

SOME ELEMENTS FOR A REVAMPED FISCAL FRAMEWORK FOR SPAIN

Abstract

Reducing government debt levels is one of the main challenges currently faced by the Spanish economy. The current fiscal framework – both at the EU and national level – appears insufficient to ensure an adequate pace for debt reduction looking ahead. At the EU level, the preventive arm excessively relies upon unobservable indicators and is not robust to large revisions in their estimations. At the national level, the current formulation of the expenditure rule does not ensure adequate progress towards a structurally balanced budget.

This working paper sets out some elements for a revamped fiscal framework for Spain, with debt reduction at the core. The proposal is articulated around a triple time dimension – short, medium and long term – and three indicators, each characterizing one of the three horizons.

Three main features make this proposal superior to the current formulation of the fiscal framework Spain would be subject to once it exits the corrective arm of the Stability and Growth Pact. First, it is more transparent because it revolves around one single goal which is clearly stated. The fact that it is based on fundamentally observable variables that are easy to replicate and communicate also improves the transparency of the framework. Second, the framework is more consistent. The fiscal stance is set and periodically re-evaluated so that progress towards attaining the final debt target is ensured. Third, the framework is more stable and it better anchors expectations. Volatile variables play a less central role so the framework is dispensed of the instability associated to the estimation of metrics such as the output gap. This is not to say that estimations of the cyclical position are completely disregarded in the framework. But sensitivity analyses show they are introduced in a way that does not put the overall stability of the framework at stake.

From an institutional point of view, the framework envisages a strengthened role for Spain's fiscal council in an attempt to limit the areas where discretion could be exercised in a potentially spurious way.

Written by

Revised by

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[†] Spanish Independent Authority for Fiscal Responsibility

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1. Scene-setter

As Spain continues its economic recovery, reducing the crisis public debt legacy remains one of its main challenges ahead. After three years of growing above 3% in real terms, current estimates suggest that Spain may be at the onset of a new economic cycle, with the output gap coming back to positive territory in 2018 or early 2019. However, public debt remains at record-high levels hovering around 100% of GDP. In this context, debt sustainability remains a key challenge. Spain should take advantage of favorable cyclical conditions to generate fiscal buffers that could accommodate future shocks.

The current fiscal framework (both at the EU and domestic level) appears insufficient to ensure an adequate debt-reduction path for Spain. After being subject to the corrective arm of the Stability and Growth Pact since 2009, Spain is expected to enter its preventive arm shortly. At the national level, public authorities are subject to the Organic Law on Budgetary and Financial Stability, passed in 2012. Both sets of provisions suffer from flaws that could lead to either wrong policy recommendations or limited implementation. At the EU level, the preventive arm excessively relies upon unobservable indicators and its enforcement has been weak. At the national level, the current formulation of the expenditure rule does not ensure adequate progress towards the MTO when the structural balance is distant from it.¹ Moreover the two set of provisions are not fully consistent with each other, thus creating a convoluted regulatory framework. As a result, the monitoring and enforcement of the different provisions has become extremely cumbersome.

The on-going revision of the euro area architecture provides a window of opportunity for Spain to revise its domestic rules. Last December the Commission set out several proposals for deepening the Economic and Monetary Union. Prominent among them is the proposal for a Council Directive laying down provisions for strengthening fiscal responsibility and the medium-term budgetary orientation in the Member States, which opens the door for possible changes in the national legislation. It establishes that each Member State shall set up a framework of binding numerical fiscal rules which are specific to it and effectively promote compliance with its obligations deriving from the Stability and Growth Pact (see box 1 for more details on the Commission's proposal and the upgraded role assigned to independent fiscal institutions such as AIRcF).

Against this background, this note puts forward some of the desirable features of a revamped fiscal framework for Spain, where debt reduction is given a more prominent role. Section 2 provides a brief overview of some literature references on the rationale for the existence of fiscal rules and their design. Section 3 draws some lessons from the past Spanish experience. Section 4 sets out the main pillars of the proposed framework as well as some implementation details. Results of an optimization program trying to determine the optimal annual effort for Spain are presented in Section 5. Section 6 puts forward counterfactual real-time simulations of how this framework would have worked in Spain in the last 18 years, along with some sensitivity analyses. Conclusions are summarized in section 7.

¹ The Spanish expenditure rule establishes that net expenditure growth should not exceed the medium-term potential growth rate of the economy. This delivers a neutral fiscal policy which is adequate when debt levels are not excessive and the underlying fiscal position is balanced. However, this ceiling delivers too lax a policy when an adjustment is necessary.

Box 1: **Commission's** Proposal for a Council Directive laying down provisions for strengthening fiscal responsibility and the medium-term budgetary orientation in the Member States

Last December the Commission put forward a proposal to integrate the substance of the Treaty on Stability, Coordination and Governance (TSCG) into the Union legal framework.

The TSCG was signed on 2 March 2012 by 25 Contracting Parties (all Member States except the Czech Republic and United Kingdom) and entered into force on 1 January 2013. The cornerstone of the TSCG is its Title III, which sets out the so-called 'Fiscal Compact'. Its main provision is the obligation for Contracting Parties to enshrine in binding and permanent national provisions, preferably constitutional, a balanced-budget rule in cyclically adjusted terms. In 2012, the 25 signatory Member States legally committed to incorporate the substance of that Treaty into Union law five years after its entry into force.

The proposed Directive establishes that each Member State shall set up a framework of binding and numerical fiscal rules which are specific to it and effectively promote compliance with the Stability and Growth Pact. In particular, such national frameworks shall include a medium-term budgetary objective and a medium-term growth path for government expenditure net of discretionary revenue measures, to which annual budgets shall abide. Both shall be set so that convergence towards prudent debt levels is ensured. Independent fiscal institutions are given a more prominent role in the proposed Directive. They are tasked with monitoring compliance of the national framework and assessing the adequacy of the medium-term objective and the expenditure path.

Finally, Commission's proposal establishes that the Directive shall be fully transposed by 30 June 2019.

2. The rationale for fiscal rules

The case for rules over discretion arises from the problem of time inconsistency of policy. First brought forward in the seminal paper of Kydland and Prescott (1977), the problem of time inconsistency arises since policymakers can announce a certain course of policy action to influence expectations, and then renege on their announcement at a later stage. Understanding this time inconsistency, private decisionmakers may be led to distrust policy announcements altogether. Thus, one way of solving this problem is to replace policymakers' discretion with a credible commitment to a policy rule.

The time inconsistency of fiscal policy is crystalized in the deficit bias, also linked to the common pool problem. Although many reasons have been advanced by the large literature that tries to pin down the deficit bias (Calmfors and Wren-Lewis, 2011) two explanations seem to dominate. Both relate to the common pool problem, by representing a different temporal dimension of it. The intertemporal common pool problem relates to the tendency to push out the burden of fiscal discipline to future governments or future generations. Instead, the intratemporal dimension has to do with the fact that deficit-increasing measures typically tend to favor relatively small groups (Wyplosz, 2012). These groups lobby for tax reductions or spending increases with insufficient regard to the full budgetary costs these

measures will imply. (Re)election probabilities are enhanced by catering to interest groups and hence the tendency for fiscal profligacy.

Fiscal rules aim at correcting distorted incentives and containing pressures to overspend. Since finding political support to rein in deficits may be difficult to achieve, the political process that drives the preparation, adoption and execution of the budget is intervened through the adoption of fiscal rules. Furthermore, in a currency union supranational rules are aimed at internalizing the regional cost of fiscal indiscipline and establish a framework for better coordination of the policy mix (Kumar et al, 2009). Along with fiscal rules, countries increasingly rely on independent fiscal institutions to curb the deficit bias (Beetsma et al, 2018).

Generally, fiscal rules share the feature of imposing numerical norms, usually expressed in terms of deficit caps, debt limits and expenditure ceilings. Numerical fiscal rules are widespread and come in a large variety of forms that can be systematized in few categories: debt rules, budget balance rules, structural budget balance rules, expenditure rules or revenue rules (IMF, 2018). Since the different types of rules have pros and cons there has been a tendency to combine two or more of them in later generations of fiscal rules. Thus, they tend to be more complex (Schaechter et al, 2012). The current set up of the Stability and Growth Pact is rather illustrative in this respect.

Fiscal rules are generally assessed against a set of desired features initially proposed by Kopits and Symansky (1998). Combined, these criteria are meant to ensure that the rules perform their tasks effectively – ensuring sustainability and economic stabilization – and efficiently – through simple prescriptions that are easy to communicate and enforce. Since these criteria are often found in clash with each other, selecting a fiscal rule involves determining the costs and benefits of different alternatives and trying to minimize possible trade-offs (IMF, 2018). An alternative approach places explicit weights on each criterion according to the country preferences (Carnot, 2014).

A renewed appreciation for simple fiscal rules is spreading, particularly across the EU. Reforms that made the EU fiscal framework more flexible and growth friendly have resulted in an overly sophisticated architecture. Its complexity makes it difficult to understand and enforce (Eyraud et al, 2017). Against this background, the case for simple fiscal rules structured around a fiscal anchor and one or two operational targets is becoming ever stronger.

3. Lessons from **Spain's** past

It is widely acknowledged that, during the first years of the 2000s, Spain's fiscal stance aggravated the macroeconomic imbalances that built up during that period. Recent estimates indicate Spain's positive output gap rapidly widened in the first half of the 2000s until it reached a maximum of 5.6% in 2007. At the same time Spain's private debt and current account deficit rose sharply. AIR^eF's bottom-up estimates of the fiscal stance indicate that expansionary measures cumulatively amounting to around 9% of GDP were taken in the period 2001-2008.

This partly related to wrong output gap estimations at the time. Current output gap estimates suggest the structural deficit was hovering around 2% for the most part of the period 2000-2007. Thus, with the structural balance below Spain's MTO, an effort should have been required. Instead, real-time estimates wrongly pointed to a moderate structural surplus for those years. The MTO was persistently perceived to be overachieved.

While the expenditure benchmark partly solves this by measuring the fiscal effort with a more observable indicator, it is unlikely that it would have resulted in a more countercyclical policy at the time. The expenditure benchmark would have shown that fiscal policy was being lax and procyclical instead of neutral or even restrictive as perceived then. However, it is highly unlikely that it would have resulted in a more countercyclical fiscal policy. Given that the level of the structural balance was persistently perceived to overachieve the MTO, the expenditure rule would have been suppressed at least until the structural surplus was estimated to decline to the MTO level. Government expenditure would thus have been allowed to grow above the economy's medium-term potential performance resulting in a deterioration of the underlying fiscal position.

Any rule that sets the magnitude of fiscal policy changes by comparing a target value for the structural balance with its projected level risks delivering wrong policy advice. It also risks distorting the overall discussion around fiscal policy, which should focus on the policies implemented rather than on technical aspects related to the estimation of unobservable variables. This has frequently been the case in the past. A similar problem may face us in the new cycle.

Drawing lessons from the past includes rethinking what is achievable in terms of levels of some fiscal variables. Government debt reached a minimum of 36% of GDP in Spain in 2007, after seven years of primary surpluses amounting to between 2% and 3% of GDP. Later events proved that this was not enough. While any framework that asked for higher primary surpluses would have been considered excessively restraining at the time, the extra buffers would have come in useful some years down the line.

AIR^eF's goal is to anchor the fiscal framework in a way that, first, helps avoid another round of procyclical fiscal policies and, second, sufficiently reduces debt levels. The abrogation of the Excessive Deficit Procedure together with improved economic prospects can easily lead to procyclical fiscal policies which Spain cannot afford, now less than ever. Spain's economy has proven to be fairly volatile, so there is an impending need to build enough fiscal buffers before the next shock hits again.

4. A revamped framework

This section sets out the main underpinnings of the proposed framework, while also specifying certain aspects of its implementation.

4.1. The general rule

The framework departs from the premise that ensuring debt sustainability while allowing room for the automatic stabilizers to operate constitutes the final goal of fiscal policy.² The outstanding liabilities of the consolidated government sector are generally seen as an encompassing indicator of fiscal vulnerability. In a country that faces a large government debt burden fiscal rules should target reducing the debt ratio and then stabilizing it at a prudent level. At the same time, fiscal rules should allow automatic stabilizers to perform their function of partly offsetting economic fluctuations without direct government intervention.

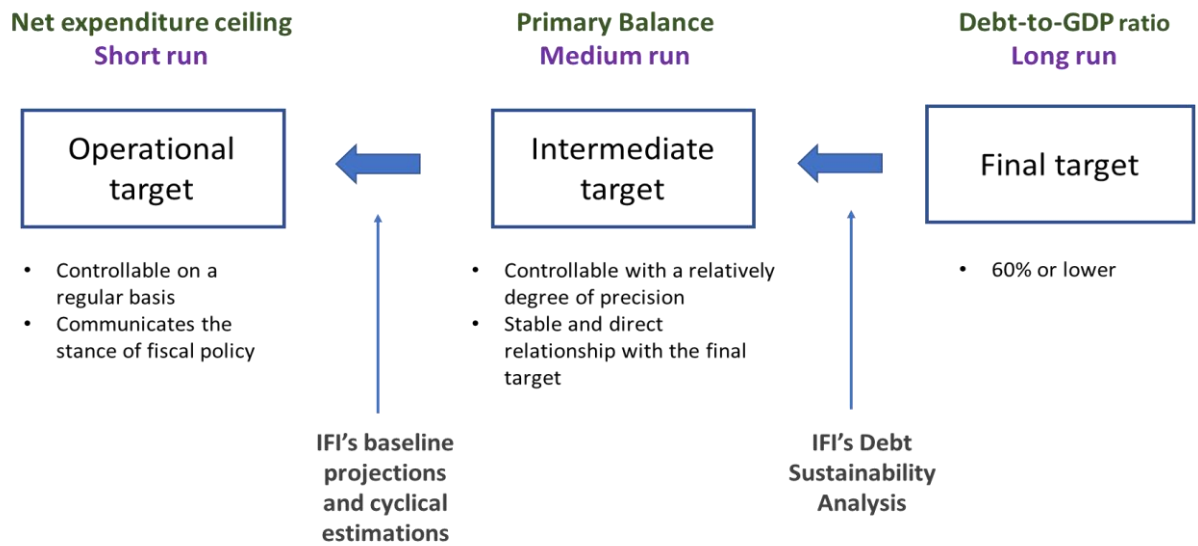
Given that goal and following Kopits and Symansky's seminal contributions, the framework should be defined in a way that is transparent, simple, flexible and internally consistent.³ The transparency feature is related to the use of observable indicators that are easy to trace and communicate. Simplicity relates to the use of few, distinct indicators against which governments' fiscal policy actions can be assessed. Flexibility implies the capacity to accommodate shocks beyond the control of the authorities by envisaging well-defined escape clauses triggered by independent institutions. Finally, the internal consistency feature requires that fiscal policy is yearly constrained in a way that is linked to its ultimate goal, i.e. ensuring sustainability while letting automatic stabilizers operate.

The framework is articulated around a triple time dimension – short, medium and long run – and three indicators, each characterizing one of the three horizons. Analogous to monetary policy the framework embeds an annual operational target for the short term, an intermediate target for the medium run and a final target in the long run (see Figure 1). Following Bindseil (2004) the operational target can be defined as an economic variable, which the authorities want to control, and indeed can control to a very large extent on a regular basis through the use of its fiscal policy instruments (i.e. the budget). It is the variable the level of which communicates the stance of fiscal policy to the public and, as such, includes an indication of the discretionary element of fiscal policy. In turn, the intermediate target is an economic variable that the fiscal authorities can control with a relative degree of precision, and which is in a stable or at least predictable relationship with the final target of fiscal policy.

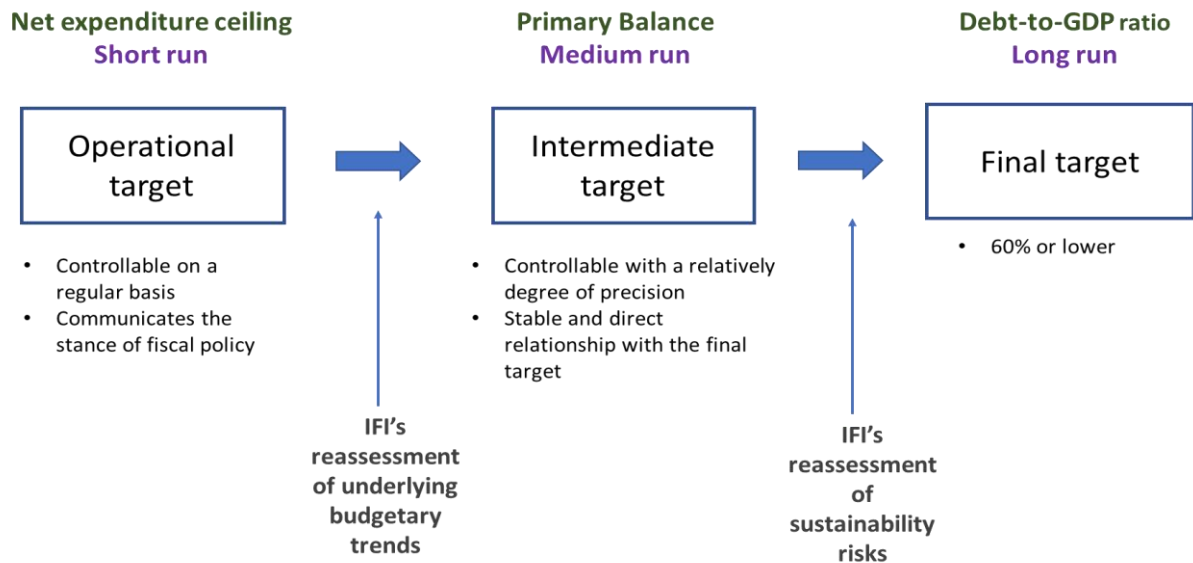
² As opposed to other possible goals such as inflation-output trade-off for instance.

³ Kopits and Symansky (1998, 2001) identify eight properties of the ideal fiscal rule, while only four of them are referred to in this note. Three of the remaining four properties are of a more political nature (well-defined, enforceable and efficient), while the adequacy feature is subsumed in the internal consistency of the framework.

Figure 1. The three horizons of the fiscal policy framework
 1.1. Determining fiscal stance ex ante (every four years)



1.2. Assessing internal consistency ex post (every four years)



Gross government debt operates as the final target and long-term anchor, crystallizing the ultimate goal of fiscal policy. The final target is expressed as a ceiling for the gross debt-to-GDP ratio towards which government debt should decline. A measure of gross rather than net debt is favored because the valuation of government assets is usually debatable, thus weighing on the transparency of the framework. The actual ceiling can certainly be no higher than 60% to fulfil the requirements of the Stability and Growth Pact, but could be lower if additional buffers are deemed necessary.⁴ While a limit on the gross debt-to-GDP ratio can be

⁴ Further work includes developing a framework to determine appropriate debt ceilings and periods to attain it.

interpreted as a broad measure of fiscal sustainability, year-to-year debt targets are unlikely to be credible or operational since they are often exposed to valuation changes and other factors outside the control of the authorities.

The intermediate target is a flow indicator of fiscal performance, that is, a level for the primary balance-to-GDP ratio. It is set relative to a norm and as a function of the economic situation. The primary balance has a straightforward, direct and stable relationship with the final target. Leaving aside stock-flow adjustments, there are just two ways of reducing debt: first, through a favorable snowball effect or second, by accumulating primary surpluses.⁵ Since relying on the former cannot be considered an adequate course of policy action, any fiscal framework that has debt reduction as its final target should focus on the evolution of primary balances. Given the debt target and the number of years to attain it – i.e. given a pace of debt reduction that is considered adequate – it is straightforward to derive the constant primary balance consistent with it (hereinafter, the primary balance norm). Since primary balances are expected to automatically deteriorate in downturns and improve in upswings, attaining the primary balance norm on average requires outperforming it during upswings. Thus, the intermediate target (IT) is a medium-term level for the primary balance-to-GDP ratio – valid for 4 years – that is derived, relative to the norm (PBN), as a function of the economic situation.⁶

$$IT_{t,t+4} = PBN + \varepsilon * OG_{t,t+4}$$

Where:

- $OG_{t,t+4}$, is the average output gap for the period t to $t+4$ as projected in $t-1$, and
- ε , is the average semi-elasticity of the government balance to the output gap
- PBN , is the constant primary balance that will hit the final debt target in a given period of time, under given assumptions of nominal growth and nominal interest rates

The primary balance intermediate target acts as an anchor for expectations ex ante, but does not imply that the government is held accountable for attaining a specific level of that variable. The latter would not be consistent with the final goal of the framework, which includes letting automatic stabilizers operate. In fact, if the government's actions were assessed against a primary balance reference, the effect of automatic stabilizers would need to be constantly counteracted. Furthermore, the control of the primary balance by the fiscal authorities is imperfect because there are lags. Instead, the primary balance intermediate target acts as an anchor for expectations and sets a benchmark for medium-term budgetary planning. Furthermore, it is the pivotal element that allows effectively translating the final target (debt reduction) into a specific metric for the operational target. It is against the latter that government's actions will be assessed (see below).

Ex post, the comparison of observed primary balances with the intermediate target allows to periodically re-evaluate the internal consistency of the framework. Assuming the required fiscal measures are implemented, if the primary balance of the previous four years missed the intermediate target on average, the cyclical calculations or revenue projections should be revised. The relationship between the three levels of the framework needs to be reassessed for the following round of 4 years. Thus, the intermediate target provides a

⁵ See Annex 1 for more details on the relationship between the final debt target and the primary balance intermediate target.

⁶ Note that the intermediate target can easily be translated into a cyclically-adjusted primary balance reference for the four-year period (i.e. analogous to the MTO)

reference against which the internal consistency of the framework can be periodically reassessed to ensure annual fiscal requirements stay aligned with the final target.

Net expenditure ceilings serve as the operational target. The difference between the baseline primary balance projection for the following year and the intermediate primary balance target yields the amount of measures to be implemented by the government on a given year. In order to avoid requiring extremely large measures, which will not be credible, some absolute limits can be added to the framework – a maximum and minimum adjustment of 1% and 0% of GDP is assumed in this case. Section 4 below provides further nuances in relation to the setting of such limits. While the upper limit precludes the framework from requiring exceptionally large adjustments, it does not mean these are proscribed by it. On the contrary, they remain a policy option. The yearly ceiling for net expenditure growth results from the fiscal effort (FE) formula below (in % of GDP):

$$FE_{t+i} = \begin{cases} \min [1; (IT_{t,t+4} - PB_{t+i}^{t+i-1})] & , \text{if } IT_{t,t+4} > PB_{t+i}^{t+i-1} \\ 0 & , \text{if } IT_{t,t+4} < PB_{t+i}^{t+i-1} \end{cases}$$

$i = 0 \dots 3$

Where:

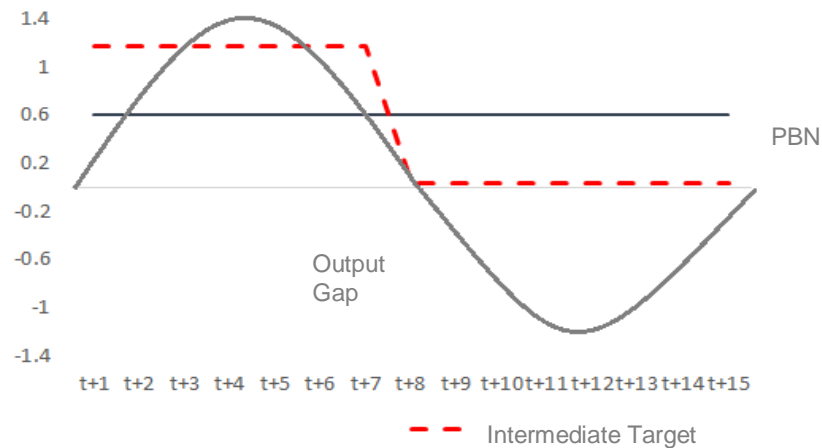
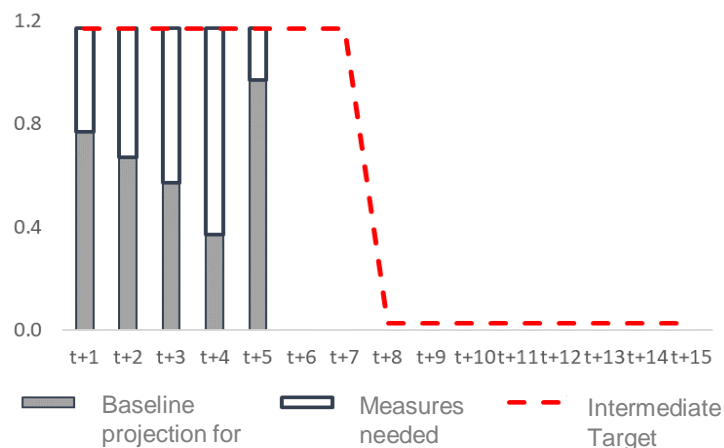
- PB_{t+i}^{t+i-1} , is the no-policy-change primary balance in year $t+i$ as projected the year before

Thus, fiscal policy is set to be contractionary or neutral. Under specific circumstances, expansionary measures can be envisaged (see below) but are in principle ruled out in the current context of normalized economic conditions and excessive debt levels. Similarly to what happens in the preventive arm of the Pact, the yearly ceiling for nominal net expenditure (NE) is derived as follows:

$$NE_{t+i} = E_{t-1} * \prod_{i=0}^3 \left[1 + pot_{t+i} - \left(\frac{FE_{t+i}}{PExp_{t+i}} * 100 \right) \right]$$

Where:

- NE_{t+i} , is the level of nominal expenditure (E) net of the budgetary impact of discretionary revenue measures
- E , is a nominal primary expenditure aggregate corrected for cyclical unemployment expenditure
- pot , is a reference for nominal medium-term potential GDP growth,
- $PExp$, is the share of government primary spending in GDP

Figure 2. Determining the fiscal stance
2.1. Determining the primary balance norm and the intermediate target (% GDP)

2.2. Determining the annual measures (% GDP)


An escape clause to be triggered by the independent fiscal institution caters for the occurrence of exceptional circumstances. Certain situations may warrant the suspension of the general framework and the adoption of expansionary measures. However, preserving the integrity and internal consistency of the framework advises that the occurrence of such circumstances be gauged by an independent institution. The magnitude by which fiscal policy can depart from the general rule – that is, from the yearly nominal ceiling resulting from the expression above – can be left open instead of resulting from an algorithm. Therefore, the independent institution could be responsible of both triggering the escape clause and recalibrating the stance of fiscal policy depending on the economic circumstances and the sustainability of the country’s public finances.

This framework is transparent, simple, flexible and internally consistent. It is transparent because it is based on fundamentally observable variables, easy to replicate and communicate. It is simple because it hinges upon three indicators, clearly connected to each other and distinctly placed relative to each other. It is flexible because it allows for exceptional

circumstances to be taken into account. And finally, it is internally consistent because the fiscal stance is set and periodically reevaluated so that progress towards attaining the final debt target is ensured.

4.2. Escape clauses

When designing fiscal rules, escape clauses are instrumental in striking the right balance between credibility of commitment on the one hand and flexibility to respond to shocks on the other hand. It is generally acknowledged that fiscal frameworks should have sufficient flexibility in their design to allow for an appropriate response to large negative unpredictable shocks. This, however, should not jeopardize the discipline imposed by the rules and their benefits in terms of credibility of government commitment. In principle, this can be achieved with well-defined escape clauses that cater for the occurrence of such shocks.

Careful design is important to avoid the abuse of escape clauses to circumvent fiscal rules. The literature on the effect of escape clauses is inconclusive. On the one hand, they can lead to lower compliance probabilities, creating loopholes that ultimately allow general government debt to rise (Reuter, 2016). However, it is also found that well-defined escape clauses render fiscal frameworks less procyclical (IMF, 2013). When it comes to their design, there are five main relevant dimensions: (i) the nature and magnitude of the shocks to be accommodated; (ii) the magnitude of the fiscal response to the shock; (iii) the length of period during which the rule would be relaxed or put into abeyance; (iv) a path of return to full observance of the rule; (v) and the responsibility for activating the clause and monitoring its implementation (Ter-Minassian, 2010).

Several reasons speak to the need for escape clauses to have some country-specific elements. Country-specific circumstances should be taken into account, such as the type of shocks the country is most exposed to and the sensitivity of certain fiscal aggregates to such shocks. Likewise, the fiscal space available to accommodate them depends on the public finances situation of the concerned country (Public Finances in EMU - European Economy 4/2010). This calls for the involvement of independent fiscal institutions in the implementation of escape clauses.

Table 1. Summary of the proposed escape clause

	What?	Who?	When?
Trigger	Acute economic recession	Fiscal Council	At the request of the MoF or on the fiscal council's own initiative
	Other events outside gov't control with a deficit-increasing impact of at least 1% of GDP		
Allowance	Neutral fiscal policy by default	Fiscal Council	One year by default and possibility to reevaluate
Return to rule	Possibility of modulating the requirement resulting from general framework	Fiscal Council	After one year by default

The trigger

Only truly exceptional circumstances should allow for the triggering of the clause. It is proposed that flexibility is closely-circumscribed to (i) acute economic recessions, or (ii) natural disasters or other events outside government's control with a negative impact in the general government balance of at least 1% of GDP. The latter threshold ensures that the extraordinary event has a major impact on public finances and thus, its occurrence is exceptional.

An independent institution could be tasked with gauging the conditions that trigger the escape clause, based on a combination of indicators.⁷ Making independent institutions responsible for triggering the escape clause is one key area where their involvement can contribute to striking the right balance between flexibility and credibility of commitment. Traditionally the projected cyclical position of an economy is gauged by looking at point forecasts of the output gap level. However large output gap revisions are found to be both frequent and asymmetric across expansions and recessions.^{8, 9} Relying on real GDP growth forecasts is not likely to improve the accuracy in estimating the projected cyclical position. In fact, it is found that output gap revisions – both in levels and changes – are mainly driven by GDP growth forecast errors rather than potential GDP growth revisions (Hernández de Cos et al, 2016). This implies that fiscal policy should be evaluated in the context of a distribution of forecasts that accounts for uncertainty.

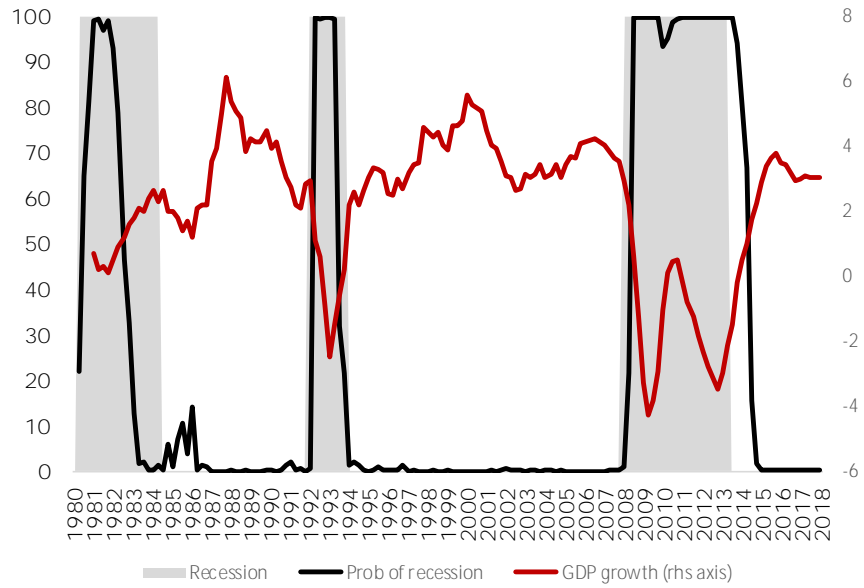
In particular, the activation of the escape clause could take into consideration the probability of recession according to AIRcF's Markov-Switching Autoregression model.¹⁰ This model – which characterizes the business cycle through a binary state variable – provides with the probability of recession in the next quarter. Its ability to anticipate cyclical upswings and downturns is very strong as shown in the figure below. A sufficient condition for the triggering of the clause could be that AIRcF's MS-AR model yields a 100% probability of recession for two consecutive quarters. Over the past, this criterion would have resulted in the triggering of the escape clause in the period 1992-1993 and 2009-2013. Looking at the evolution of government revenues can also provide additional real-time information. Actually, the year 2008 provides interesting insights in this respect: while a sharp contraction in general government revenues started to become apparent already in the second quarter of 2008, the MS-AR model would not have flashed a particularly high probability of recession at the time. That would have changed drastically in the third and fourth quarter of 2008, allowing the triggering of the clause for the year 2009.

⁷ Article 22 of Organic Law 6/2013 already tasks AIRcF with assessing the exceptional circumstances that trigger the escape clause, as currently envisaged in the Spanish fiscal framework.

⁸ Hernández de Cos et al (2016) find that real-time output gap estimates are downward-biased during expansions but upward-biased during recessions.

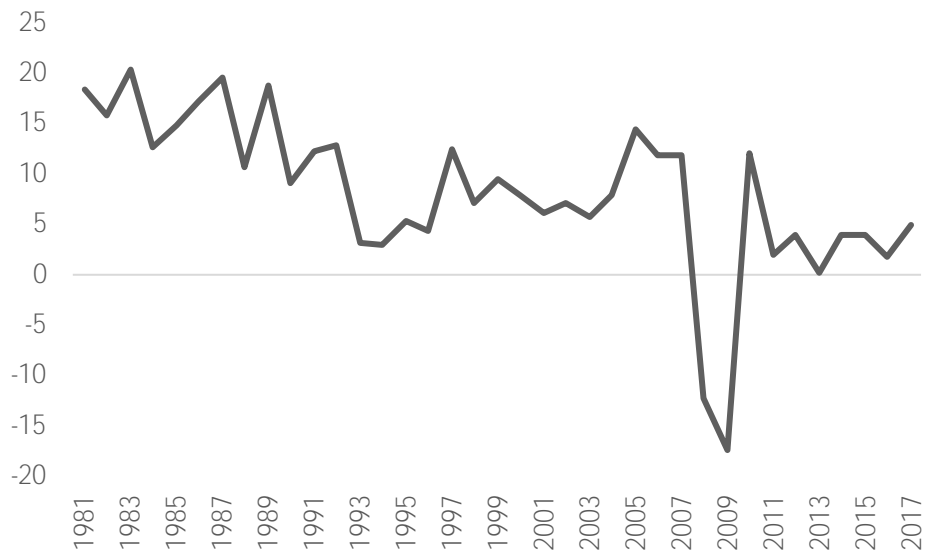
⁹ Linking the trigger of the escape clause to a certain level of the output gap can introduce large instability in the framework's results. See section 6.2 and Annex 2 for further details.

¹⁰ See Cuevas and Quilis (2017)

Figure 3. Probability of recession (%)


Source: AIRcF

Note: shaded areas represent periods of economic recession in Spain according to the Economic Cycle Research Institute (ECRI)

Figure 4. General government revenues (% var)


The allowance

The magnitude of the allowed fiscal response to the shock should be decided upon on a case by case basis. First, the fiscal allowance should depend on the type of shock that triggered the escape clause. In the event of a natural catastrophe for instance, it could be sufficient that the deviation with respect to the general rule merely allows the country to accommodate the event's temporary budgetary impact. Conversely, in case of an acute economic recession a more decisive fiscal impulse could prove necessary. In any case, the size of the allowed fiscal impulse should also depend on the country's underlying budgetary position, i.e. its available fiscal space.

It is possible to accommodate the escape clause within the general expression of the fiscal framework. Taking into account the main equations instrumental to derive the fiscal effort, activating the escape clause would be equivalent to exceptionally modifying the intermediate target for a given year. Depending on the magnitude of the allowance, the resulting fiscal effort could be neutral, expansionary or still contractionary. The escape clause should be triggered for a period of just one year at once. Nevertheless, it should be possible to trigger it for several consecutive periods on a yearly basis should the conditions that determine its activation persist.

$$IT_t^{escape\ clause} = PBN + \varepsilon * OG_{t,t+4} - allowance$$

$$FE_t^{escape\ clause} = IT_t^{escape\ clause} - PB_t$$

Return to full observance of the rules

The procedure to be followed in reestablishing fiscal discipline should be clearly established. If the proposed fiscal rule is to be restored after the escape clause has been triggered, the process and criteria governing those circumstances should be specified. Since the seminal work of Brainard (1967) the literature generally finds that abrupt policy reversals should be avoided in a context of marked uncertainty – which often prevails in the event of large negative shocks. This may be an argument for attenuated policy responses in the aftermath of a severe recession (see for instance Williams, 2013). Thus, it is proposed that the independent fiscal council retain the discretion of modulating the requirement resulting from the general framework in the year after the triggering of the escape clause.

4.3. Implementation

While good design is fundamental for the success of fiscal frameworks, no set of rules can do well if adequate surveillance mechanisms are not put in place. The effectiveness of any set of fiscal rules is strongly dependent on both adequate design and reliable enforcement procedures. The latter should refer to both the ex-ante and the ex-post dimension of the framework's implementation.

Every four years, AIRcF would derive the primary balance intermediate target, providing a medium-term underpinning for the budgetary framework. This intermediate target is in turn derived from what Spain's fiscal council considers to be an adequate debt reduction path

for the medium to long run. That is, it is set consistently with the final debt reduction target. It also includes the fiscal council's cyclical projections for the next four years.

Every year the fiscal council determines the ex-ante fiscal effort to be undertaken, based on its no-policy-change projections. In spring or summer of year $t-1$, ahead of the preparation of the budget for the coming year, the fiscal council determines the size of the fiscal effort to be implemented in year t by comparing its no-policy-change primary balance projection with the intermediate target. This is translated into a nominal ceiling for net expenditure.

Ex-post, the fiscal council produces a yearly report assessing compliance with its proposed course of fiscal policy. Any slippage with respect to the previous' year ceiling is not carried forward because yearly nominal expenditure ceilings are derived from a fixed starting value for the relevant expenditure aggregate. Cyclical estimations and revenue projections are reassessed every four years to keep the validity and internal consistency of the framework. However, these estimations play a minor role in the yearly assessment of compliance or setting of requirements.

Fiscal councils should be able to report the European Commission on the existence of gross policy errors. Regardless of the values of specific fiscal variables with regard to any possible thresholds, a procedure could be envisaged so that independent fiscal institutions report on the existence of gross policy errors that could endanger the sustainability of public finances.¹¹ The threat of an EDP opening (in case the latter could be activated not only when certain thresholds are breached but also when gross policy errors are more generally detected) could provide the necessary incentives for compliance.

¹¹ In simplified terms, the procedure could allow fiscal councils to request the Commission for an Article 126(3) TFUE report in case there are repeated breaches of the proposed course of fiscal policy.

5. Optimizing annual efforts

The framework above suggests the annual fiscal effort should be capped by a maximum and a minimum level. They are ad-hoc set to 1% and 0% of GDP. Without them, the algorithm to determine the annual effort can produce incongruous results from an economic or political economy point of view (or both). Different criteria can introduce the indispensable rationale, illustrating what is feasible or economically meaningful.

While such limits on the annual fiscal effort are common and necessary, is important to avoid arbitrariness. Past evidence on the primary surpluses Spain and its peers have been able to sustain over a certain period can provide more granularity on the setting of these limits. In the EU context, the maximum annual primary surplus attained over the past two decades was registered in Finland in 2000 at just below 10% of GDP. Since 1995 six countries have managed to sustain primary surpluses above 5% of GDP on average for at least four years (LU, SE, IT, IE, BE and FI). In the case of Spain, while its maximum primary surplus was reached in 2006 at 3.8% of GDP, an average primary surplus of 2% of GDP was maintained for nine consecutive years (1999-2007). These references, by providing a benchmark for the maximum level of the intermediate target, can in turn be translated into a maximum annual fiscal effort that is feasible.

A formalized approach, pivoting around an optimization framework, can introduce further richness in the determination of such limits. On the one hand, primary surpluses help decline governments' liabilities; on the other hand, they also tend to reduce GDP growth and thus have an adverse denominator effect. More robustness can be brought into the framework by trying to endogenously identify the annual fiscal effort beyond which the second effect prevails over the first.

The trade-off between growth and sustainability is made explicit by obtaining the optimal fiscal effort that maximizes cumulated GDP growth subject to the attainment of a debt target. Real GDP growth (g_t) is defined as a function of trend growth ($gpot_t$) and fiscal variables, including the stock of debt (b_t) and its square value (to cover for non-linearities or debt thresholds) as well as the control variable, defined as the fiscal effort (FE_t). The maximization problem is subject to three restrictions. The first one is the debt accumulation equation, with a snowball effect depending on nominal growth (gn_t) as well as nominal interest rates (i_t). The second one sets out the change in the primary balance ($pb_t - pb_{t-1}$), which is explained by its cyclical component defined as a function of the output gap ($\varepsilon * OG_t$) and the structural primary balance (previous year structural primary balance plus current effort, $spb_{t-1} + FE_t$). The third restriction states the threshold for the debt level, which is set at 60%, following the SGP framework. Growth is maximized subject to a sustainable debt path, allowing for a joint determination of the optimal effort and the cut-off period when the debt limit is achieved (end-point).

$$\max_{FE_t} g_t^T = c + gpot_t + \alpha b_t + \beta b_t^2 + \delta FE_t$$

$$s. t. \quad \left\{ \begin{array}{l} \Delta b_t = \frac{i_t - gn_t}{1 + gn_t} b_{t-1} - pb_t + sfa_t \quad (1) \\ pb_t = pb_{t-1} + \varepsilon * OG_t + spb_{t-1} + FE_t \quad (2) \\ b_T \leq 60\% \quad (3) \\ g_t^T = \sum_{i=t}^T g_i \quad (4) \end{array} \right.$$

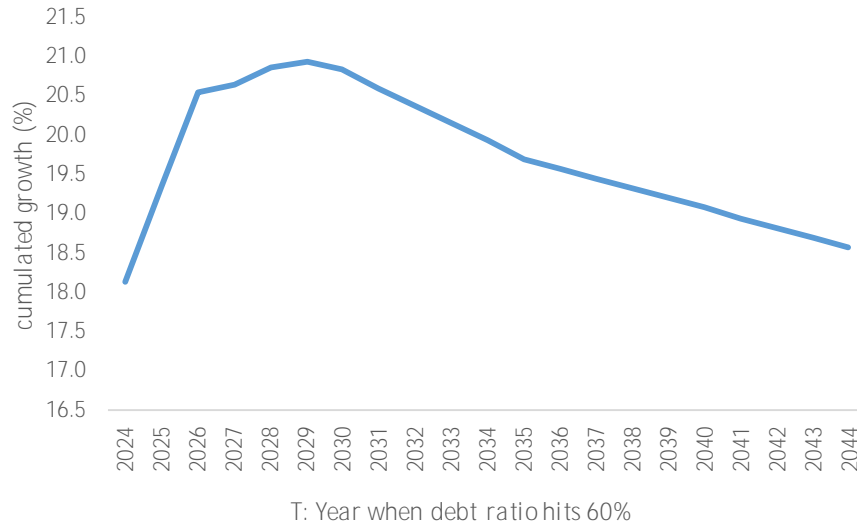
The optimization program above, captures the tangled relationship between fiscal effort, debt levels and growth. On the one hand, implementing a larger effort leads to more favorable primary balances and a faster decline in the outstanding liabilities held by the general government (equations (2) and (1)). On the other hand, assuming a positive multiplier, larger fiscal efforts lead to lower real GDP levels, as made evident in the objective function. In terms of the debt ratio, the implementation of any fiscal effort introduces sign changes in the same direction in both the numerator and denominator. Moreover, maintaining high debt levels for a long period of time can also be costly in terms of real growth. In fact, the literature on debt threshold tries to identify the levels of debt beyond which real GDP growth tends to slow down. Conclusive evidence for a debt threshold in Spain is generally not found. However, Andrés et al (2017) find that the 60% debt threshold is a prudent one, in the sense that is consistent with market expectations as measured by the sovereign yield spread. It is also the regulatory debt threshold as enshrined in the Stability and Growth Pact and the national legislation. In this vein, the debt coefficients in the objective function above are calibrated assuming the 60% of GDP threshold.

Given current conditions in Spain, with debt levels at roughly 100% of GDP and under conservative assumptions, the optimal annual effort is found at 0.5% of GDP.¹² Figure 3 represents the comparison for the optimization results yielding also different arrival points (T) for the debt threshold to be obtained. The final dates range from 2024 to 2044 and each one is associated with the effort level (FE*) that brings debt down to 60% by that date. Figure 5 represents the fiscal effort-end point combinations. The optimal effort results in the one yielding the maximum cumulated growth over the next 10 years. It is found that an annual effort of 0.5% of GDP would maximize cumulated growth over the next decade and bring debt back to the 60% of GDP threshold in 2030. Moreover, interestingly, the inverted U-shape describing the relationship between effort and growth is asymmetric. Both very much frontloaded or backloaded adjustments are detrimental for growth. However, while postponing the attainment

¹² Inflation and interest rates are assumed at 1.8% and 4.5% respectively. Following the literature on the estimation of the impact of debt on GDP growth and assuming a 60% debt threshold the α and β coefficients in the objective function are estimated at 0.03 and -0.0003 respectively, with a constant of around -0.7. The fiscal multiplier is set at 0.8 as resulting from the literature. See for instance Hernández de Cos et al. (2015) or De Castro and Hernández de Cos (2008). Finally, trend growth is assumed to converge to 1.5%.

of the debt target by just one year yields substantially higher growth rates in the short term, the growth loss associated to delaying it one year after 2030 is smaller by comparison.

Figure 5. Cumulated GDP growth over the period 2017-2027 depending on the year when the 60% debt ratio is reached



The optimal effort is ultimately dependent on the assumption on potential growth. As a policy conclusion, it should be noted that higher potential growth figures allow attaining the 60% debt level by 2030 with substantially lower fiscal efforts. As can be seen in Table 2, results above are dependent on the main determinants of the objective function and, crucially, the optimal effort is negatively related with the assumption on potential GDP growth as shown in the table below. Interestingly, the optimal end-point is very stable and located around 2029-2030 irrespective of the potential growth assumptions. While the year when the 60% debt threshold is hit varies very little, the magnitude of the effort needed to attain it changes considerably. This exercise yields interesting policy insights by linking structural reforms which yield higher potential output with lower fiscal adjustment towards stabilization.

Table 2. Optimal annual effort for different potential growth assumptions

Potential growth (% var)	Optimal effort (% GDP)	Date when debt reaches 60% of GDP
0.5	0.76	2028q4
0.75	0.72	2028q4
1	0.68	2029q1
1.25	0.64	2029q1
1.5	0.58	2029q2
1.75	0.52	2029q3
2	0.5	2029q3
2.25	0.46	2029q3
2.5	0.4	2030q3

6. Counterfactual analysis: a pseudo real-time application for Spain.

6.1. Central simulation

This section illustrates how this framework would have operated in Spain in the period 2000-2018. First, the simulation strategy is set out. Next, results are presented.

Taking 2000 as the starting point, four rounds of four years each are simulated. The intermediate primary balance target for each round is derived adjusting the primary balance norm for an estimation of the cyclical component. For each round:

- the nominal interest and GDP growth rates assumptions are those of the long run (i.e. 4.5 and 4% respectively).¹³
- the long-run debt target is set at 60% of GDP, in line with the requirements of the Stability and Growth Pact. A horizon of 15 years is considered in each round, consistent with the anchoring of the framework to a long-term prudent debt level. This does not imply that the attainment of prudent debt levels is permanently postponed into the future. Rather, it allows fiscal policy to be set in a smooth way bearing in mind both its medium- and long-term implications.
- the cyclical component is calculated taking a budgetary semi-elasticity of 0.5 and taking the real-time output gap estimations for the four-years period.

The fiscal effort for year $t+1$ is calculated by comparing the intermediate primary balance target with the real-time projection for the no-policy-change primary balance in year $t+1$, within the absolute limits of 1 and 0%. All measures are assumed to be taken on the expenditure side for the sake of simplicity.

Until 2009 the framework would have set a maximum annual nominal growth rate for expenditure of around 6% on average, compatible with a neutral fiscal policy stance. This compares to an observed average growth rate of 8% over the same period. Considering both the revenue and expenditure side, expansionary measures amounted to 9% of GDP cumulatively between 2001 and 2009. This simulation was deliberately done without including any lower limit for debt levels. The aim was to see how debt levels would have evolved had fiscal policy been neutral in the first years of the 2000s and how these buffers would have played later during the crisis period. Table 3 illustrates how the requirements would have been set for each round.

It is assumed that the fiscal council would have triggered the escape clause in 2009 and 2010 allowing for expansionary fiscal measures amounting to about 1% of GDP each year. This would have resulted from a yearly assessment of the magnitude of the negative shock and taking into account that the intermediate target at the time was persistently below the real-time no-policy-change baseline projections for the primary balance. Since deficit would

¹³ These assumptions are standard and conservative, since the snowball effect is assumed to be negative. They also reinforce the internal consistency of the framework. Since they play a crucial role in the way the intermediate target is linked to the final target, it is generally preferable that they are set to their long-run reference level.

have become larger than 3% of GDP in 2010 it is assumed that no further expansionary measures are taken thereafter. Instead the yearly fiscal effort is set at 0.5% of GDP (which is the minimum required for countries in the corrective arm) until the government deficit is brought back below 3% of GDP. This only happens in 2017.

Debt would have gone down to reach a minimum of around 12% of GDP in 2008, compared to the 36% minimum that was actually reached in 2007.¹⁴ Drawing lessons from the past includes rethinking what is achievable in terms of levels of some fiscal variables. Government debt reached a minimum of 36% of GDP in Spain in 2007, after seven years of primary surpluses amounting to between 2% and 3% of GDP. Later events proved that this was not enough. While any framework that asked for higher primary surpluses would have been considered excessively restraining at the time, the extra buffers would have come in useful some years down the line.

Under the proposed framework debt would have reached a peak of 60% of GDP in 2016 before starting to decline in 2017.¹⁵ The neutral fiscal stance at the beginning of the 2000s, coupled with the revenue windfalls that materialized at the time, would have led to large budgetary surpluses and very low debt levels. In turn, real GDP growth would have been lower until 2013. It is assumed that the large fiscal buffers accumulated until 2008 would have resulted in less drastic consolidation measures thereon. Consequently, real GDP would have decreased less than it actually did in the second half of the period considered. Some adjustment would have been in any case necessary to reduce deficit levels below 3% of GDP.

Results show that even though unexpected events unfolded and real-time output gap estimations were flawed, the framework consistently provided for reasonable fiscal policy recommendations. Applying the framework would have been compatible with maintaining a broadly neutral structural budgetary situation throughout the period 2001-2008. It is interesting to note that, while targeting a specific level of the structural balance would have led to procyclical loosening during that same period – since the structural balance was perceived to overachieve the MTO –, constraining the rate at which net expenditure could grow to the potential performance of the economy would have resulted in Spain maintaining a balanced-budget MTO. Paradoxically, the yearly pursuit of that specific result – with the structural balance as reference and benchmark – can result in a departure from it.

¹⁴ Including the stock-flow adjustments that occurred throughout the period considered.

¹⁵ First, the observed series for the main fiscal and macro variables are stripped of the impact of AIR^cF's bottom-up estimation of the implemented fiscal measures. These series constitute the baseline for the exercise. Second, the fiscal shocks stemming from the proposed framework are simulated as working on top of the baseline dynamics. Fiscal multipliers are conservatively assumed at 0.5 and 0.7 for the periods 2001-2009 and 2010-2017 respectively. These multipliers play a role both in the computation of the baseline and the effect of the fiscal shocks. Larger multipliers would slightly decrease the level of simulated real GDP and increase the debt ratio in the first half of the period and viceversa in the second half. For instance, multipliers of 0.7 and 1.1 for the periods 2001-2009 and 2010-2017 respectively would yield a minimum simulated debt ratio of 20% in 2008 and a maximum of just above 60% in 2016. Anyhow the impact is reduced.

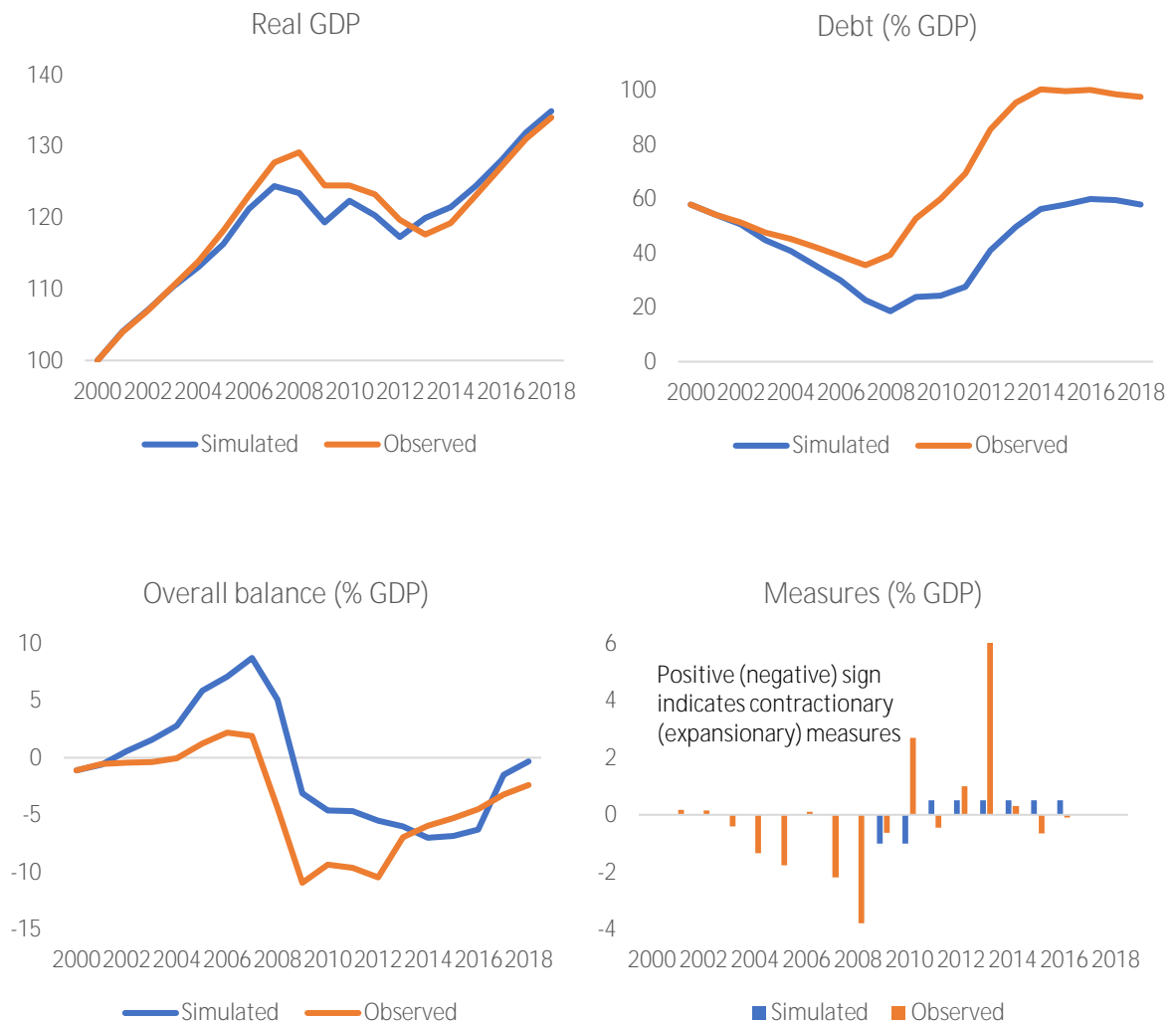
Table 3. Real-time setting of requirements for the sub-periods 2001-2004, 2005-2008, 2009-2012, 2013-2016 (assuming all requirements are delivered)

1st round		2000	2001	2002	2003	2004	(...)	2015	Average	2nd round		2004	2005	2006	2007	2008	(...)	2019	Average	
TARGETS																				
Starting debt level and final target (% GDP)		58,0						60,0		Starting debt level and final target (% GDP)		40,2						60,0		
Nominal growth assumption									4,0%	Nominal growth assumption										4,0%
Nominal interest rate assumption									4,5%	Nominal interest rate assumption										4,5%
Number of periods									15	Number of periods										15
Primary balance norm (% GDP)			0,1	0,1	0,1	0,1			0,1	Primary balance norm (% GDP)			-1,1	-1,1	-1,1	-1,1				-1,1
given that the cycle is expected to contribute by... (pp GDP)			0,6	0,2	-0,2	-0,5			0,0	given that the cycle is expected to contribute by... (pp GDP)			0,2	-0,2	-0,1	0,0				0,0
Intermediate primary balance target is (% GDP)			0,1	0,1	0,1	0,1			0,1	Intermediate primary balance target is (% GDP)			-1,2	-1,2	-1,2	-1,2				-1,2
BASELINE REAL TIME PROJECTIONS (no-policy change)		2000	2001	2002	2003	2004				2000	2005	2006	2007	2008						
OG			1,4	0,4	-0,6	-1,2				OG		0,8	-0,5	-0,3	-0,1					
Primary balance (% GDP)			2,6	2,6	2,4	2,1			2,4	Primary balance (% GDP)		2,5	2,2	2,6	2,7					
Interests (% GDP)			2,9	2,7	2,5	2,5				Interests (% GDP)		2,0	1,7	1,4	1,3					
Overall balance (% GDP)			-0,3	-0,1	-0,1	-0,3				Overall balance (% GDP)		-0,3	-0,1	-0,1	-0,3					
Fiscal Effort			0,0	0,0	0,0	0,0			0,0	Fiscal Effort		0,0	0,0	0,0	0,0					
Maximum growth for net expenditure			5,5	5,6	5,5	5,7				Maximum growth for net expenditure		6,2	6,1	6,0	6,1					

3rd round		2008	2009	2010	2011	2012	(...)	2023	Average	4th round		2012	2013	2014	2015	2016	(...)	2027	Average	
TARGETS																				
Starting debt level and final target (% GDP)		12,2						60,0		Starting debt level and final target (% GDP)		32,9						60,0		
Nominal growth assumption									4,0%	Nominal growth assumption										4,0%
Nominal interest rate assumption									4,5%	Nominal interest rate assumption										4,5%
Number of periods									15	Number of periods										15
Primary balance norm (% GDP)			-3,0	-3,0	-3,0	-3,0			-3,0	Primary balance norm (% GDP)			-1,6	-1,6	-1,6	-1,6				-1,6
given that the cycle is expected to contribute by... (pp GDP)			-1,4	-4,5	-2,7	-3,5			-3,0	given that the cycle is expected to contribute by... (pp GDP)			-4,6	-4,6	-2,2	-1,2				-3,2
reference primary balance target is			-5,9	-5,9	-5,9	-5,9			-5,9	Intermediate primary balance target is (% GDP)			-4,9	-4,9	-4,9	-4,9				-4,9
BASELINE REAL TIME PROJECTIONS (no-policy change)		2000	2009	2010	2011	2012				2000	2013	2014	2015	2016						
OG			-3,0	-8,3	-4,5	-7,1				OG		-10,4	-9,4	-4,6	-2,0					
Primary balance (% GDP)			1,0	-9,0	-7,5	-4,2			-4,9	Primary balance (% GDP)		-3,5	-4,1	-2,0	-0,5					
Interests (% GDP)			1,3	1,4	1,6	1,9				Interests (% GDP)		2,9	3,0	3,4	2,8					
Overall balance (% GDP)			-0,3	-10,5	-9,0	-6,1				Overall balance (% GDP)		-6,4	-7,2	-5,4	-3,4					
Fiscal Effort			-1,0	-1,0	0,5	0,5			-0,3	Fiscal Effort		0,5	0,5	0,5	0,5					
Maximum growth for net expenditure			7,1	3,7	3,7	4,9				Maximum growth for net expenditure		5,0	3,9	1,8	1,5					

EDP is assumed to be opened in 2011 – when the simulated government deficit would have exceeded 3% of GDP – and abrogated in 2017, when it would have gone below 3%.

Figure 6. Simulated fiscal and real variables under the proposed fiscal framework



6.2. Sensitivity analyses

Experience shows that stability is a desirable feature in any fiscal framework. Generally, the annual fiscal effort is derived from the comparison of (i) a reference level for some specific fiscal variable with (ii) its projected level. Thus, the prescribed effort – and the associated path for debt and real GDP – would change if either (i) or (ii) change. Sensitivity analyses provide a reference to gauge the stability of the framework. In particular, the debt and real GDP trajectories that would have resulted from different sources of uncertainty in the framework are simulated. They are put forward in annex 2 to this working paper while table 4 below shows a qualitative summary of the analyses' main findings.

Table 4. Summarizing the sensitivity analyses' results

Main parameters of the framework				Macro-financial assumptions		Baseline projections		
Debt target	Escape clause		Limits to effort		Snowball effect	Fiscal multipliers	Output gap	Primary Balance
	Trigger	Allowance	Max	Min				
++	+	+++	+	+++	+++	+	+	+

Note: +++ represents large sensitivity; ++ represents moderate sensitivity; + represents limited sensitivity

The different sources of variation in the framework's outcomes can be grouped into three categories. The first one relates to the calibration of the parameters that delimit the fiscal framework. They include the value of the debt target (60%, higher or lower), the characterization of the escape clause and the limits to the annual fiscal effort. The second group of simulations refer to accompanying macro-financial assumptions that are plugged into the framework. While they are not part of the framework per se, they play an important role in the results attained. They include the size and magnitude of the snowball effect and fiscal multipliers. Finally, the third group of simulations try to gauge how uncertainty in the projected no-policy-change evolution of the relevant fiscal variables impacts on the prescribed fiscal effort.

Sensitivity analyses around the main parameters of the fiscal framework can help to better pin down their values. As shown in annex 2, results are most sensitive to the minimum fiscal effort and the amount of the deviation that is allowed once the escape clause is activated. Conversely, results are less sensitive to the specific value of the debt target. This confirms the need to adequately define the escape clause and effort limits.

In turn, sensitivity exercises around the macro-financial assumptions suggest the need for introducing conservative hypothesis. The variability in the debt-to-GDP trajectories is large when the snowball effect assumption is made to vary extensively. While this is not surprising given the role the snowball effect plays in the debt accumulation equation, it confirms that the assumption made on its value to derive the primary balance norm should be conservative. This notion is reinforced by the possibility of having a period of protracted growth and inflation in the future. Conversely, when fiscal multipliers assumptions are made to diverge, this introduces less variability in the results.

While assessing the latter two sources of variation can help to better underpin the fiscal framework, it is the third source of uncertainty that is relevant to gauge the stability of the proposal. In fact, once the framework is agreed upon and put in place it is likely that its parameters are left unchanged for some time at least. However, the prescribed fiscal effort would be permanently dependent on the fiscal council's yearly projections and, in particular, on its estimation of the output gap and the baseline primary balance for the following year(s). It is against these two variables that the stability properties of the framework should be assessed.

Crucially, it is found that variability in the output gap estimates does not introduce instability in the results. In fact, the simulated debt path is quite robust to changes in the output gap estimates as shown in annex 2. The largest source of instability associated to the output gap would actually stem from a mechanic activation of the escape clause – if it was to be triggered once the output gap fell below a specific threshold – , but not from the output gap estimates per se. However, if the escape clause is triggered differently as is suggested in section 4.2 above, results are fundamentally robust to alternative output gap estimates. In this same vein, the fact that the fiscal effort is constrained within two absolute limits also minimizes the instability introduced by varying the primary balance baseline projections.

7. Conclusions

Several reasons speak to the need for a careful reflection on Spain's fiscal framework. Government debt is at its historical maximum. However, lessons from both our own past and the situation in other European peers suggest that fiscal policy risks becoming procyclical again. If debt is not substantially reduced before the next crisis hits, Spain could face sustainability problems. In this context, the on-going revision of the euro area fiscal architecture provides a window of opportunity for Spain to revise its domestic fiscal framework and gives national independent authorities (such as AIRcF) a major role in its definition, geared towards increasing national ownership and fostering transparency

Some flaws have been identified in the current fiscal framework to which Spain is subject, both in its European and national dimension. At the European level, the preventive arm excessively relies upon unobservable indicators and its enforcement has been weak. At the national dimension, the current formulation of the expenditure rule does not ensure adequate progress towards the MTO when the structural balance is distant from it.

Against this background, this working paper sets out a revamped fiscal framework that is transparent, internally consistent, simple and stable. It revolves around a triple time dimension and three distinct indicators which are clearly placed relative to each other and connected to each other. Fiscal authorities' actions can be plainly assessed and thus their accountability is enhanced. The Spanish fiscal council is given a strengthened role in the specification of the annual fiscal effort. Thus, this revamped framework leverages on the expertise and independence of fiscal councils.

While the proposed framework is assessed as superior in its design, two crucial aspects remain opened. The first one relates to its enforcement. An adequate implementation is crucial to the success of any fiscal framework. The second one has to do with its application at subnational levels of government. In a decentralized system as Spain additional arrangements must be put in place to ensure that the prescribed fiscal policy stance is overall achieved.

The ex-ante credibility of the rules hinges upon limiting the areas of the framework where discretion can be exercised by the very agent subject to the rules, i.e. the government. There are four crucial aspects where a spurious exercise of discretion could undermine the whole effectiveness of the rules: (i) the assessment of the cyclical situation, (ii) the no-policy-change projections for the primary balance, (iii) the reference for the nominal medium-term potential GDP growth, and (iv) the implementation of the escape clause. One way of limiting the exercise of discretion in these areas is tasking the independent fiscal institution with their assessment. Hence, it is proposed that Spain's fiscal council takes on a strengthened role when it comes to the implementation of the framework.

Annex 1: Primary Balances and Debt Targets

The main recursive equation determining the dynamics of the debt-to-GDP ratio is:

$$b_t = \frac{1 + i_t}{1 + gn_t} b_{t-1} - p_t$$

Where:

- b_t is debt at the end of period t as a ratio to GDP at t .
- i_t is the nominal interest rate in period t , paid in period t on the debt stock outstanding at the end of $t-1$.
- gn_t is the nominal GDP growth rate between $t-1$ and t .
- p_t is the primary balance in t as a ratio of GDP at t .

Under the assumption that i_t and gn_t are constant over time ($i_t = i$; $gn_t = gn$) and defining

$$1 + \lambda = \frac{1 + i}{1 + gn}$$

The above equation can be simplified as follows:

$$b_t = (1 + \lambda)b_{t-1} - p_t$$

This difference equation has solution:

$$b_N = b_0(1 + \lambda)^N - \sum_{t=1}^N (1 + \lambda)^{N-t} p_t$$

Given an initial debt ratio (b_0) and a target debt ratio (b_N^*) to be achieved in N periods, the constant primary balance (PBN) that reaches the target debt ratio if maintained constant during periods $t = 1, \dots, N$ is the following (from the equation just above):

$$PBN = \frac{\lambda}{(1 + \lambda)^N - 1} ((1 + \lambda)^N b_N^* - b_0)$$

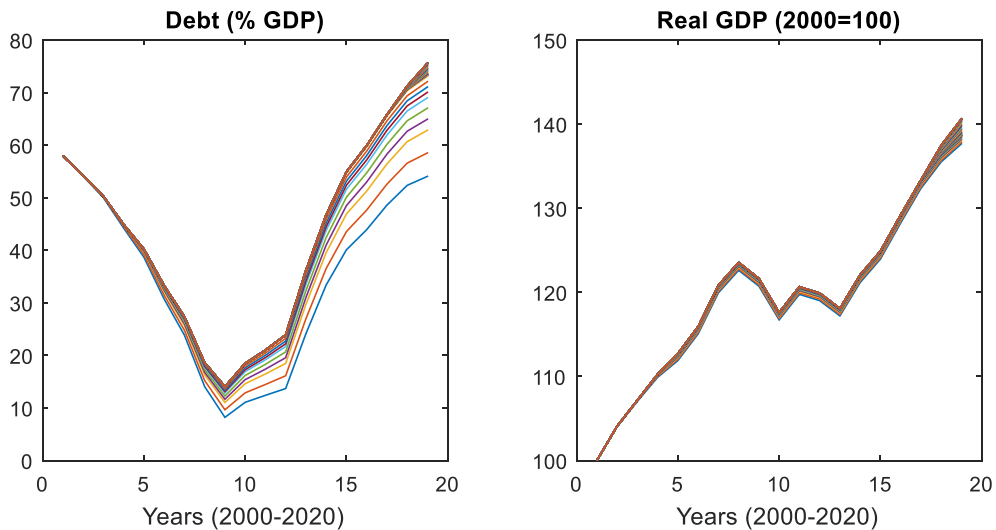
Annex 2: Sensitivity Analysis

The results of different sensitivity exercises are shown in this annex. These exercises are performed around the central simulation put forward in section 6.1 above. In this sense, they show how fiscal outcomes would have varied if, assuming the proposed framework had been abided by since the year 2000, the parameters in the framework or the baseline projections had been different.

A2.1. Sensitivity to the **calibration of the framework's** parameters: debt target, escape clause and effort limits.

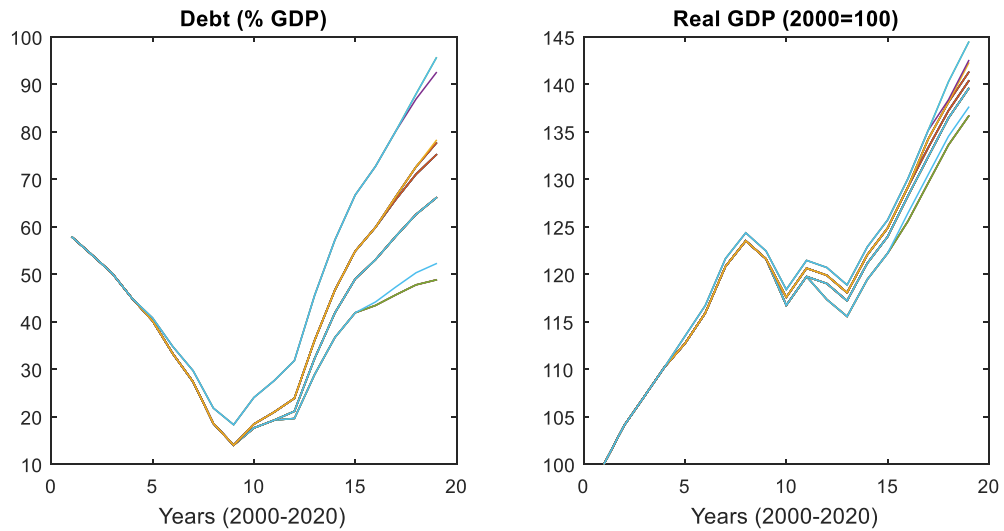
Sensitivity of the results to the final debt target is explored by making the debt anchor range between 20% and 140%. As the graph below shows this introduces some limited variability in the endpoint debt levels. In any case, debt would have been substantially lower than it is today had the framework been followed.

Figure A2.1. Sensitivity to debt target (from 20% to 140% of GDP)



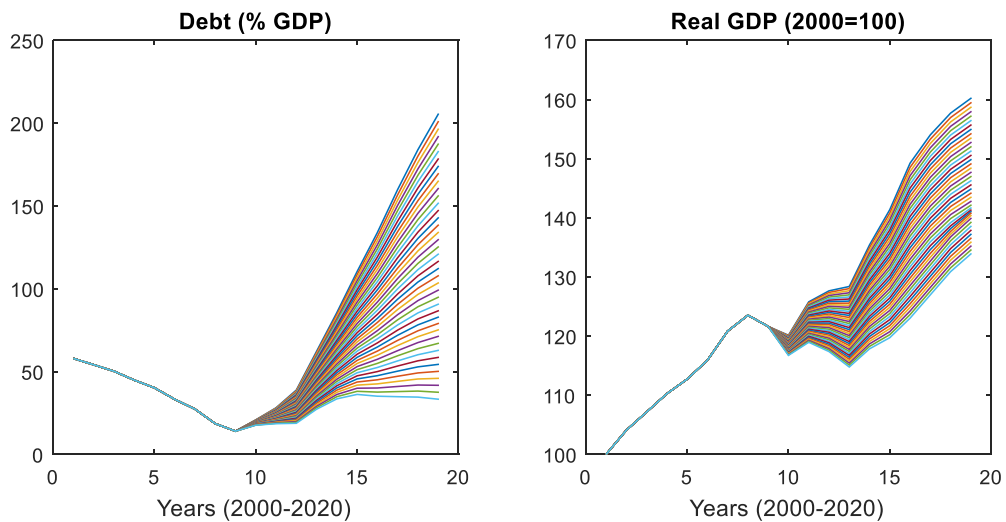
Similarly, the figure below shows the volatility of results if the trigger to activate the escape clause was related to a level of the output gap. Depending on that negative output gap threshold level (i.e. whether the escape clause triggers for wider or narrower negative output gaps) results change widely. Higher debt levels correspond to a less stringent design of the escape clause (triggered when the negative output gap is wider than -1%), while the lowest debt levels correspond to an escape clause that is more strictly defined (triggered only when the negative output gap is wider than -5%). Altogether these results suggest that the escape clause trigger should dispense of the output gap or, at least, include other indicators besides it.

Figure A2.2. Sensitivity to the escape clause trigger (from an output gap of -1% to -5%)



Finally, results are quite sensitive to the allowed fiscal expansion associated with the activation of the escape clause too. The graph below shows the variability of the results for an escape clause that is activated as in the central simulation (i.e. when the negative output gap is wider than -3%) but once it is triggered it allows a fiscal expansion that ranges between -4% and 0% of GDP. Logically results only change for the second half of the period when the escape clause would have been activated.

Figure A2.3. Sensitivity to the escape clause allowance (an annual expansion from 0% to 4% of GDP)



Finally, the maximum and minimum annual effort are made to range widely in this sensitivity exercise. While they were respectively set at 1% and 0% of GDP in the central simulation presented in section 5.1, they are made to vary between 3% and -3% now. Figure A3.4 below shows that during this particular period results are not sensitive to raising the maximum fiscal effort above 1%. This is because the difference between the baseline primary balance and the primary balance target never exceeded 1% of GDP during the period considered so, in fact, the upper limit to the fiscal effort was not binding.

Conversely, results change drastically when the minimum effort is lowered. This is relevant for those years when the baseline primary balance exceeded the primary balance target. Lowering the minimum effort implies that expansionary measures would have been allowed in those years. If so, the fiscal buffers built up during the expansionary phase of the cycle would have been insufficient. The larger the allowed expansion the higher debt would have been at the turning point of the cycle. With no fiscal buffers, debt would have exploded thereafter.

Figure A2.4. Sensitivity to maximum fiscal effort (up to 3% of GDP)

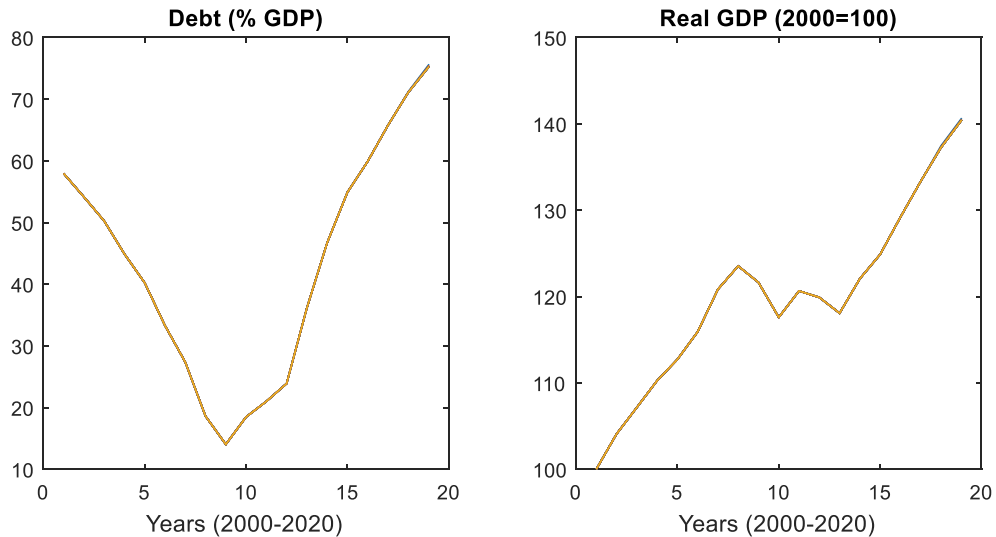
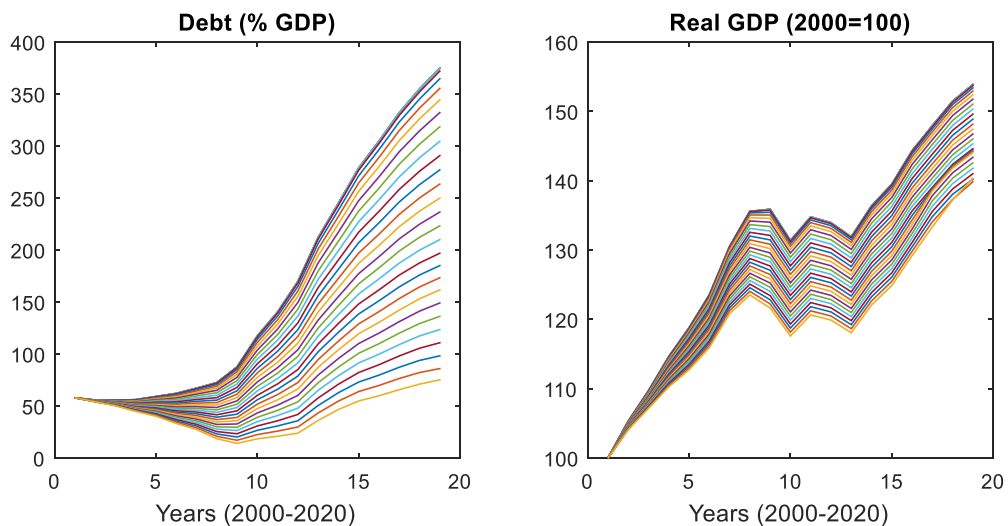


Figure A2.5. Sensitivity to minimum fiscal effort (from 0% to -3% of GDP)

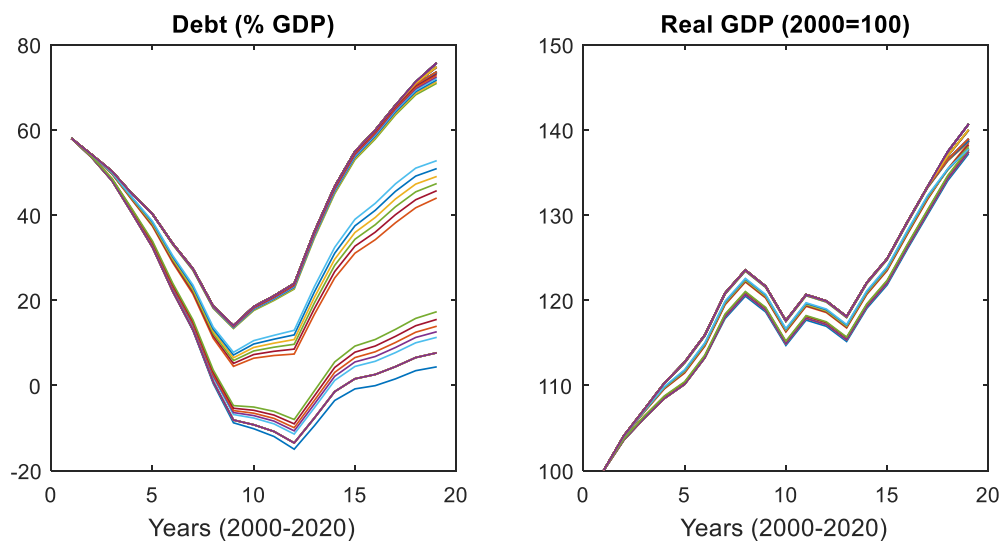


A2.2. Sensitivity to accompanying assumptions: snowball effect and fiscal multipliers.

The projected nominal GDP growth and interest rates play a crucial role in the framework, inasmuch as they determine the constant primary balance that hits the debt target in a given time horizon. While prudent assumptions underlie the central simulation (i.e. an overall negative snowball effect amounting to 0.5%) a scenario of protracted inflation and real growth is not unthinkable, particularly when conducting simulations over long time spans. Analogously, nominal GDP growth could surprise on the up side registering higher rates than nominal interests. Figures below show how debt-to-GDP and real GDP would have evolved since 2000 for different assumptions on the sign and magnitude of the snowball effect.¹⁶ This is compared to observed values, represented by the black thick line.

Very favorable snowball effects would have dropped the debt ratio to negative values, given that this simple version of the framework does not allow for expansionary policies except when output gaps are negative and large (i.e. when the escape clause is triggered). The favorable snowball effect along with the primary surpluses obtained thanks to cyclical developments and revenue windfalls would have sharply reduced debt ratios. On the other end of the snowball effect spectrum, debt would have declined at a slower pace until 2009 and would have increased at a faster pace thereafter. In any case its level would have been substantially lower than it is now.

Figure A2.6. Sensitivity to snowball effect assumptions



Fiscal multipliers assumptions play an important role too when it comes to simulate the effects of fiscal policy on macro variables. Sensitivity of the results to these assumptions is checked by making their value range between -1% and 2%, both during booms and busts. While

¹⁶ Simulations are run for eleven different assumptions on nominal GDP growth rates, ranging from -3% to 7% and taken every 1pp. For each of these eleven assumptions on nominal GDP growth rates, eight different values of nominal interest rates are simulated, ranging from 0% to 7% and taken every 1pp. Thus, debt ratio and real GDP trajectories for eighty-eight different snowball effect assumptions are simulated.

simulated real GDP values show some variability connected to the change in the multiplier, the simulated debt paths are less sensitive to changes in those assumptions.

Figure A2.7. Sensitivity to multiplier prevailing in recession

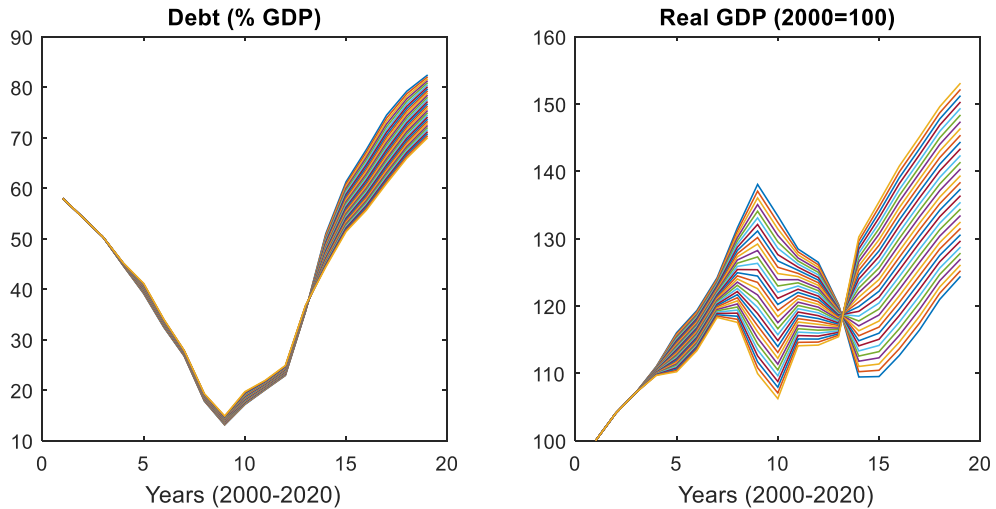
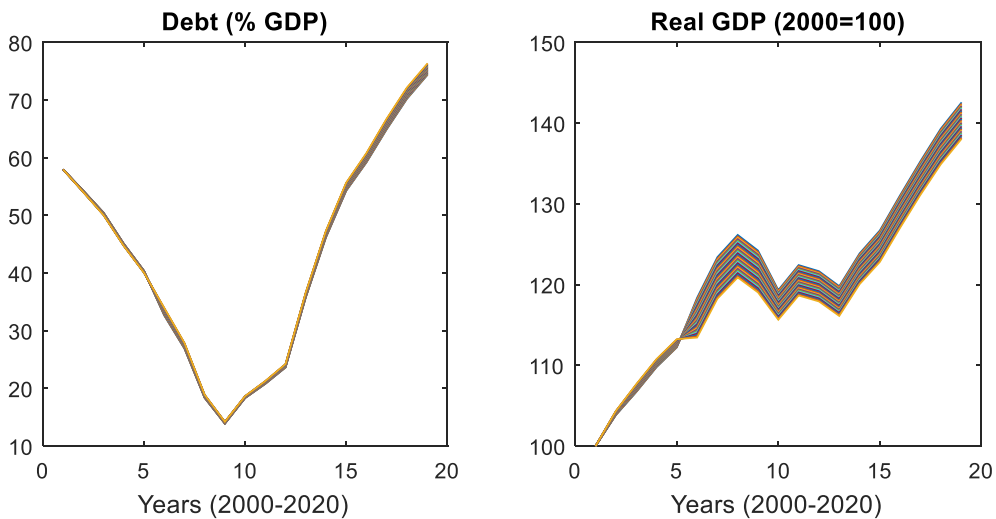


Figure A2.8. Sensitivity to multiplier prevailing in expansions



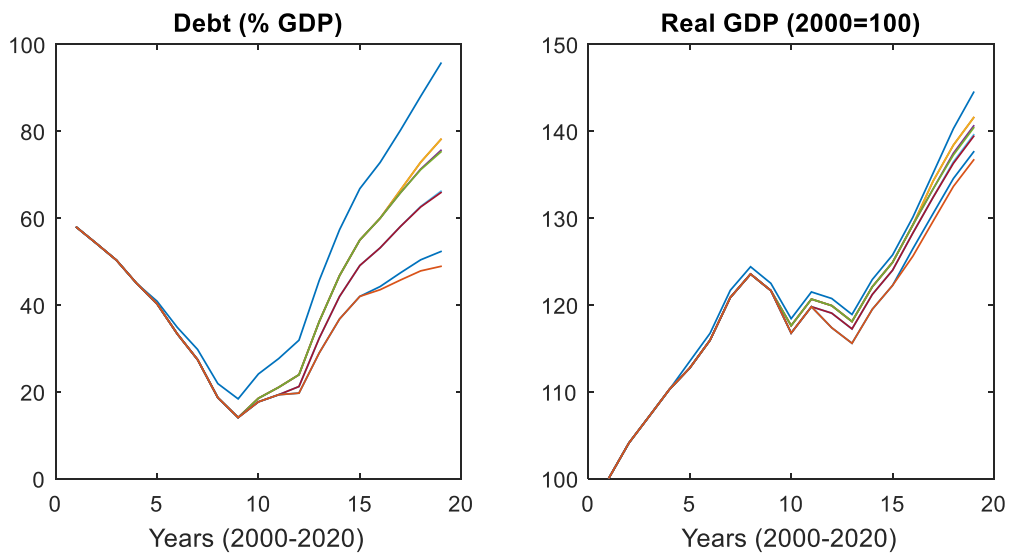
A2.3. Sensitivity to baseline projections: output gap and primary balance

Volatility in the estimations of the output gap is a source of potential problems in the operation of the fiscal framework. While dispensing of cyclical estimations altogether may not be advisable, it is important to test the robustness of the framework to the output gap projections since they can show high volatility. Even if the primary balance norm changes with the change

in the projected output gap, the actual fiscal effort to be implemented each year is not as volatile.

The graphs below show the debt and real GDP trajectories for different values of the output gap projected for the period $t+1$ to $t+4$.¹⁷ In fact, the main difference across the simulations with varying output gap estimates stems from the triggering of the escape clause. Substantial underestimations of the output gap with respect to current estimates would have resulted in the activation of the escape clause for more years and thus lead to higher debt than yielded by the central simulation in section 5.1. If the escape clause is suppressed (to gauge the volatility arising just from the output gap estimates) the difference across the alternative debt paths is much less noticeable. Debt levels would have been substantially lower had the escape clause not been activated at the worst of the recession.

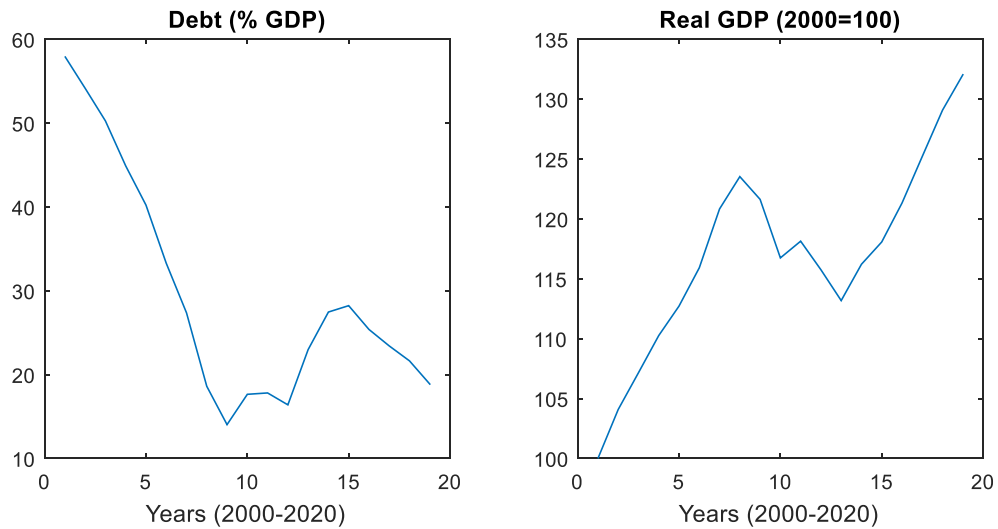
Figure A2.9. Sensitivity to estimated output gap (with an active escape clause)



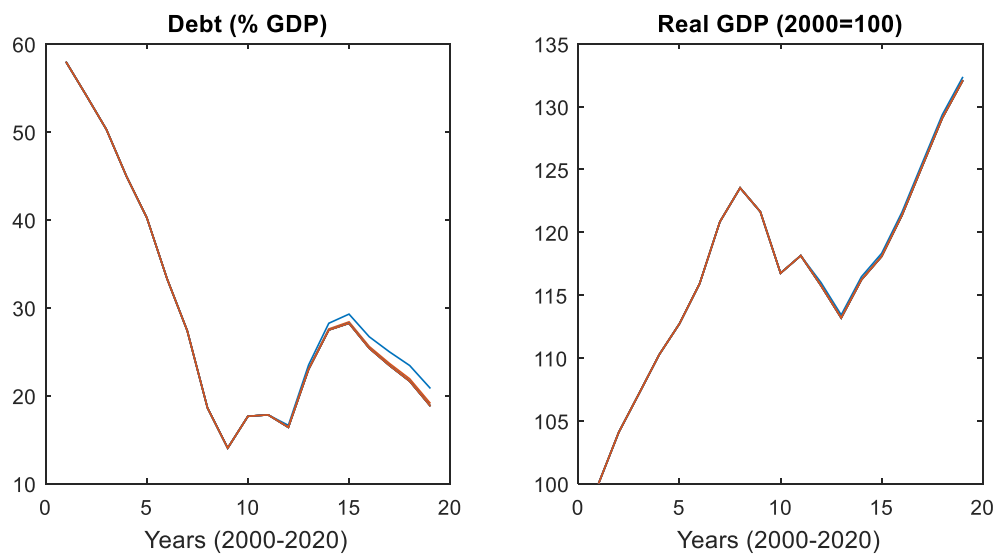
¹⁷ For each year simulations are run for 8 different values of the output gap. These are obtained by adding to the real-time output gap estimate (which is the one underlying the simulations in section 5.1) a parameter ranging from -2 to +2 and taken every 0.5 pp.

Figure A2.10. Sensitivity to estimated output gap (suppressing the escape clause)

A2.10.a) Baseline simulation suppressing the escape clause



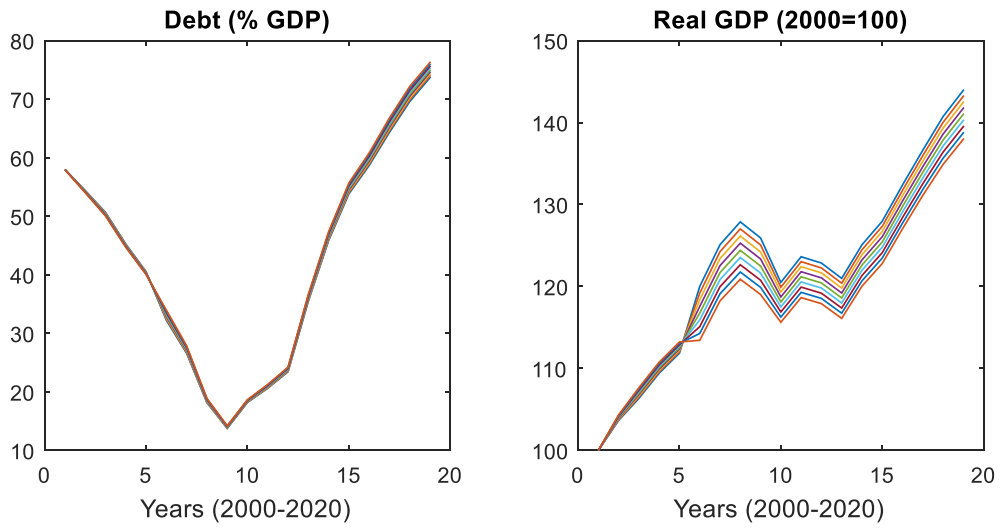
A2.10.b) Varying the estimation of the output gap and suppressing the escape clause



Finally, the figure below shows that the simulated debt path is fairly robust to changes in the baseline projections for the primary balance.¹⁸ In this case, the fact that the fiscal effort is constrained within the values of 0% and 1% minimizes the variability in the growth of net expenditure.

¹⁸ Again, for each year simulations are run for 8 different values of the baseline primary balance. These are obtained by adding to the real-time primary balance estimate (which is the one underlying the simulations in section 5.1) a parameter ranging from -2 to +2 and taken every 0.5 pp.

Figure A2.11. Sensitivity to primary balance baseline projections



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