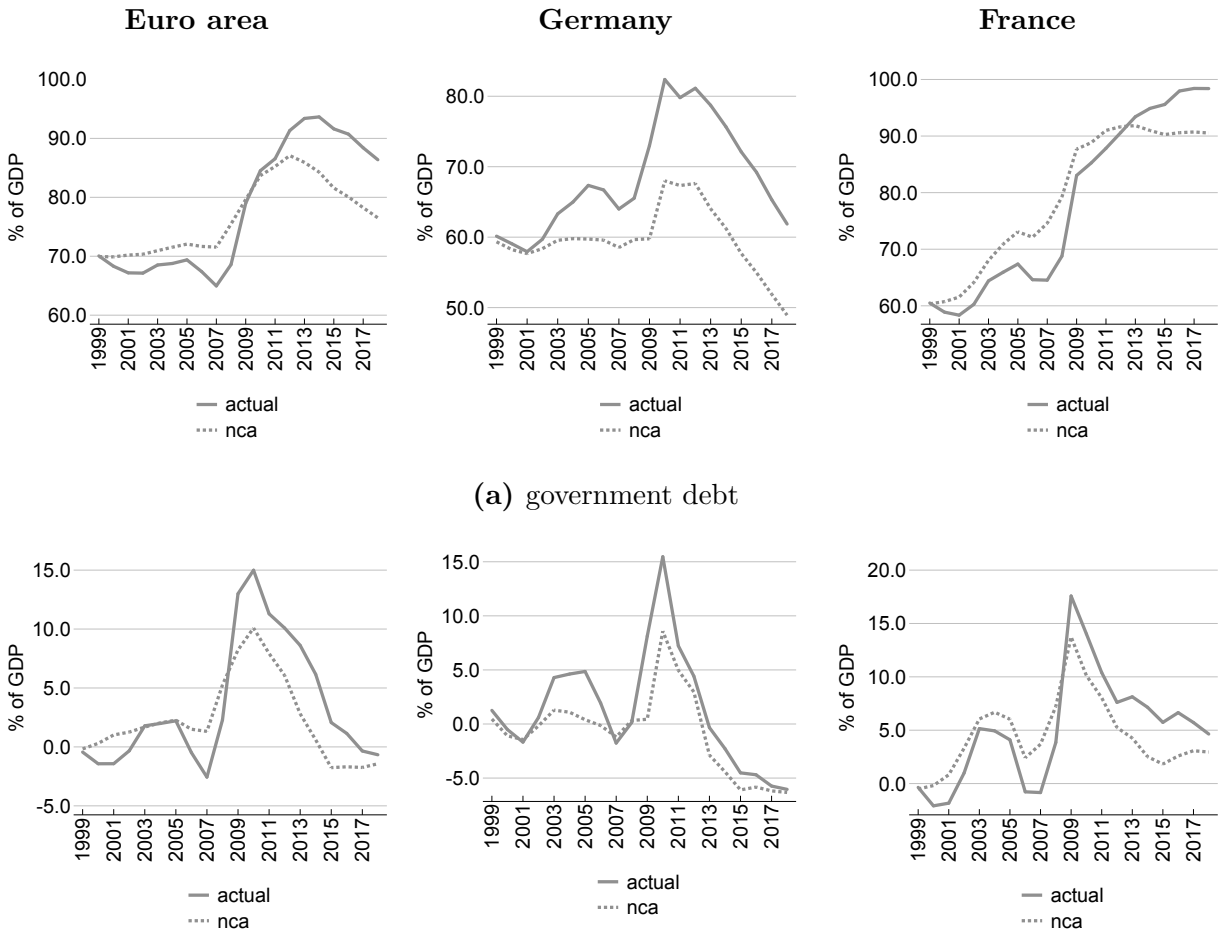
(a) real GDP **(b)** GDP deflator **(c)** government debt

(d) primary balance **(e)** interest spending **(f)** gap to debt rule

Source: AMECO and own computations

Debt developments for the euro area are shown in the left columns of Figures 4a and 4b. In cyclically adjusted terms, euro area aggregate debt remained broadly constant over 1999-2007 at a level of around 70% of GDP while actual data show a drop to around 65% in 2007, implying a negative gap vis-à-vis the debt reduction benchmark in non adjusted terms and a small positive gap in cyclically adjusted terms before the crisis. The crisis-related rise in government debt then coincides with significant increases in the gaps to the debt reduction benchmark which however start to decline again as of 2011. It is noteworthy that actual gaps to the 1/20th rule in the aftermath of the European debt crisis were significantly larger than the cyclically-adjusted ones which disappeared already in 2014, whereas actual gaps under the existing debt rule remained in positive territory until 2017.

Figure 4: Debt simulations - actual versus cyclically adjusted (1999-2018)



(a) government debt

(b) gap to debt rule

Source: AMECO and own computations

4.2.2 Backward-looking counterfactual scenarios

In order to assess the fiscal and macroeconomic implications of a hypothetical fiscal adjustment in line with the requirements of the debt rule in Italy and Belgium, this section provides counterfactual simulation analysis. Again, we focus on these two countries here because they were the ones that entered EMU with the highest levels of debt and have also been constrained by the SGP's debt rule in recent years. As explained in Section 4.1, the mechanistic simulations presented below are based on a fiscal multiplier analysis which is static in nature.[13] The counterfactual compliance scenarios assume an immediate adjust-

[13]Note that we assume that shocks to real GDP growth will not have persistent effects on the output gap. We therefore adjust potential growth rates in T+1 and T+2 in order to offset the real multiplier effect at time T.

ment in 1999 to the primary balance needed to comply (on average) with the SGP's 1/20th debt benchmark over 1999-2007, i.e. before the 2008/09 recession.[14] We specifically look at the pre-crisis period in this section because it has been argued that fiscal adjustment in the economic good times before the Great Recession could have implied the build-up of fiscal space beforehand and limited the rise in debt ratios as a result of the economic shock.

Concretely, debt targets over N periods are computed according to the following equation

$$d_{0+N} = (1-\alpha)^N (d_{t-1} - d^*) + d^* \tag{16}$$

which is parametrised in line with the current SGP debt benchmark ($\alpha = 0.05$ and $d^* = 60\%$ of GDP) while abstracting from the three year averaging for simplicity. This will remain the benchmark for now.

In a next step, the standard debt accumulation Equation (1) can be extended to N periods and solved for the (constant) primary balance ratio that if maintained ensures achievement of the intermediate debt ratio target d_{0+N}. For the backward-looking counterfactuals below we assume that the primary balance is adjusted as of 1999 according to the following target

$$pb^*_{1999-2007} = \frac{d_{1999} \prod_{t=2000}^{2007} (1+\psi_t) - d_{2007}}{\sum_{t=2000}^{2007} \left[\prod_{i=t+1}^{N} (1+\psi_t) \right]} \tag{17}$$

where d_{2007} is the debt target to be reached in 2007.[15]

Turning to the results for Italy, charts 5a - 5c compare actual developments against two different counterfactual scenarios, i.e. one that assumes compliance with the 1/20th debt reduction benchmark (labelled "$\alpha = 0.05$ (SGP)") and a second one that assumes compliance based on our nominal cyclical adjustment method described in Section 3.2 (labelled "$\alpha = 0.05$ (nca)"). As can be seen from Figure 5a, actual debt developments in Italy were in (hypothetical) compliance with the 1/20th rule until around 2002 before sizable gaps vis-à-vis the debt benchmark emerged in the years up to 2007 (see Figure 5b). Actual government debt reached around 104% of GDP in 2007 while compliance with the debt

[14] Note that the adjustment in the primary balance does not factor in contemporaneous multiplier effects ex ante. This is why the counterfactual primary balance ratio is not constant over the 1999-2007 period but shows variation which is related to GDP multiplier effects affecting the denominator and the cyclical component (see Section 4.1).

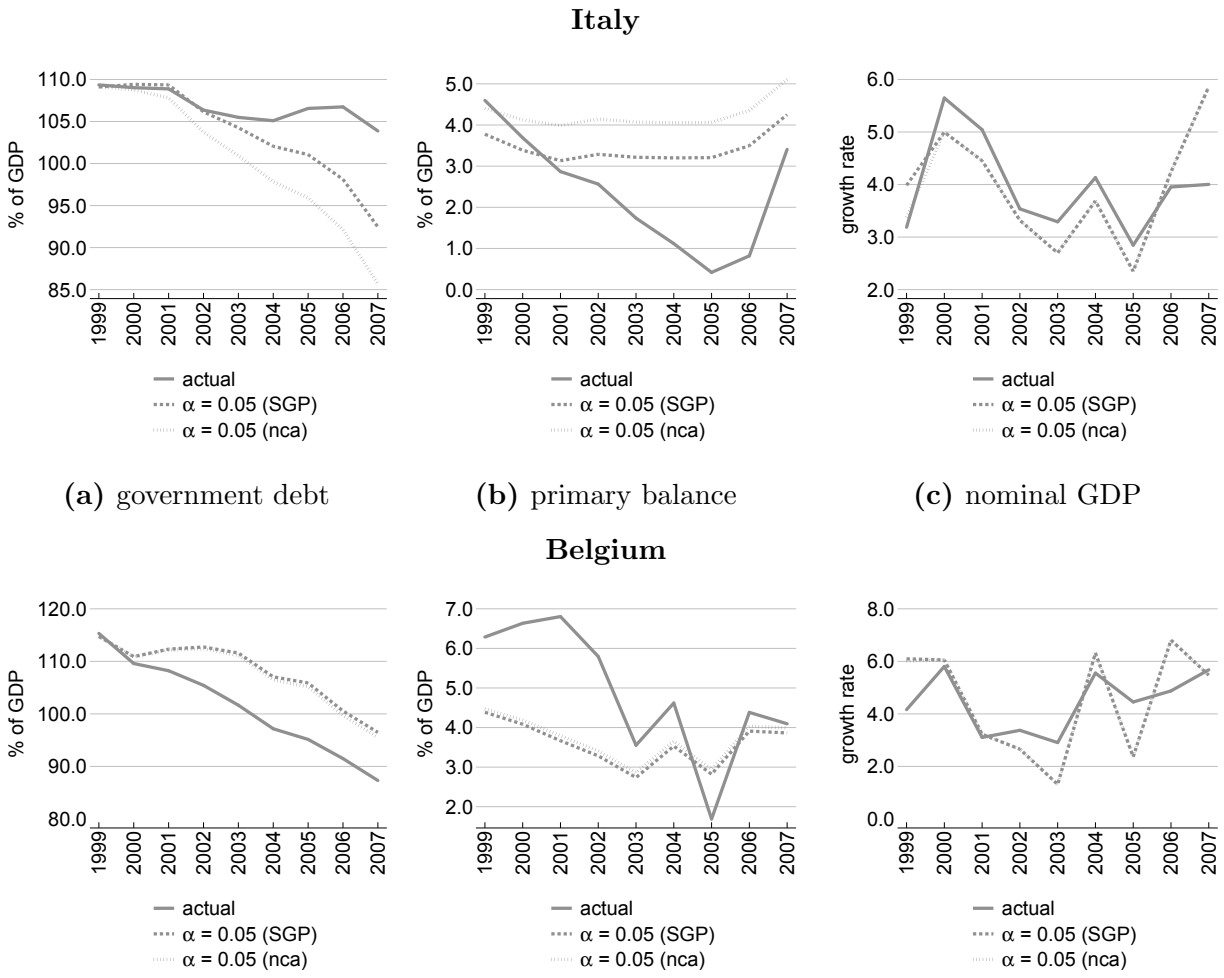
[15] Note that primary balance targets are nominally adjusted by replacing the effective interest rates ψ_t by the ones computed on the basis of the benchmark rates for growth and inflation, i.e. $\psi_t^{nca} = \frac{i_t - y_t^{npot}}{1+y_t^{npot}}$.

benchmark would have required a decline of the debt ratio to around 92%. Note that an additional debt adjustment of around 6 percentage points of GDP would have been required to comply in nominal cyclically adjusted terms, implying a drop of government debt to around 86% by 2007.

Figure 5b depicts the developments in the primary balance ratio that would have been required for actual and cyclically adjusted compliance, respectively. For the former a primary balance of on average around 3.0 % of GDP would have been necessary, while larger primary surpluses of close to 4% of GDP (on average over 1999-2007) would have been needed to comply in cyclically adjusted terms. This comparison highlights the implications of the cyclical adjustment method put forward in Section 3.2. Given that debt accumulation in Italy was alleviated by a favourable snowball effect related in particular to relatively strong GDP deflator growth (see Figure 2b), the implicit debt target for 2007 is reduced to compensate for the cyclical influence. The implication is that the rule would have prescribed Italy to roughly maintain its primary balance at the level reached at the start of EMU, i.e. saving rather then spending the ''EMU interest dividend". Figure 5c highlights the implications of the two counterfactual adjustment paths for nominal GDP growth, suggesting that macroeconomic costs of compliance with the debt rule would have been moderate.

Figures 5d - 5f show the same set of fiscal and macroeconomic variables for Belgium, again depicting the differences between actual developments and the two counterfactual adjustment scenarios. Note that for Belgium both compliance scenarios lie above the actual debt ratio development over the entire pre-crisis period, implying over-achievement over 1999-2007 (see Figure 5d). Given the limited impact of the cyclical adjustment over this period, the 2007 debt target values for the two counterfactuals are very similar at somewhat below 100% of GDP. Actual debt in 2007 stood at below 90% of GDP. Consequently, the primary balance level could have been reduced from around 5% of GDP on average over 1999-2007 to around 4% of GDP on average while still achieving compliance with the debt reduction benchmark (see Figure 5f).

Figure 5: Counterfactual adjustment scenarios (1999-2007)



(a) government debt **(b)** primary balance **(c)** nominal GDP

(d) government debt **(e)** primary balance **(f)** nominal GDP

Source: AMECO and own computations

4.3 Forward-looking simulations

4.3.1 Baseline scenarios

The forward-looking adjustment scenarios are computed equivalently to the approach for the backward-looking counterfactuals explained in Section 4.2.2. We now choose an intermediate debt target to be achieved in 2029 while the primary balance is adjusted to the respective target values in 2020. The ten year simulation horizon, i.e. 2020-2029, is similar to what the Commission presents in its 2018 FSR (see European Commission, 2019a). As explained in Section 4.1, our simulations use the latest European Commission Economic Forecast for

Table 3: Overview of adjustment requirements

					$pb^*_{2020/29}$		
	d	pb	$(i-y)^{1)}$		$\alpha =$ 0.05	$\alpha =$ 0.05	$\alpha =$ 0.03
% of GDP	2019		2019	2020 – 29		$nca^{2)}$	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
AT	69.9	1.9	-1.4	-1.0	-0.3	-0.5	-0.6
BE	99.5	0.2	-0.7	-0.4	1.3	1.2	0.7
CY	93.8	6.0	-2.0	-0.9	0.6	0.1	-0.4
DE	59.2	2.1	-1.1	-0.9	-0.5	-0.6	-0.6
EE	8.7	-0.2	-6.0	-3.6	-2.6	-2.6	-1.8
ES	96.7	-0.1	-1.0	0.0	1.5	1.2	0.7
FI	59.2	-0.3	-1.4	-1.1	-0.6	-0.6	-0.6
FR	98.9	-1.6	-1.1	-0.4	1.3	1.0	0.4
IE	59.0	1.6	-4.1	-1.9	-1.1	-1.3	-1.3
IT	136.2	1.3	1.9	1.1	4.5	4.1	3.1
LT	36.3	0.8	-4.9	-1.9	-1.5	-1.5	-1.2
LU	19.6	2.6	-3.3	-2.6	-2.0	-2.0	-1.4
LV	36.0	0.1	-3.5	-1.7	-1.7	-1.7	-1.4
MT	43.3	2.5	-4.1	-3.2	-1.9	-2.0	-1.7
NL	48.9	2.2	-2.6	-0.6	-0.7	-0.9	-0.7
PT	119.5	3.0	-0.8	0.3	2.9	2.6	1.8
SK	48.1	0.3	-2.6	-1.8	-1.3	-1.3	-1.1
SN	66.7	2.1	-2.8	-1.8	-0.9	-1.0	-1.1
EA	85.0	0.8	-0.9	-0.4	0.8	0.6	0.3

Source: AMECO and own computations

[1)] Interest-growth differentials are shown in percent.

[2)] Nominal cyclically adjusted targets are labelled "nca".

2019-21 and, as of 2022, the baseline fiscal and macroeconomic assumptions from the 2018 FSR and the Output Gaps Working Group. Assumptions regarding the fiscal multiplier are equivalent to the ones used for the backward-looking counterfactual adjustment scenarios.

Table 3 provides an overview of current fiscal positions in euro area Member States (excl. Greece) and the euro area aggregate, notably 2019 debt ratios ("d") and primary balances ("pb") (see columns (1) and (2)). Columns (3) and (4) show current and projected[16] interest-growth differentials, respectively. As highlighted in Section 2.3, $(i-y)$ constitutes

[16]Column (4) of Table 3 depicts the average projected interest-growth differential over the 2020-29 horizon.

an important determinant of the underlying debt dynamics. Columns (5) - (7) finally include target primary balances to be achieved over the 2020-29 period in order to ensure compliance with different parametrisations of the debt rule. The existing 1/20 rule is labelled ("$\alpha = 0.05$"). We also show two primary balance targets computed on the basis of our nominal cyclical adjustment method (labelled as "nca"), i.e. one requiring the SGP's 1/20 adjustment and one based on a lower speed of adjustment amounting to $\alpha = 0.03$.

It can be seen from Table 3 that for most euro area Member States primary balance ratios in 2019 - if maintained - would suffice to comply with the existing parametrisation of the SGP's debt rule. In fact, comparing columns (2) and (5) suggests that many countries could loosen their primary fiscal position. This holds true in particular for those countries that are already undershooting the debt reference level of 60% of GDP. Here, a symmetric treatment of the debt reference value as suggested in Section 2 would imply additional fiscal room for manoeuvre which could be used for example for public investment in priority areas. The same holds true for Member States like Austria or Slovenia which still have debt levels somewhat above the reference level but at the same time benefit from favourable interest-growth differentials (which are also projected to remain in negative territory for the foreseeable future).

There are however a number of euro area countries where debt exceeds the 60% reference value by a wide margin, implying the need for a significant adjustment in the primary balance ratio. This is the case in particular for Italy which is also the only country with a positive interest-growth differential of around 1% (both in 2018 and over the medium-term). In addition, high debt ratios at around 100% require sizeable budgetary improvements in Belgium, France and Spain, despite the more favourable outlook for the interest-growth differential. Under the current parametrisation of the debt rule, adjustment requirements amount to around 1.5pp of GDP in Belgium and Spain and around 3pp of GDP in the cases of France and Italy. In Italy it is questionable whether the achievement and maintenance of primary surpluses in the order of 4.5% of GDP would be feasible. Switching to our nominal cyclical adjustment method provides some but only limited relief in that respect (see column (6)). This is related to the fact that our baseline assumptions (see Section 4.1) foresee a relatively swift convergence to the benchmark rates for growth and inflation which limits the impact of the cyclical adjustment. In Section 4.3.2, we will highlight

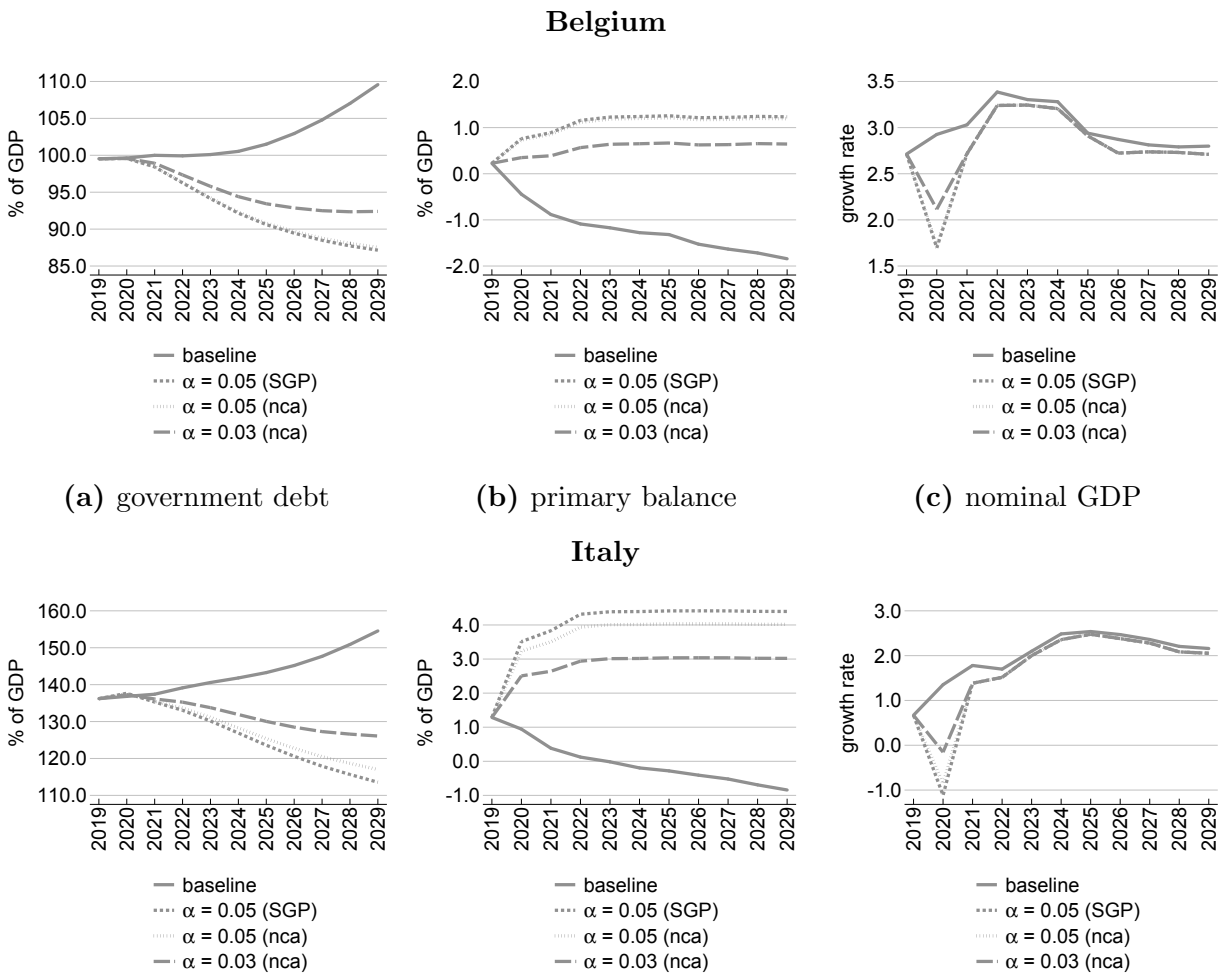
inter alia the implications of persistently low inflation with additional simulations. In our baseline scenario, only a reduction of the adjustment speed would significantly lower the primary balance target to around 3% of GDP. Imposing $\alpha = 0.03$ consequently reduces the consolidation requirement to around 1.5pp of GDP.

Figures 6 and 7 show the baseline projections together with the three adjustment scenarios for Belgium, Italy, France and Spain. These projections, which are based on a no-policy-change assumption, for all three countries show a sizeable increase in the debt-to-GDP ratio over the next ten years (of between 10 and 15pp of GDP). This increase in debt would mainly result from ageing-related spending increases and the assumption of a normalisation of interest rates. Depending on the speed of adjustment and the choice of using unadjusted versus nominal cyclically adjusted figures, debt as a ratio to GDP would decline to between 85 and 95% of GDP in Belgium, France and Spain if these countries fully complied with the respective debt rule specification (see Figures 7a and 7d).

In the case of Italy, even an adjustment in line with the current parametrisation of the debt rule would imply a debt ratio of around 115% of GDP at the end of the projection horizon. As discussed before this would require an improvement of the primary balance ratio to a surplus of around 4.5% of GDP. Figure 6f highlights that a related and immediate fiscal consolidation would have significant recessionary effects based on our standard fiscal multiplier assumptions. Moving to a somewhat lower adjustment speed of 3% of the distance to the reference value would limit these adverse macroeconomic effects to some extent. Nevertheless, in view of very high consolidation needs in the case of Italy a more gradual transition appears economically reasonable. This could be done similarly to the transition period which was granted when the SGP debt rule was introduced in 2011.

Figure 8 shows baseline and counterfactual fiscal projections for Germany and the euro area aggregate. Germany is one of the EMU countries where a favourable interest-growth differential coupled with sound fiscal positions is projected to result in a significant undershooting of the 60% of GDP debt reference value. A symmetric treatment of the latter as target rather than as upper threshold would therefore imply significant space for reducing the primary balance compared to the no-policy-change baseline, as can be seen in Figure 8b. For the euro area as a whole, debt is projected to decline until around 2024 before moving

Figure 6: Counterfactual adjustment scenarios (2020-2029)



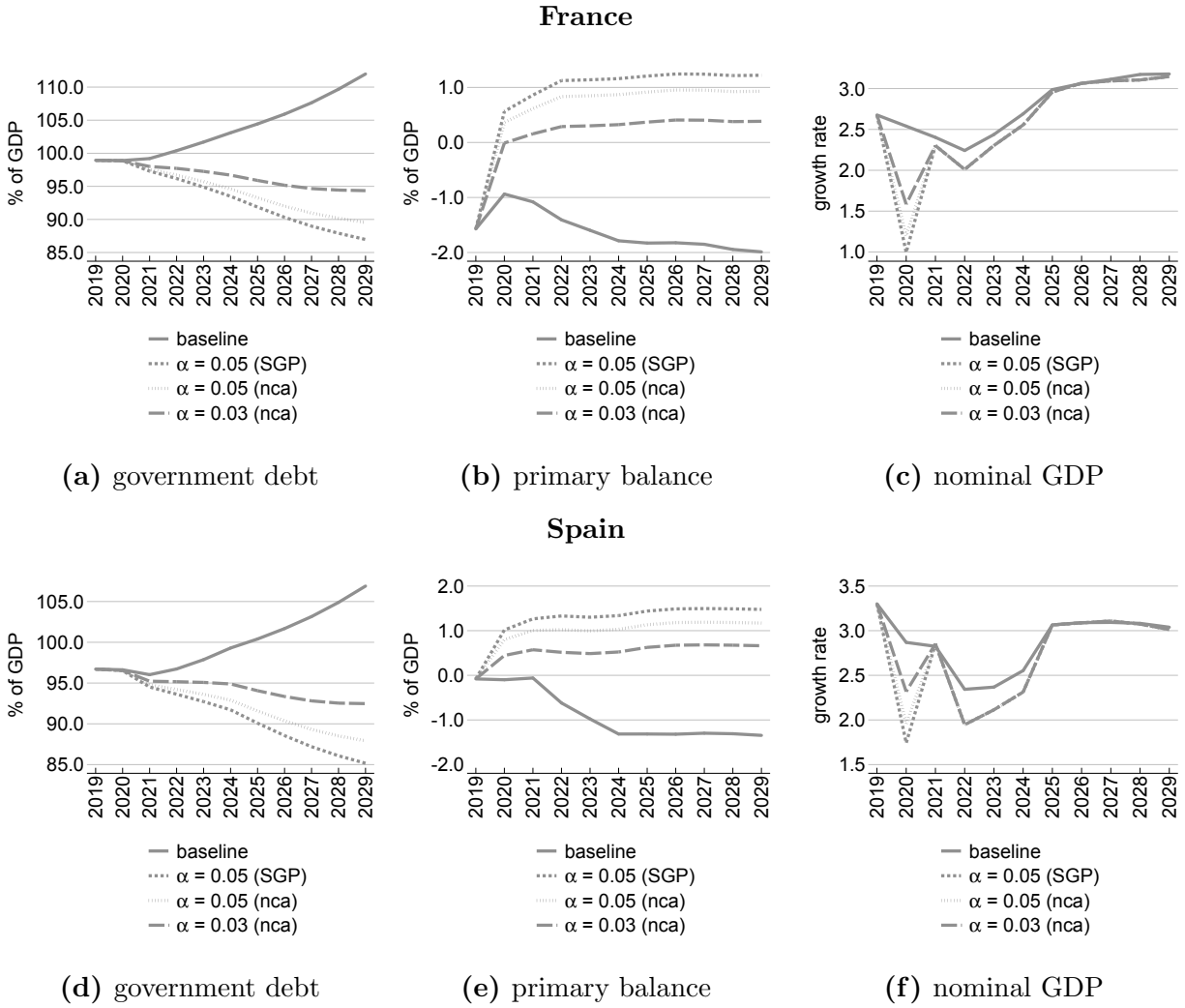
(a) government debt **(b)** primary balance **(c)** nominal GDP

(d) government debt **(e)** primary balance **(f)** nominal GDP

Source: AMECO and own computations

to an upward path again owing to the underlying assumptions related to interest rates and ageing costs. Maintaining on aggregate the current primary surplus of around 0.8% of GDP would imply a debt development in line with the 1/20 adjustment speed of the SGP over the 2020-29 period. Figure 8e shows that correcting for deviations from the growth potential and the 1% inflation norm via our nominal cyclical adjustment would provide some aggregate fiscal space at the current juncture. When combined with a lower adjustment speed, the primary balance path could lie around 0.5pp of GDP below the one required under the current parametrisation of the SGP debt rule.

Figure 7: Counterfactual adjustment scenarios (2020-2029)



(a) government debt **(b)** primary balance **(c)** nominal GDP

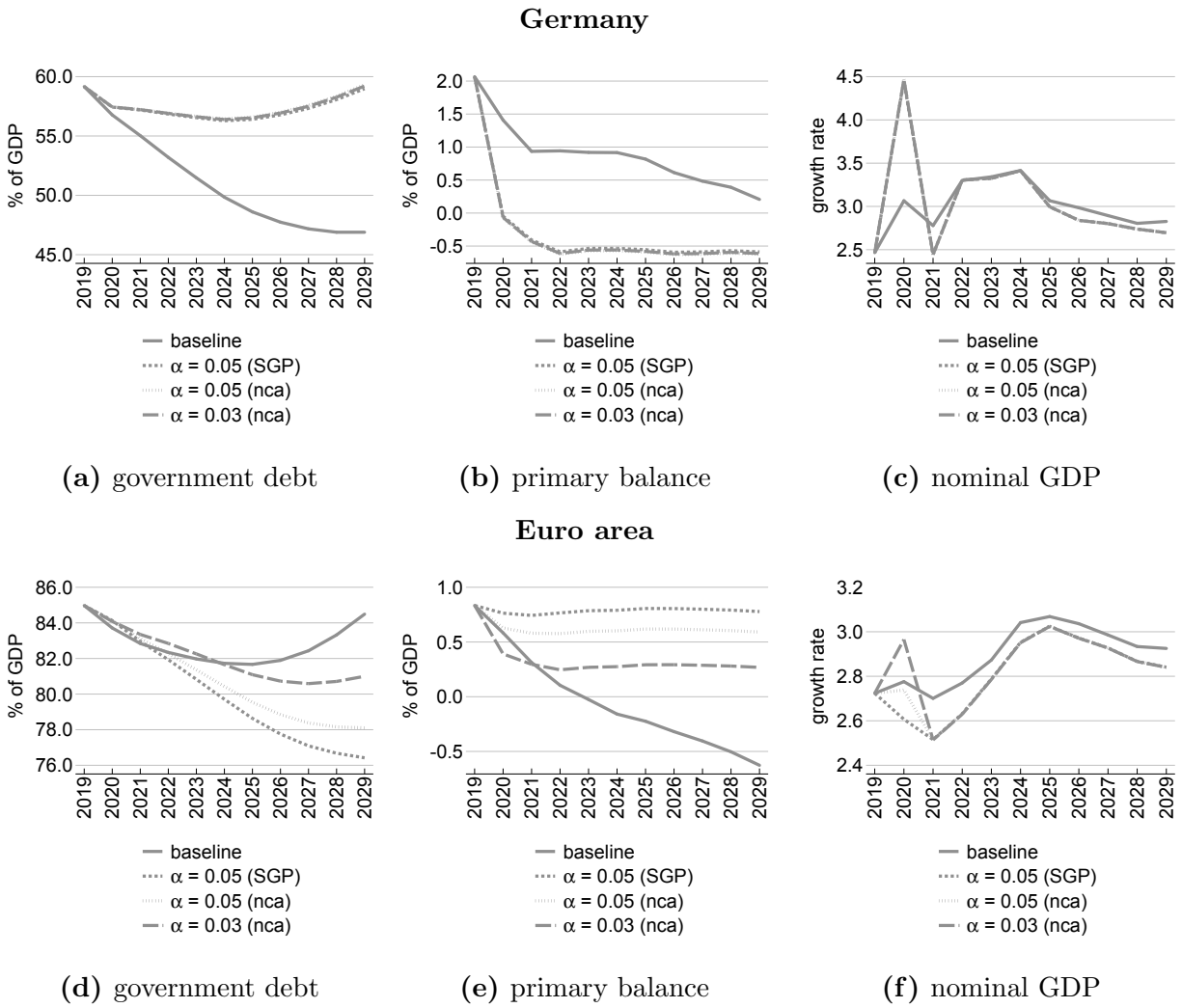
(d) government debt **(e)** primary balance **(f)** nominal GDP

Source: AMECO and own computations

4.3.2 Low for long scenarios

As discussed in Section 4.1, the baseline assumptions employed by the European Commission imply a gradual closing of output gaps, a normalisation of interest rates as well as convergence of inflation towards 2% by 2024. In this section, we provide some counterfactual simulation analysis where we deviate from the baseline assumptions regarding interest rates and inflation. Linked to the economic debate on longer-term downward trends in inflation and interest rates (see, e.g., Jorda et al., 2019 and Rachel and Summers (2019)), we show two stylised scenarios for the case of Italy.

Figure 8: Counterfactual adjustment scenarios (2020-2029)



(a) government debt **(b)** primary balance **(c)** nominal GDP

(d) government debt **(e)** primary balance **(f)** nominal GDP

Source: AMECO and own computations

First, in the "low inflation scenario" we assume that GDP deflator growth over the years 2022-29 remains at the 2021 level all other things equal (see Figure 9c). As a result, the interest-growth differential shifts up by around 1pp, which in turn adds to the accumulation of debt. By 2029, the cumulative deviation of government debt from the baseline scenario amounts to around 15pp of GDP. Complying with the 1/20 debt benchmark of the SGP would therefore require an adjustment to a higher primary balance ratio of around 5.2% of GDP (compared to around 4.5% of GDP under the baseline assumptions; see Figure 6e). Instead, the adjustment requirement based on the proposed nominal cyclical adjustment approach remains unaffected, at a primary surplus target of 4% of GDP.[17] This relates to

[17]In Figure 9, for ease of reference, we show only the nominal cyclically-adjusted benchmark for $\alpha = 0.05$.

the fact that inflation differentials vis-à-vis the the 2% inflation norm and their implications for the accumulation of debt are filtered out.

Second, in the "low interest scenario" we fix implicit interest rates at the 2021 level, again all other things equal (see Figure 9f). This implies a one-to-one reduction in the effective interest rates over 2022-29 and as a result a significantly lower need for adjustment in the primary balance ratio to around 3.2% of GDP (rather than the 4.5% under the baseline assumptions). Our nominal cyclical adjustment approach continues to reduce the adjustment burden to some extent (see Figure 9e) given the differentials vis-à-vis the benchmark rates for growth and inflation. However, it does not insulate the effects of changes in implicit interest rates.

In reality, of course, there are interdependencies between these scenarios, which are likely to occur simultaneously. In a combined scenario, in which both inflation and the implicit interest rate fall short by 1pp, a non-adjusted debt rule would prescribe non-adjusted primary surplus targets, while an adjusted rule would prescribe reduced primary surplus targets.

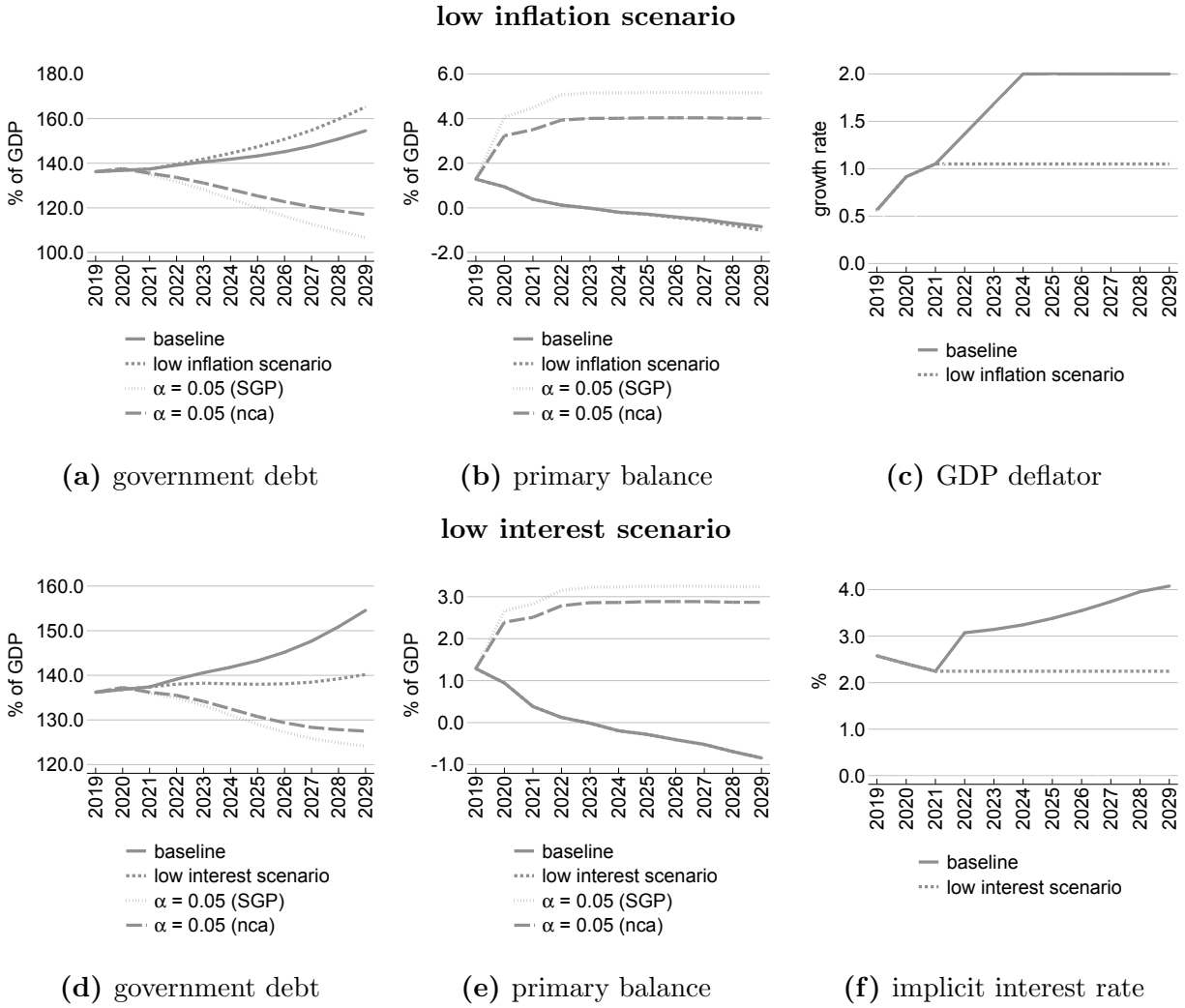
5 Conclusions

As a response to the European Debt Crisis, the Stability and Growth Pact's debt rule was introduced in 2011 to operationalise the European Treaty's debt criterion. The aim was to put a stronger emphasis on fiscal sustainability considerations. In this paper we argue that the effective implementation of the debt rule is being hindered by its in-built pro-cyclicality and very demanding adjustment requirements for high-debt countries, especially in a low growth and inflation environment.

This paper therefore proposes parametric changes to the existing debt rule which aim to remove some of its economic weaknesses, while requiring only limited changes to secondary EU legislation. First, a "nominal" cyclical adjustment, which treats fluctuations of nominal GDP around the real GDP growth potential and deviations of inflation from a 2% norm as cyclical factors, would support a modulation of adjustment requirements over the cycle. It would also help to better align fiscal and monetary policies when inflation rates remain below the price stability objective. Second, a reduction in the debt adjustment parameter

Likewise, for $\alpha = 0.03$ the primary surplus requirement would not be affected in a low inflation scenario.

Figure 9: Low for long scenarios (Italy 2020-2029)



(a) government debt **(b)** primary balance **(c)** GDP deflator

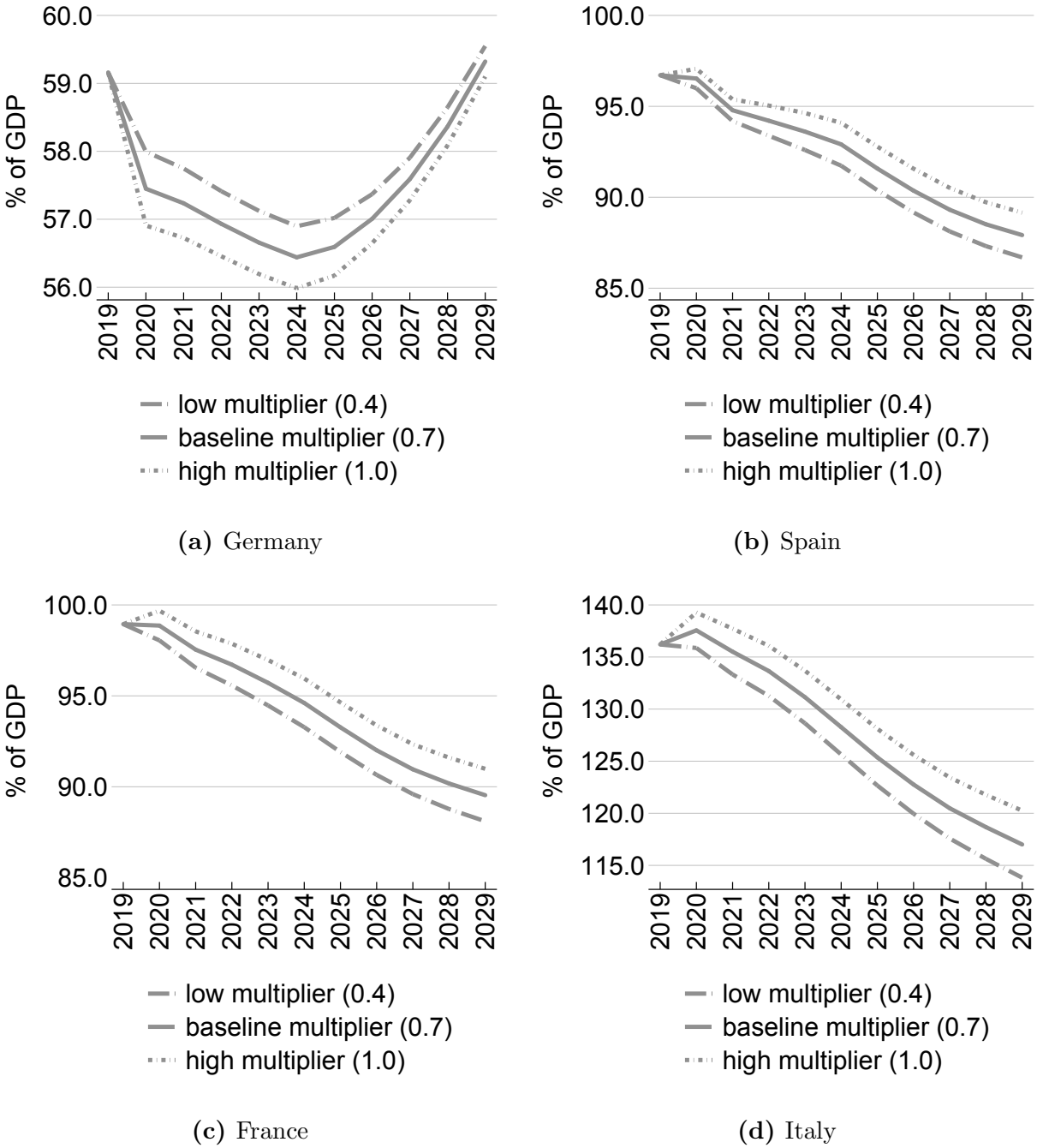
(d) government debt **(e)** primary balance **(f)** implicit interest rate

Source: AMECO and own computations

from currently 5% of the distance to the debt reference value of 60% of GDP to, for example, 3% would imply lower primary balance targets for high-debt Member States. As a result, compliance become more feasible both from an economic and political point of view. Third, a symmetric treatment of the debt reference level would imply convergence towards the debt anchor also from below. This could be useful to provide fiscal room for manoeuvre, e.g. for public investment, without requiring a specific treatment under the fiscal rule. Moreover, in a situation where monetary policy reaches the effective lower bound and debt dynamics move towards an undershooting of the debt target, additional fiscal expansion may accommodate the monetary easing to raise inflation.

A Appendix

Figure A.1: Sensitivity to fiscal multiplier assumptions



(a) Germany

(b) Spain

(c) France

(d) Italy

Source: AMECO and own computations

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