Estudios sobre la Economía Española

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CARMEN MARÍN
DIEGO MARTÍNEZ

Estudios sobre la Economía Española 2024/15
**Junio 2024**

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# The public debt of the Spanish regions. Estimates of their fiscal consolidation efforts and scenarios of future evolution*

Carmen Marín (FEDEA)

Diego Martínez (Pablo Olavide University and FEDEA)

May 2024

**Abstract**

The Spanish regional public debt to GDP ratio is the highest in Europe. In this paper, we study the evolution of the factors explaining the recent changes in this ratio from 2015 to 2023. Moreover, we estimate the fiscal consolidation efforts needed to achieve a determined level of public debt. Likewise, a macroeconomic model is calibrated to simulate the future evolution of regional public debt under different consolidation strategies. Our main conclusion indicates that fiscal consolidation efforts will be inevitably significant, if not unfeasible in some cases, to address the deleveraging process required by the reform of the European fiscal rules.

* We would like to thank Manuel Díaz, Ángel de la Fuente, Julio López-Laborda, Jorge Onrubia, four anonymous referees and the editor for their helpful comments and suggestions. Parts of this paper has been presented in the XXV Conference on Applied Economics (Toledo, 2023) and the XI Meetings of RIFDE on Regional Public Finances (Valencia, 2024). Any remaining errors are entirely our responsibility.

# 1. Introduction

In the aftermath of the Covid-19, many advanced economies must cope with high stocks of public debt over GDP. In some cases, a significant part of such borrowing is in the sphere of subnational governments. This is the case of the Spanish regions (named Autonomous Communities in their institutional framework), which are the second most indebted regional governments in the world after the Canadian provinces. In the Euro Area, the Spanish regions are the subnational governments with the highest percentage of public debt over GDP in 2023: 22.2 percent compared to 17.7 of the Belgian regions, 15.1 of the German Lander and 5.4 of the Austrian states.

In the next coming years, the subnational governments of some decentralized countries will be involved in intense fiscal consolidation processes. As long the general governments need to reinforce the soundness of their finances, a clear implication appears regarding the sustainability of the subnational borrowing. Additionally, the situation may worsen due to the accredited fiscal risks derived from bailouts of subnational governments by the central ones (Crivelli and Staal, 2013; von Hagen et al., 2000).

Moreover, the European Union (EU) has recently achieved an agreement on its new economic governance framework (Official Journal of the European Union, 2024 a, b and c), with renewed fiscal rules more focused on the public debt to GDP ratio. This will specially affect member states where government debt exceeds 60 percent of GDP or where the government deficit exceeds 3 percent of GDP. And this is clearly the Spanish case, whose authorities will be obliged in 2024 to submit a national medium-term fiscal structural plan after finishing 2023 with a level of public debt of 107.7 percent of GDP and government deficit of 3.6 percent of GDP. In this context, the fiscal consolidation will necessarily affect the Spanish regional governments, for whom new fiscal rules will be also set up given the relevance of monitoring subnational public finances (IMF, 2020; OECD, 2020).

An additional source of interest lies in the need for reforms in the territorial financing system at the Spanish subnational level of government (Lago, 2023). Indeed, the assessment and (likely) reform of the current regional financing system should have taken place in 2014 but it is still pending. Furthermore, many Spanish regions have no access to capital markets and, as it is explained below, they have been implicitly bailed out by the central government. Under such as circumstances, the analysis of the regional public debt becomes an interesting topic to be considered, with the Spanish case as illustrative showcase.

In this precious context, this paper analyses the Spanish regional public debt from different views. Firstly, we have decomposed the factors driving its evolution over the recent years, starting in 2015 and arriving until 2023. Secondly, the paper offers an estimation of the fiscal effort to be required to the Spanish regions in order to achieve in the next years the public debt to GDP ratio laid down by the relevant legislation. And finally, we have simulated the expected path to be followed by the regional public debt in Spain under certain reasonable, calibrated assumptions.

This paper contributes to the existing literature along several avenues. Regarding the estimation of the fiscal effort needed to reduce regional public debt, based on the standard dynamic equation for debt, to the best of our knowledge, this paper has been only preceded by Makin and Pearce (2014) for the Australian states and territories. Additionally, our contribution obtains these estimations based on different expected patterns of evolution for the interest rates and the GDP growth rates, which are the ultimate variables in the analysis.

The bulk of the previous literature is focused on the estimation of fiscal reaction functions, with the aim of grasping the factors explaining how the fiscal stance of governments has been affected by the past borrowing, among others (see, for instance, Potrafke and Reischmann, 2015; Molina-Parra and Martínez-López, 2016; Li and Du, 2021). By contrast, our paper allows to define precise estimates of fiscal efforts necessary for reducing the share of regional public debt over GDP in Spain throughout different time spans.

Our main result here is that the debt requirements established by the "Ley Orgánica de Estabilidad Presupuestaria y Sostenibilidad Financiera" (Organic Law on Budget Stability and Financial Sustainability; hereafter, LOEPSF, as known in Spanish) are unfeasible within a medium term. The primary fiscal balances necessary to reduce the public debt up to legal limits are far away from its historical values.

The paper also adapts a nationwide macroeconomic model to the Spanish regional case to simulate the future evolution of public debt under different fiscal consolidation strategies[1]. We consider here the equilibrium implications derived from contractive fiscal policies on economic activity, interest rates, and potential GDP growth.

Our contribution here is the application of such a model at regional level after some technical modifications. The model has been also recalibrated to include recent economic developments and specific fiscal characteristics of the regions. In particular, we have used novel estimates of cyclically-adjusted balances for the Spanish regional governments (Díaz *et al*., 2023, 2024; Marín, 2020). As it is well-known, this is not usual in the literature on fiscal federalism and, to the best of our knowledge, the first time for the Spanish case.

The results also confirm the unfeasibility to reduce substantially the public debt to GDP ratios in many regions. While some regions, currently with lower levels of public debt, will have no problems to maintain them, for the remaining ones will be impossible to address such deleveraging.

The paper is structured as follows. In the section 2 we describe the main features of the Spanish institutional framework and the evolution of the fundamental factors explaining the recent changes in the public debt from 2015 to 2023. In the section 3, the necessary fiscal consolidation efforts to reach a determined level of debt to GDP ratio at different time frames are estimated. In the section 4, we simulate the future evolution of Spanish regional public debt under different consolidation strategies. The section 5 discusses some

[1] See Hernández de Cos et al. (2018) for a similar exercise applied to the Euro Area economies.

policy implications from our results and connected with relevant literature. Finally, some concluding remarks are summarized.

# 2. A general overview of the Spanish regional public debt

## 2.1 Institutional framework

The Spanish Constitution assigns to the regional governments, named Autonomous Communities (ACs), a wide range of spending responsibilities, among them health care, education and social services can be highlighted. Moreover, regional public policies also cope with environmental issues, public infrastructures, and housing. Consequently, about one third of the consolidated public expenditures in Spain is managed by the regional governments[2].

The territorial financing system in Spain consists of a combination of ceded and shared taxes and vertical and horizontal intergovernmental transfers. Completely ceded taxes are those in which the ACs have collection and management responsibilities and over which they can apply regulatory modifications as well. The most important are the Wealth Tax, the Property Transfer and Stamp Tax, the Inheritance and Gift Tax, the Special Tax on Certain Means of Transport, and the Taxes on Gambling. The shared taxes are the Personal Income Tax (with a participation of 50 percent over total collection and some regulatory powers on tax rates and deductions), the Valued Added Tax (shared by 50 percent and no tax power) and the excise taxes (shared by 58 percent and no tax power). A heterogeneous group of own taxes, mainly with environmental purposes and small collections, complete the set of available taxes for the ACs.

The intergovernmental transfers are financed by the central government (this is the case of the Global Sufficiency Fund, the Competitiveness Fund and the Cooperation Fund) and aimed at covering vertical imbalances and caveats of previous equalization. This preceding equalization is in principle in charge of the Guarantee Fund for Fundamental Public Services, which is quantitatively the most relevant resource for the majority of regions. Its amount is financed by the 75 percent of the ceded and shared taxes collected by the ACs and a grant from the central government; it is distributed across regions depending upon their relative spending needs, closely linked to demographic variables. In a sense, this Guarantee Fund also works as a powerful tool of horizontal equalization as long a significant part of its resources is provided by the regions according to its fiscal capacity.

Notwithstanding this, two Spanish regions, Basque Country and Navarre, are under a completely different scheme, the so-called Foral Regime. They collect and manage practically all taxes, with a high degree of tax autonomy, and pay an annual quota to the central government to finance the spending responsibilities on which the former is in

[2] A general overview of the evolution and current state of the institutional design of the Spanish federal model can be found in López-Laborda et al. (2023).

charge but benefit these two ACs as well[3]. The Canary Islands also have a slightly different regime: VAT is not applied in this region, instead they levy consumption with lower rates and enjoy specific tax expenditures in others.

The legal framework of the Spanish regional public indebtedness is given by the "Ley Organica de Financiacion de las CCAA" (Organic Law on Finance of Autonomous Communities; hereafter, LOFCA, as known in Spanish) and the "Ley Organica de Estabilidad Presupuestaria y Sostenibilidad Financiera (LOEPSF)". The former sets up two key conditions; the first one is an explicit golden rule: the resources from indebtedness must be used in capital expenditures, with some quantitative limits in terms of the maximum spending which can be devoted to interest payments and principal repayments. The second condition establishes administrative controls for issuing debt in currencies different than euro and outside the EU, reinforced when the provisions of the LOEPSF in terms of fiscal discipline are not fulfilled.

Precisely the LOEPSF introduced in 2012 some changes with respect to the framework stipulated in the LOFCA. One is that the golden rule does not apply when the regional indebtedness is in the context of the Fund for Financing Autonomous Communities (FFCCAA hereafter, according to its Spanish acronym). This Fund have been mainly developed into different branches, the most important of which is the Autonomic Liquidity Fund (FLA, in Spanish).

In principle, this Fund was created in 2012 to cover temporary liquidity problems, offering financing to the Spanish regions under better conditions than those of capital markets, but after more than a decade it has become a permanent source of resources for many ACs (Lago, 2023). In fact, the regional governments are allowed to claim funds from the FFCCAA in line with their fiscal imbalances, expected or actual. About 60 percent of the Spanish regional public indebtedness is in hands of the central government, although three regions (Madrid, Navarre and Basque Country) have not financial liabilities currently in this Fund.

The LOEPSF also states that the maximum level of regional public debt over GDP is 13 percent. Additionally, this LOEPSF prescribes the setting of annual objectives of deficit and public debt by the central government, which must be passed by the Congress and the Senate. Notwithstanding this, the fulfillment of such objectives has been far away from desired (Martínez-Lopez, 2020) and since the application of the escape clause for the years 2020-2024 because of the Covid-19 pandemic, was completely ignored.

### 2.2 General characterization

The Spanish public debt to GDP ratio has increased from 35.8 percent in 2007 to a maximum of 120.4 in 2020. In comparison with other European countries, Spain has presented the greatest increase in this ratio, which has been placed above the average EU

[3] Zabalza and Lopez-Laborda (2017) offer an analytical explanation of the differences between the Foral Regime and that of the remaining ACs.

level since 2012. The Spanish regions have accompanied the general government along this way, in which the intense decentralization process initiated in the 1980s has become established. In this sense, Spain has turned into one of the most decentralized countries in the world. The expenditures and revenues of the Spanish regional governments account for 17.7 and 16.6 percent of GDP in 2022, respectively.

In the European context, these figures are well above the corresponding averages of 6.1 and 6.0, respectively, for the twenty-seven countries of the European Union (EU-27). In a vis-à-vis comparison with the most decentralized countries in Europe, Spain remains at the top: Germany, Austria and Switzerland show shares of regional government in the revenues and expenditures of general governments lower than the Spanish ones.

In terms of financial imbalances of the regional governments, the Spanish records are also substantially higher than its counterparts in the EU-27. The public deficit at state level in Spain has achieved in 2022 the value of 1.1 percent of GDP, in contrast with the financial balance experienced by the regional governments of the EU-27 countries. In terms of regional government debt, the Spanish ACs have reached 23.6 percent of GDP in 2022, with Belgium in the second position with a percentage of 17.3.

These high levels of regional public debt have been persistent since the aftermath of the 2008 crisis. Indeed, until 2008, the borrowing of the Spanish ACs had never overcome the 7 percent of the GDP. However, it experienced an increasing trend since 2009 and its value has been around 25 percent of the GDP over the last ten years.

To complete this characterization of the Spanish regional debt, the decomposition of the factors driving its dynamics is offered next. We analyze which factors explain its recent evolution from 2015 to 2023. Similar exercises have been developed by Bank of Spain at country level (García-Moral and Laporta-Corbera, 2024) and the Spanish Independent Fiscal Institution ("Autoridad Independiente de Responsabilidad Fiscal", AIReF as known in Spanish) at regional level (AIReF, 2022). At this point, we go further with respect to previous analyses as long as a discussion on the deficit-debt adjustment is included here[4].

The analytical expression we have used is based on Escolano (2010):

$$b_t - b_{t-1} = \left(\frac{r_t}{1+g_t}\right) b_{t-1} - \left(\frac{\pi_t + g_t}{1+g_t}\right) b_{t-1} - p_t + ddа_t, \quad (1)$$

where $b$ is the stock of public debt as percentage of GDP, $r$ is the implicit nominal interest rate on debt[5], $g$ is the real GDP growth, $\pi$ inflation rate measured by the GDP deflator, $p$

[4] The deficit-debt adjustment measures the differences between the deficit and the change in public debt. These differences occur because the debt issues can finance the purchase of financial assets, and because the public debt and deficit are measured using a different valuation criterion as well.

[5] It is computed as the ratio of the interest expenditure and the average EDP public debt of year t (see next paragraphs for explanations on EDP), published by the Spanish Government Accountability Office ("Intervención General de la Administración del Estado", IGAE in Spanish, 2024) and Bank of Spain (BDE, 2024).

is the primary public balance, and *dda* are the deficit-debt adjustments as percentage of GDP. All variables are referring to year t or t-1.

The interpretation of the equation (1) is as follows. The change in the public debt to GDP ratio is explained, firstly, by the interest rates *r* to be paid for the previous stock of public debt; secondly, the inflation rate $\pi$, which reduces the indebtedness in real terms; and finally, the primary public balance (excluding the interest rates) *p*, that has a positive effect on the indebtedness. Moreover, the variables public debt and public balance must be connected using an accountant adjustment called the deficit-debt adjustment *dda*.

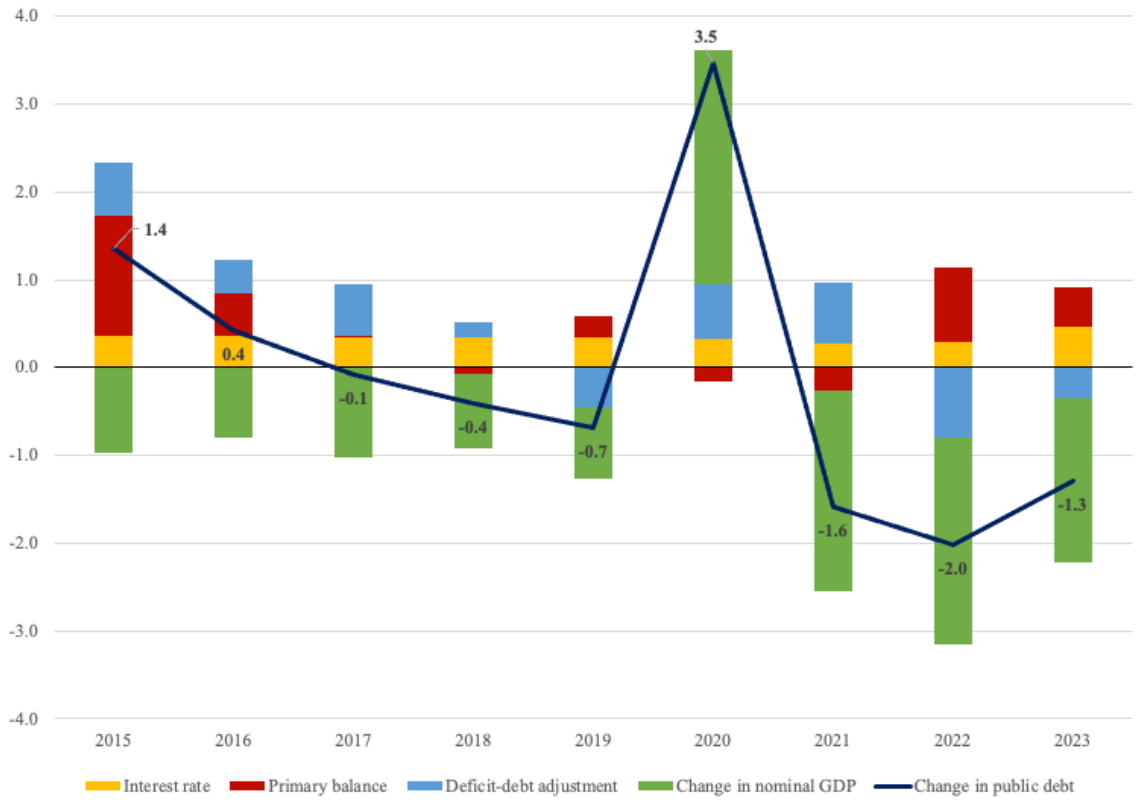
The so-called EDP (acronym of Excessive Deficit Procedure) public debt is defined following European rules and the concept is not the same as the financial liabilities issued by the public administration. In this sense, three adjustments are needed: i) The EDP public debt is accounted using its nominal value whereas the financial liabilities are valued using the market value. ii) The commercial debt is not included into the concept of EDP public debt; however, the factoring without recourse is considered as public debt according to EDP. And iii), the financial liabilities of other public administrations must be discounted from the EDP public debt at national level.

The disaggregation of the change in public debt for the state government sector is shown in the Graph 1. Following the equation (1), the change in public debt is decomposed into interest rate $\left(\frac{r_t}{1+g_t}\right) b_{t-1}$, primary balance $(-p_t)$ , nominal GDP growth $[-\left(\frac{\pi_t+g_t}{1+g_t}\right) b_{t-1}]$ and deficit-debt adjustment $dda_t$.

Before the pandemic, the reduction in public debt over GDP takes place from the years 2017 to 2019. This decrease is explained by the reduction of primary deficit, which presented a slightly surplus in the year 2018. It is important to highlight that the deficit-debt adjustment contributed to increase the public debt over these years. This is explained by the purchase of financial assets and the payment of commercial debts with financial institutions though factoring operations. The year 2019, in turn, is characterized by the negative deficit-debt adjustment coming from the sale of financial assets.

In 2020, the regional public debt increased by 3.5 percentage points (pp) of GDP. This is explained, mainly, by the drop in the GDP growth. From 2021 to 2023, the public debt decreased by more than 1 pp each year, mainly as result of GDP growth. The deficit-debt adjustment augmented the public debt in 2020 and 2021 but reduced in 2022 and 2023. Moreover, it is important to notice that the primary balance in 2020 and 2021 have recorded surpluses, which has contributed to reduce the public debt. Nevertheless, the primary balance worsens in 2022 and 2023, with the subsequent negative impact on public debt. Additionally, in 2023, a rise in the interest payments from 0.3 to 0.5 pp of GDP is observed, in line with the effects of tightening the monetary policy.

**Graph 1. Factors driving Spanish public debt at regional level, % GDP. 2015-2023**




Sources: BDE (2024), IGAE (2024), INE (2024) and own elaboration.

It is relevant to consider here the differential (and relatively volatile) pattern with respect to previous years of the regional deficit-debt adjustments. Table 1 presents the disaggregation of this adjustment from 2015 to 2023. The deficit-debt adjustment can be divided into three categories: net purchases of financial assets, other accounts payable (commercial credits receivable and other accounts payable), and other adjustments (mainly valuation adjustments). Other accounts payable includes the accounts payable vis-à-vis other general government units and/or referring to changes in commercial debts through the operation of factoring without recourse. The other adjustments include the effects produced by the reclassification of some institutional units as public administration, adjustments for accrual interest but not paid, adjustments for issuance premium, and so on.

The positive deficit-debt adjustment observed in 2020 and 2021 was caused by the regional excess liquidity that was materialized in the purchase of financial assets. Concretely, the regions purchased financial assets valued in €18,619 million in 2021. This number is almost tripled of the purchase observed in 2020 and it is also the highest of all the historical sequence. However, in the next year 2022, the deficit-debt adjustment was very negative (the biggest one in the series), which it is explained by the sale of the financial assets and

the reduction of other accounts payable against other government units. The deficit-debt adjustment in 2023 was also negative due to the reduction in other accounts payable.

All these changes in the impact of deficit-debt adjustments on public debt are sizeable enough to be not overlooked. Far from being residual, as the very name might express, they amount to significant records in absolute and relative terms. In a sense, these remarkable adjustments can indicate a flawed synchrony between the financial needs (or surpluses) of the Spanish regional governments and their liquidity management. In turn, two institutional features of the territorial financing system might be feeding up such event. One is given by the fact that a significant part of the regional revenues is provided by the central government to the regional ones in the form of down payments, which are confronted with the real ones two years later. This creates mismatches in cash and budget pressures that need to be adjusted with other financial arrangements.

The other is related to the performance of the extraordinary liquidity mechanism of the FFCCAA. Although in principle conceived as a temporary instrument, it has become permanent, providing a relatively comfortable source of resources to the regional governments. We guess therefore that some Spanish regional governments do not refuse the money they are entitled to receive, even though their financial needs are completely covered. Consequently, the excess of liquidity, formally generated by loans with the central government, turn into financial assets as happened in 2020 and 2021. This conjecture worths further research and here we only set up such hypothesis.

**Table 1. Disaggregation of the deficit-debt adjustment at regional level. 2015-2023. Millions of euros.**

| | Deficit-debt adjustment | Net purchases of financial assets | Other accounts payable | | Remainder adjustments |
|---|---|---|---|---|---|
| | | | vis-à-vis other general government units | other | |
| **2015** | 6,457 | 2,778 | 738 | 2,684 | 257 |
| **2016** | 4,245 | 811 | 788 | 2,295 | 351 |
| **2017** | 6,958 | 4,285 | 1,182 | 915 | 576 |
| **2018** | 1,991 | 2,228 | 970 | -1,251 | 44 |
| **2019** | -5,653 | -4,702 | 970 | -1,578 | -343 |
| **2020** | 6,928 | 6,468 | 970 | -917 | 407 |
| **2021** | 8,374 | 18,619 | -8,273 | -2,282 | 310 |
| **2022** | -10,640 | -5,047 | -5,639 | 117 | -71 |
| **2023** | -5,109 | 1,804 | -246 | -6,293 | -374 |

Source: BDE (2024) and own elaboration

The decomposition of the change in public debt to GDP ratio across regions, according to equation (1), from 2015 to 2023 is shown in Table 2. On average from 2016-2019, most of the regions reduced their public debt to GDP ratio and only six ACs increased it: Aragon, Asturias, Cantabria, Castile and Leon, Extremadura, and Murcia.

In 2020, the increment of public debt was greater in the regions with a greater drop in GDP growth. The most affected regions were Balearic Islands and Community of Valencia, which presented an increase in public debt of 8.7 pp and 6.6 pp and a drop in the impact of

GDP growth on debt of 7.7 pp and 4.3 pp, respectively. The regional primary balance was a surplus for the whole, helping to reduce the public debt. Only four regions closed with primary deficits: Community of Valencia, Murcia, Navarre, and Basque Country.

In 2021, the public debt to GDP ratio decreased in all regions. This is explained by the higher nominal GDP growth and again the surplus of the regional primary public balance. Only the Community of Valencia and Murcia presented primary deficits. It is important to notice that the primary surplus observed in 2020 and 2021 is explained by the huge financial assistance provided by the central government during the pandemic[6].

[6] De la Fuente (2024) describes in detail the financial assistance received by the regions in the latest years.

**Table 2. The evolution and factors determining the public debt across regions, % GDP**

| | Change in public debt | | | | Interest rate | | | | Primary balance | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Average 2016-2019 | 2020 | 2021 | 2022-2023 | Average 2016-2019 | 2020 | 2021 | 2022-2023 | Average 2016-2019 | 2020 | 2021 | 2022-2023 |
| All regions | -0.2 | 3.5 | -1.6 | -1.7 | 0.4 | 0.3 | 0.3 | 0.4 | -0.2 | 0.2 | 0.3 | -0.7 |
| Andalusia | -0.1 | 2.8 | -1.5 | -1.5 | 0.3 | 0.2 | 0.2 | 0.3 | -0.2 | 0.3 | 0.1 | -0.7 |
| Aragon | 0.2 | 2.7 | -0.9 | -1.6 | 0.4 | 0.4 | 0.3 | 0.4 | -0.5 | 0.7 | 0.2 | -0.4 |
| Asturias | 0.1 | 2.5 | -2.3 | -1.6 | 0.2 | 0.2 | 0.1 | 0.4 | -0.2 | 1.3 | 1.2 | 0.2 |
| Balearic Islands | -0.8 | 8.7 | -4.8 | -4.0 | 0.4 | 0.3 | 0.2 | 0.4 | 0.1 | 0.5 | 1.3 | 0.6 |
| Canary Islands | -0.6 | 2.6 | -1.6 | -1.5 | 0.2 | 0.1 | 0.1 | 0.3 | 0.9 | 0.6 | 0.6 | -0.2 |
| Cantabria | 0.2 | 3.5 | -1.6 | -2.1 | 0.3 | 0.3 | 0.2 | 0.3 | -0.5 | 0.6 | 1.1 | 0.0 |
| Castile-La Mancha | -0.2 | 3.7 | -2.8 | -2.1 | 0.4 | 0.4 | 0.2 | 0.4 | -0.3 | 1.0 | 0.5 | -1.2 |
| Castile and Leon | 0.3 | 2.7 | -1.3 | -1.1 | 0.3 | 0.3 | 0.3 | 0.4 | -0.4 | 0.9 | 0.1 | -0.5 |
| Catalonia | -0.6 | 4.2 | -1.9 | -2.2 | 0.5 | 0.5 | 0.4 | 0.5 | -0.1 | 0.0 | 0.1 | -0.9 |
| Extremadura | 0.8 | 2.9 | -1.6 | -1.2 | 0.3 | 0.3 | 0.2 | 0.4 | -0.6 | 0.0 | 0.4 | -0.8 |
| Galicia | -0.2 | 2.0 | -1.3 | -1.1 | 0.3 | 0.2 | 0.1 | 0.3 | 0.0 | 0.1 | 0.0 | -0.1 |
| Madrid | -0.1 | 2.0 | -1.3 | -1.0 | 0.3 | 0.3 | 0.3 | 0.4 | -0.1 | 0.3 | 0.6 | -0.3 |
| Murcia | 0.7 | 4.6 | -0.7 | -1.1 | 0.4 | 0.4 | 0.3 | 0.4 | -1.2 | -0.6 | -1.2 | -2.3 |
| Navarre | -0.6 | 3.3 | -3.8 | -1.5 | 0.4 | 0.3 | 0.3 | 0.3 | 0.8 | -0.6 | 1.6 | 1.7 |
| La Rioja | 0.0 | 2.2 | -1.2 | -1.6 | 0.1 | 0.1 | 0.0 | 0.1 | -0.3 | 1.3 | 0.0 | -0.5 |
| Community of Valencia | 0.0 | 6.6 | -1.6 | -2.3 | 0.4 | 0.4 | 0.3 | 0.5 | -1.0 | -0.7 | -0.7 | -2.3 |
| Basque Country | -0.5 | 3.5 | -0.8 | -1.5 | 0.2 | 0.2 | 0.2 | 0.3 | 0.7 | -0.5 | 1.2 | 0.2 |

Sources: BDE (2024), IGAE (2024), INE (2024) and own elaboration.

**Cont. Table 2. The evolution and factors determining the public debt across regions, % GDP**

| | Deficit-debt adjustment | | | | Change in nominal GDP | | | |
|---|---|---|---|---|---|---|---|---|
| | Average 2016-2019 | 2020 | 2021 | 2022-2023 | Average 2016-2019 | 2020 | 2021 | 2022-2023 |
| All regions | 0.2 | 0.5 | 0.6 | -0.6 | 0.7 | -2.3 | 2.1 | 2.0 |
| Andalusia | 0.2 | 0.6 | 0.7 | -0.6 | 0.9 | -2.7 | 2.3 | 2.1 |
| Aragon | 0.1 | 1.5 | 0.7 | -0.7 | 0.8 | -1.6 | 1.9 | 1.7 |
| Asturias | 0.2 | 1.5 | 0.7 | -0.4 | 0.5 | -2.1 | 2.2 | 1.3 |
| Balearic Islands | 0.1 | 1.2 | 0.6 | -0.3 | 1.3 | -7.7 | 5.1 | 3.2 |
| Canary Islands | 0.8 | 0.0 | 0.5 | -0.4 | 0.6 | -3.1 | 1.8 | 1.5 |
| Cantabria | 0.2 | 1.6 | 1.4 | -0.6 | 0.8 | -2.3 | 2.2 | 1.8 |
| Castile-La Mancha | 0.2 | 1.6 | 0.6 | -0.9 | 1.2 | -2.7 | 3.1 | 2.7 |
| Castile and Leon | 0.1 | 1.4 | 0.4 | -0.4 | 0.6 | -1.9 | 1.6 | 1.7 |
| Catalonia | 0.1 | -0.3 | 0.9 | -0.7 | 1.3 | -4.0 | 3.2 | 2.9 |
| Extremadura | 0.5 | 0.7 | 1.0 | -0.6 | 0.7 | -1.9 | 1.9 | 2.0 |
| Galicia | 0.1 | 0.3 | 0.1 | 0.0 | 0.6 | -1.7 | 1.6 | 1.4 |
| Madrid | 0.1 | 0.5 | 0.2 | -0.4 | 0.6 | -1.5 | 1.3 | 1.2 |
| Murcia | 0.0 | 1.1 | 0.9 | -1.1 | 0.9 | -2.6 | 3.0 | 2.7 |
| Navarre | 0.3 | 0.8 | -1.0 | 1.0 | 0.6 | -1.6 | 1.6 | 1.1 |
| La Rioja | 0.1 | 1.7 | 0.0 | -0.7 | 0.5 | -1.6 | 1.4 | 1.4 |
| Community of Valencia | 0.1 | 1.2 | 1.6 | -1.2 | 1.5 | -4.3 | 3.9 | 4.0 |
| Basque Country | 0.5 | 1.3 | 1.6 | -0.4 | 0.5 | -1.5 | 1.4 | 1.1 |

Sources: BDE (2024), IGAE (2024), INE (2024) and own elaboration.

In 2022-2023, the public debt in terms of GDP has decreased in all regions due to the GDP growth and the negative deficit-debt adjustment, except for Navarre which presented a high positive adjustment. The primary balance returned to deficit for most of the regions. Notwithstanding this, the governments of Asturias, Balearic Islands, Navarre, and Basque Country closed on average 2022-2023 with a primary surplus. Finally, the interest payments increased in these two years in all the regions.

# 3. Fiscal effort to reach a determined level of public debt

In this section, we address the following question: which fiscal consolidation effort is necessary to reduce the public debt to GDP ratio by a determined amount? Starting from the public debt to GDP ratios in 2023, the fiscal consolidation effort is defined in terms of the primary budget balance. And the determined amount as the regional objective established in LOEPSF, namely, 13 percent of GDP.

Our theoretical framework is based on Escolano (2010), with the following dynamic equation for public debt:

$$b_t = (1 + \lambda_t) b_{t-1} - p_t, \tag{2}$$

where $b_t$ is the debt to GDP ratio defined in (1), $\lambda_t = \frac{r_t - \gamma_t}{1+\gamma_t}$, measures the relation between implicit nominal interest rate ($r_t$) and the nominal growth of GDP ($\gamma_t$), and $p_t$ is the primary fiscal balance. This equation in differences is a reformulation of the expression (1) with the following solution in the year *N*:

$$b_N = b_0 \prod_{t=1}^{N} (1 + \lambda_t) - \sum_{t=1}^{N} \left[ \prod_{i=1+t}^{N} (1 + \lambda_i) \right] p_t. \tag{3}$$

Suppose that $\lambda_t = \lambda$ . Then the following expression is derived:

$$b_N = b_0 (1 + \lambda)^N - \textstyle\sum_{t=1}^{N} (1 + \lambda)^{N-t} \, p_t. \tag{4}$$

Finally, solving for $p_t$, the primary public balance needed ($p^*$) to reach a determined debt objective ($d_N^*$), starting with an initial ratio ($d_0$) and over a period of *N* years, is:

$$p^* = \frac{\lambda}{(1+\lambda)^{-N} - 1} \left( (1 + \lambda)^{-N} d_N^* - d_0 \right). \tag{5}$$

The values chosen to simulate this equation in the baseline scenario are the following. The nominal GDP growth rates are the regional averages from 2001-2023. The implicit nominal interest rate is the average across regions from 2015 to 2023; this is computed as the ratio between the interest payments and the stock of public debt. The starting point of public debt $d_0$ is the public debt to GDP ratio in 2023, whose values are shown in Graph 2. According to this benchmark, we have classified the regions in four groups:

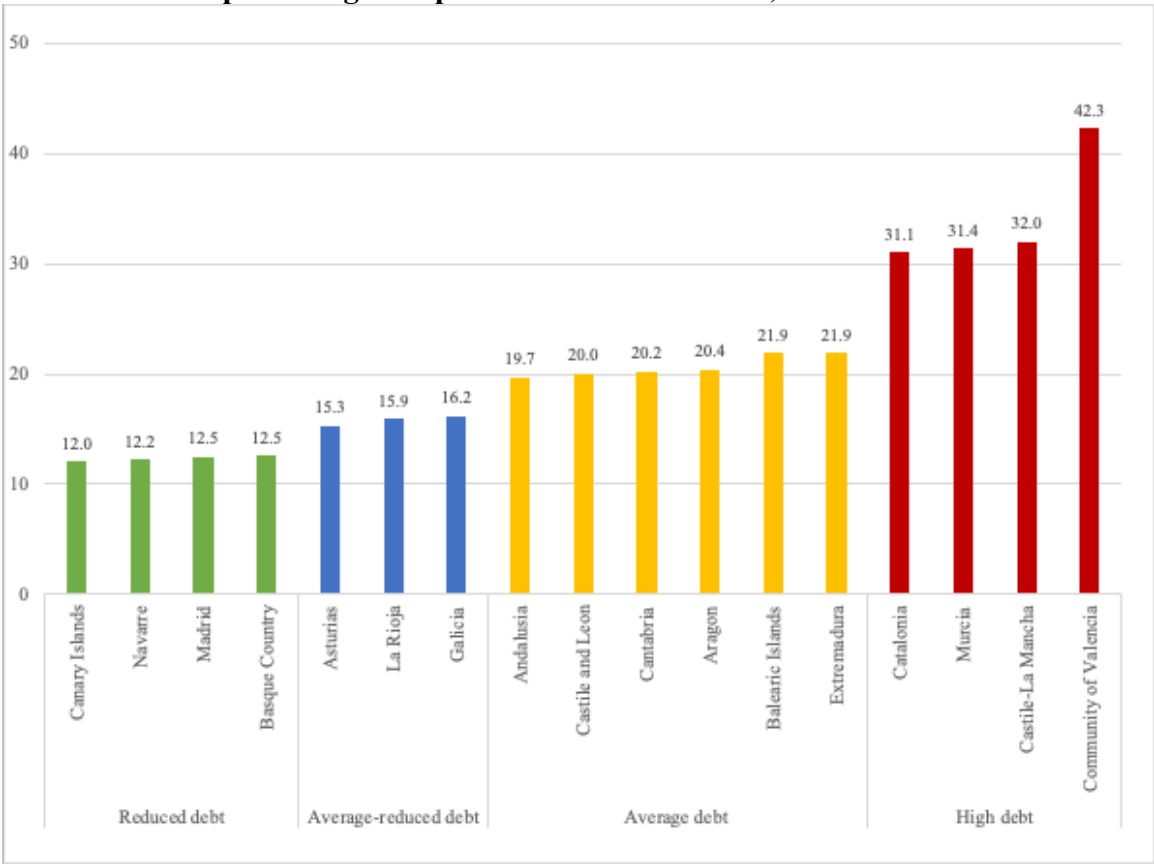
1. Regions with public debt below 13 percent: Canary Islands, Navarre, Madrid, and Basque Country.

2. Regions with public debt above 13 percent but below the average debt across regions (around 15-16 percent): Asturias, La Rioja, and Galicia.

3. Regions with public debt around the average across regions (20-22 percent): Andalusia, Castile and Leon, Cantabria, Aragon, Balearic Islands, and Extremadura.

4. Regions with high public debt (higher than 30 percent). Catalonia, Murcia, Castile-La Mancha, and Community of Valencia.

**Graph 2. Regional public debt ratio in 2023, % GDP**




Source: BDE (2024) and own elaboration.

Apart from the baseline scenario previously defined, two additional possible scenarios are considered. The first one is characterized by interest rates 50 percent higher than those in the baseline scenario. The second one also by an increment of interest rates by additional 50 percent from the first scenario and an increase of GDP growth rate by 50 percent from the baseline scenario. The first scenario reflects a more restrictive monetary policy than the one observed in the previous years. The second scenario combines this circumstance with higher inflation rates, which are compatible with higher nominal GDP growth rates.

In the following Tables 3 and 4 we have opted for ranking the regions by ascendent level of public debt over GDP. The parameters used in the simulation model according to the scenario considered are shown in Table 3. The parameter $\lambda$ is proportional to the difference between the implicit interest rate and the nominal GDP growth. As it is interpreted by equation (5), if the parameter $\lambda$ takes positive values, the unique manner to reduce the public debt ratio is with primary surplus. However, if the parameter $\lambda$ takes negative values and $(1+\lambda)^{-N} d_N^* - d_0 > 0$, it is possible to reduce the public debt to GDP ratio even with primary deficits. As it is shown in Table 3, under the baseline scenario the parameter $\lambda$ is negative, that is, the economic situation is favorable to reduce debt even with primary deficit. Notwithstanding, under the scenarios with augmented interest rates or with the augmented interest rates and nominal GDP growth, the parameter $\lambda$ becomes positive for Navarre.

It is important to highlight that according to the data shown in Table 3, despite the heterogeneity observed across regions, the interest rates do not reflect the fiscal situation and public finance sustainability of each region. For instance, the Community of Valencia closed 2023 with a debt level of 42.3 percent of GDP and presents an interest rate of 0.9 percent. However, the regions with the highest interest rates belong to the group of reduced level. These regions are Madrid and Navarre and they have an implicit interest rate of 2.4 percent and 2.5 percent, respectively. This is explained by the financial assistance received from the central government, which is provoking that the regions with high levels of debt present financial expenses near to zero. However, the regions with lower levels of debt opted for obtaining the funds in the capital markets and without recurring to financial assistance.

**Table 3. Parameters used in the simulation of the budgetary effort for the Spanish general and the regional governments.**

| | Base scenario | | | Augmented interest rates (*) | | | Augmented interest rates and nominal GDP growth (*) | | |
|---|---|---|---|---|---|---|---|---|---|
| | Nominal GDP growth (%) 2001-2023 | Interest rate (%) 2015-2023 | $\lambda$ | Nominal GDP growth (%) 2001-2023 | Interest rate (%) 2015-2023 | $\lambda$ | Nominal GDP growth (%) 2001-2023 | Interest rate (%) 2015-2023 | $\lambda$ |
| **Total regions** | **3.7** | **1.4** | **-2.2** | **3.7** | **2.1** | **-1.5** | **5.6** | **3.2** | **-2.2** |
| Canary Islands | 3.4 | 1.3 | -2.1 | 3.4 | 1.9 | -1.5 | 5.2 | 2.8 | -2.2 |
| Navarre | 3.5 | 2.5 | -1.0 | 3.5 | 3.8 | 0.2 | 5.3 | 5.7 | 0.4 |
| Madrid | 4.2 | 2.4 | -1.7 | 4.2 | 3.6 | -0.6 | 6.3 | 5.3 | -0.9 |
| Basque Country | 3.4 | 1.6 | -1.7 | 3.4 | 2.5 | -0.9 | 5.0 | 3.7 | -1.3 |
| Asturias | 3.1 | 1.3 | -1.7 | 3.1 | 2.0 | -1.0 | 4.6 | 3.0 | -1.5 |
| La Rioja | 3.3 | 0.4 | -2.8 | 3.3 | 0.6 | -2.6 | 5.0 | 0.9 | -3.9 |
| Galicia | 3.7 | 1.6 | -2.0 | 3.7 | 2.4 | -1.3 | 5.5 | 3.5 | -1.9 |
| Andalusia | 3.8 | 1.2 | -2.5 | 3.8 | 1.8 | -1.9 | 5.6 | 2.7 | -2.8 |
| Castile and Leon | 3.0 | 1.7 | -1.3 | 3.0 | 2.6 | -0.4 | 4.5 | 3.9 | -0.6 |
| Cantabria | 3.3 | 1.3 | -2.0 | 3.3 | 1.9 | -1.4 | 5.0 | 2.8 | -2.0 |
| Aragon | 3.7 | 1.8 | -1.8 | 3.7 | 2.7 | -0.9 | 5.5 | 4.1 | -1.3 |
| Balearic Islands | 4.1 | 1.3 | -2.7 | 4.1 | 2.0 | -2.1 | 6.2 | 3.0 | -3.0 |
| Extremadura | 3.7 | 1.6 | -2.1 | 3.7 | 2.3 | -1.3 | 5.6 | 3.5 | -1.9 |
| Catalonia | 3.7 | 1.4 | -2.2 | 3.7 | 2.1 | -1.6 | 5.6 | 3.2 | -2.3 |
| Murcia | 4.1 | 1.3 | -2.8 | 4.1 | 1.9 | -2.2 | 6.2 | 2.8 | -3.2 |
| Castile-La Mancha | 3.9 | 1.1 | -2.6 | 3.9 | 1.7 | -2.1 | 5.8 | 2.5 | -3.1 |
| Community of Valencia | 3.6 | 0.9 | -2.6 | 3.6 | 1.4 | -2.1 | 5.4 | 2.1 | -3.2 |

(*) The scenario with augmented interest rates is that in which these have been multiplied by 1.5. The scenario with augmented interest rates and nominal GDP growth is that in which the former have been multiplied by 2.25 and the latter by 1.5.

Table 4 shows the fiscal consolidation efforts required by each region to reach a public debt objective of 13% GDP. Each scenario is considered under three different time horizons (5, 10 and 20 years). The regions are ordered from the lowest to highest levels of public debt. The main difference here among regions is explained by the different starting point in debt. The regions with lower levels of debt (Canary Islands, Navarre, Madrid, and Basque Country) can maintain the debt objective of 13 percent of GDP even with primary deficits in the baseline scenario and in the other two as well, and even in short period of time (5 years). This occurs because these regions already closed 2023 with a debt level below the objective.

The regions belonging to the group of below-average debt can reach the debt objective if they keep a balanced annual primary balance for 10 or 20 years or keep a surplus of 0.2-0.3 percent of GDP for first 5 years. The regions in the group with debt ratio around the average should keep a balanced primary balance for 20 years under the base scenario to reach the debt objective level. Finally, the regions with higher public debt levels (Catalonia, Murcia, Castile-La Mancha, and Community of Valencia) should do a costly fiscal consolidation effort to reach the debt objective of 13 percent in 10 or 20 years. The primary surplus should be 0.3-0.4 percent for 20 years under the baseline scenario. The Community of Valencia, the region with the highest debt level (42.3 percent), should keep a surplus of 0.8 percent for 20 years to reach the debt level of 13 percent of GDP.

The last two columns of Table 4 show the historical average primary balances achieved by the ACs over two periods: the longest one starting at the beginning of 21$^{st}$ century and the most recent over the last decade, both finishing just before the pandemic in order to avoid the turbulences of such as years. Only the first group of regions present positive or slightly negative records for primary balances. The three remaining groups show a historical fiscal behavior far away from the requirements of fiscal consolidation derived from our exercise.

In the case of the regional governments with high public debt to GDP ratios (Catalonia, Murcia, and Community of Valencia), the usual primary deficits have been placed around 1 percent of GDP, while our results suggest that such as governments should register primary surpluses, in many cases of remarkable size and over several years, to fulfill the objective of 13 percent of public debt over GDP. Clearly, this debt benchmark is unfeasible and, consequently, lacks credibility.

## Table 4. Regional primary balance needed to reach the public debt objective of 13% of GDP

| | Base scenario | | | Augmented interest rates (*) | | | Augmented interest rates and nominal GDP growth (*) | | | Historical primary balances | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 2028 | 2033 | 2043 | 2028 | 2033 | 2043 | 2028 | 2033 | 2043 | 2000-2019 | 2012-2019 |
| **Total regions** | **1.4** | **0.5** | **0.1** | **1.6** | **0.7** | **0.2** | **1.4** | **0.5** | **0.1** | **-0.9** | **-0.7** |
| Canary Islands | -0.5 | -0.4 | -0.3 | -0.4 | -0.3 | -0.2 | -0.5 | -0.4 | -0.3 | -0.4 | 0.1 |
| Navarre | -0.3 | -0.2 | -0.2 | -0.1 | 0.0 | 0.0 | -0.1 | 0.0 | 0.0 | -0.3 | 0.0 |
| Madrid | -0.3 | -0.3 | -0.2 | -0.2 | -0.1 | -0.1 | -0.2 | -0.2 | -0.1 | -0.5 | -0.4 |
| Basque Country | -0.3 | -0.3 | -0.2 | -0.2 | -0.2 | -0.1 | -0.3 | -0.2 | -0.2 | -0.3 | 0.0 |
| Asturias | 0.2 | 0.0 | -0.1 | 0.3 | 0.1 | 0.0 | 0.2 | 0.0 | -0.1 | -0.8 | -0.5 |
| La Rioja | 0.2 | -0.1 | -0.3 | 0.2 | -0.1 | -0.2 | 0.0 | -0.3 | -0.4 | -0.9 | -0.6 |
| Galicia | 0.3 | 0.0 | -0.1 | 0.4 | 0.1 | 0.0 | 0.4 | 0.0 | -0.1 | -0.5 | -0.2 |
| Andalusia | 0.9 | 0.3 | -0.1 | 1.0 | 0.4 | 0.0 | 0.9 | 0.2 | -0.1 | -0.7 | -0.7 |
| Castile and Leon | 1.2 | 0.5 | 0.1 | 1.3 | 0.6 | 0.3 | 1.3 | 0.6 | 0.2 | -0.8 | -0.6 |
| Cantabria | 1.1 | 0.4 | 0.0 | 1.2 | 0.5 | 0.1 | 1.1 | 0.4 | 0.0 | -1.0 | -0.8 |
| Aragon | 1.2 | 0.4 | 0.1 | 1.3 | 0.6 | 0.2 | 1.3 | 0.5 | 0.2 | -0.9 | -0.9 |
| Balearic Islands | 1.3 | 0.4 | 0.0 | 1.4 | 0.5 | 0.1 | 1.2 | 0.4 | -0.1 | -1.4 | -0.5 |
| Extremadura | 1.4 | 0.5 | 0.1 | 1.5 | 0.7 | 0.2 | 1.4 | 0.5 | 0.1 | -0.9 | -1.0 |
| Catalonia | 3.1 | 1.3 | 0.4 | 3.2 | 1.5 | 0.6 | 3.1 | 1.3 | 0.4 | -1.1 | -0.9 |
| Murcia | 3.0 | 1.2 | 0.3 | 3.2 | 1.3 | 0.4 | 2.9 | 1.1 | 0.2 | -1.5 | -1.7 |
| Castile-La Mancha | 3.2 | 1.3 | 0.4 | 3.3 | 1.4 | 0.5 | 3.1 | 1.2 | 0.3 | -1.6 | -0.6 |
| Community of Valencia | 5.1 | 2.2 | 0.8 | 5.2 | 2.3 | 0.9 | 4.9 | 2.0 | 0.6 | -1.7 | -1.5 |

(*) The scenario with augmented interest rates is that in which these have been multiplied by 1.5. The scenario with augmented interest rates and nominal GDP growth is that in which the former have been multiplied by 2.25 and the latter by 1.5.

# 4. Future evolution of public debt: some foreseeable scenarios

In this section, a forecasting exercise is carried out to simulate the expected path for the public debt to GDP ratio under some fiscal consolidation strategies, which are measured in terms of structural fiscal balance. Particularly, a model is developed to simulate the evolution of public debt jointly with other macroeconomic variables, like the GDP growth or the cyclical budget balance, among others. This new approach is an extension of the model developed in the previous section. While the previous results are derived from the dynamic equation of public debt, now we study how the variables involved in these dynamics are in turn affected by the fiscal consolidation strategies at play.

We follow here the model presented by Warmedinger *et al.* (2015). This model uses structural equations to measure the relationships among the relevant variables. Hernández de Cos *et al.* (2018) calibrate this model for the Spanish economy. Our contribution here is the recalibration of the parameters to allow its extension at regional level.

The starting point is the equation that relates the changes in the fiscal policy with its effect over the real GDP growth (Warmedinger *et al.*, 2015):

$$g_t = \rho g_{t-1} + (1-\rho)\bar{g}_{t-1} - \beta_1 \Delta d_t^E - \beta_2 O_t - \beta_3 (r_t - r_{t-1}), \quad (6)$$

where $g_t$ is the real GDP growth, which shows a persistence $\rho$ with respect to past values; $\bar{g}$ is the potential GDP growth in real terms, $\beta_1$ is the fiscal multiplier, $\Delta d_t^E$ is the change in the structural primary balance as percentage of GDP, $\beta_2$ is the sensitivity of the real GDP growth to the closeness of the *output gap* $O_t$, and $\beta_3$ is the sensitivity of the real GDP growth to the interest rates, being $r$ the nominal interest rate.

According to the equation (6), the real GDP growth rate depends positively on its lag of growth rates and the growth rate of the potential GDP, and negatively on the reduction of the primary structural deficit, the output gap and the increment of the nominal interest rates. The public balance, measured as percentage of GDP, is turn defined as the sum of the cyclical and structural balances:

$$d_t \equiv d_t^E \left(\frac{\bar{Y}_t}{Y_t}\right) + d_t^C, \quad (7)$$

where $\bar{Y}_t$ is the level of potential GDP in nominal terms, $Y_t$ is the nominal GDP, and $d_t^C$ is the cyclical balance derived in the next equation (8) using the semi-elasticity $\epsilon$ and the *output gap* $O_t$:

$$d_t^C \equiv \epsilon O_t. \quad (8)$$

It is also necessary to set up an equation, similar to a Phillips curve in an extensive way, which relates the inflation rate to the cyclical situation of the economy, that is, the *output gap* and the inflation rate expectations. These expectations on inflation are defined using the past inflation rates and the European Central Bank (ECB) medium term objective ($\pi^0$):

$$\pi_t = \vartheta_0 \pi^0 + (1 - \vartheta_0)\, {}^1\!/_4\, (\pi_{t-1} + \pi_{t-2} + \pi_{t-3} + \pi_{t-4}) + \vartheta_1 O_t, \quad (9)$$

where $\pi_t$ is the inflation rate in *t*, $\vartheta_0$ measures how the ECB objective for inflation anchors the actual inflation rate, and $\vartheta_1$ is the inflation sensitivity to the *output gap* $O_t$.

Finally, the dynamic of interest rates depends on the hysteresis process given by the parameter $\varphi_r$ and the term that measures the decomposition of interest rates into long-term and short-term maturities of public debt. The resulting equation is as follows:

$$r_t = \varphi_r r_{t-1} + (1 - \varphi_r)\{(1 - \varphi_r^S) r_t^L + \varphi_r^S r_t^S\}, \quad (10)$$

where the superscripts *S* and *L* are referring to the short and long-term issues of public debt. The long-term interest rates $r_t^L$ also follow a hysteresis process affected by the situation of public finances, measured as the distance of the budget balance and the public debt to their benchmark values fixed by the fiscal rules, $\bar{d}_t$ and $\bar{b}_t$, respectively. For the regional governments, a public balance of $\bar{d}_t = 0\%$ and a public debt objective of $\bar{b}_t = 13\%$ have been set up, as ruled by the LOEPSF[7]:

$$r_t^L = r_{t-1}^L - \tau_d\big(d_{t-1} - \bar{d}_t\big) + \tau_b\big(b_{t-1} - \bar{b}_t\big). \quad (11)$$

The short-term interest rate has a dependency relationship with respect to the long-term, as it is shown in the following expression:

$$r_t^S = r_t^L + {}^1\!/_4 \sum_1^4 (r_{t-1}^S - r_{t-1}^L), \quad (12)$$

where a moving average of the difference between the short and long terms interest rates for the previous four years is computed. The interpretation is that an improvement in the public finances produces better finance conditions in the short and long term.

For the calibration of the model, we have followed again Warmedinger *et al.* (2015) and Hernández de Cos *et al.* (2018). The values proceed from the macroeconomic scenario of the Budgetary Plan 2024 (2023). However, some adjustments are done to approximate these values to the particular case of the Spanish regions according to the structural balances and semi-elasticities obtained in Díaz *et al*. (2023, 2024) and Marín (2020). At this point, this paper offers a novel application of original estimates of these public balances as, to the best of our knowledge, they are not usually considered at regional level.

Specifically, the parameters used in the simulation are the following, with a reminder of their meaning between parenthesis[8]:

$\rho = 0.5$ (persistence of the real GDP growth rates)
$\beta_1 = 0.55$ (fiscal multiplier)

[7] Strictly speaking, the LOEPSF establishes a public balance of 0% over the cycle, that is, in structural terms.
[8] A constellation of alternative parameters has been also used as sensitivity analysis, with the constraint of arriving at non-explosive dynamic paths in the relevant variables, and the results keep unchanged in essence. They are available upon request.

$\beta_2 = 0.2$ (closing of the output gap)
$\beta_3 = 0.5$ (elasticity of the change in rates on growth)
$\bar{g} = 1.5\%$ (potential GDP growth rate according to the Budgetary Plan 2024)
$\epsilon = 0.15$ (semi-elasticity of the public balance with respect to the output gap for each region, 0.15 is the average value for all the regions; these semi-elasticities are computed in Marín, 2020)
$\vartheta_0 = 0.3$ (anchoring of inflation to its medium-term objective) and
$\vartheta_1 = 0.1$ (inflation response to output gap)

The parameters used to determine the interest rates are in turn:

$\tau_d = 0.11$ (impact of a 1% of GDP increase in the deficit/GDP ratio on the long-term interest rates; this value has been reduced from 0.15 mentioned by the literature previously cited).
$\tau_b = 0.01$ (impact of 1% GDP increase in the public debt/GDP on the long-term interest rates; this value has been reduced from 0.02 mentioned by the literature).

Both parameters $\tau_d$ and $\tau_b$ have been reduced given the softening of the coming European fiscal rules with respect to the previous ones and the -still active- ECB purchase bond program.

$\varphi_r = 0.7$ (persistence of the implicit interest rate with respect to past values; it has been reduced by 20 basic points with respect to the value used in the literature. This can be explained by the recent changes in the monetary policy).
$\varphi_r^S = 0.2$ (weight of short-term debt to determine the interest rates).

The fiscal consolidation scenarios considered here, all of them over the period 2024-2034, are the following ones:

A) The fiscal consolidation effort is null, i. e., the structural balance is kept unchanged in each region and fixed at the value estimated for 2023. This scenario is called *conservative*.
B) The regions reduce yearly the structural deficit by 0.25 percent of GDP from 2023 to a superior limit of 0.75 percent of GDP in line with AIReF's assumptions (2022). This fiscal consolidation effort is done for a public debt above the objective of 13 percent of GDP. This scenario is called *reactive*.
C) A yearly fiscal consolidation effort which keeps the structural balance as the regional historical average from 2014 to 2023. This value is -0.49 percent of GDP.
D) A fiscal consolidation effort which keeps the structural balance equal to the specific region historical average from 2014 to 2023.

The scenarios conservative, C and D, which keep the (average and/or specific) structural balances, are relatively comfortable scenarios for the governments, given the previous experience. As previously claimed, the model also provides insights on the effects of fiscal policy over the economic activity, the cyclical balance, and the public debt ratio over GDP.

The simulation results are shown in the Graph 3 and the Tables 5, 6, 7 and 8. The Graph 3 depicts the simulated paths for public debt, public balance, cyclical balance, and real GDP growth for the regions as whole under the first two scenarios labeled as *conservative* and *reactive*. Tables 5, 6, 7 and 8 show the public debt to GDP ratio by each region under all the scenarios previously defined.

The public debt to GDP ratio of the Spanish regions is even expected to increase by 2.2 pp. of GDP (from 22.2 in 2024 to 24.4 percent in 2034) under the *conservative* scenario. No fiscal efforts by the regional governments lead to increases in their relative levels of public debts, yet assuming growth in potential GDP. However, this public debt ratio is reduced up to 15.1 percent of GDP under the *reactive* scenario. This level is still above the benchmark of 13 percent proposed in the LOEPSF but it is clear that just a continued fiscal consolidation process is able to modify substantially the expected path of public debt to GDP ratio.

The public deficit worsens by 3 tenths of GDP over the ten years period under the *conservative* scenario, increasing the public imbalance up to 1.2 percent of GDP. However, under the *reactive* scenario, the public balance will reach surplus since 2030. In both cases (reactive and conservative scenarios), the cyclical public balance is negative since 2026 onwards. This is due to the fact of facing real GDP growth below the potential GDP growth (1.5 percent), which is practically achieved at the end of the period under consideration.

The evolution of GDP growth clearly responds to the factors contained in equation (6). On the one hand, a contractionary fiscal policy involving decreases in the structural primary deficit negatively affects the GDP growth ($-\beta_1 \Delta d_t^E$). On the other hand, to keep unchanged the fiscal stance as the conservative scenario has assumed exerts a negative impact on the interest rates as the public deficit and debt ratios do not converge to the fixed benchmarks ($-\beta_3(r_t - r_{t-1})$), given the long-term interest rate equation (11).

The following results shown in the Tables 5, 6, 7 and 8 present the path of public debt to GDP ratio by each region under the scenarios A, B, C and D. This path is obviously affected by the initial level of debt in each region. As it was shown in the Graph 2, the regions start from heterogeneous debt to GDP ratios. The lowest regional public debt ratio in 2023 was 12 percent and the highest level was 42.3 percent.

The fiscal consolidation scenario A, named *conservative,* keeps unchanged the structural public balance estimated in 2023 along the whole period from 2024 to 2034. Two regions will substantially worsen their starting debt situation, Murcia, and Community of Valencia. Both will increase their public debt to GDP ratio in 10.4 and 13 pp, respectively, until the levels of 42.4 and 55.3 percent of GDP. By contrast, Basque Country, Navarre, Asturias, Balearic Islands, Canary Islands, Cantabria, Galicia and La Rioja will reduce their public debt ratio (all of these regions present structural surpluses in 2023.

The fiscal consolidation scenario B, *reactive,* involves the reduction of structural deficit by 0.25 percent of GDP each year. The highly indebted regions such as Community of Valencia and Murcia hardly improve the level of debt (between 1.8 and 4 points of GDP

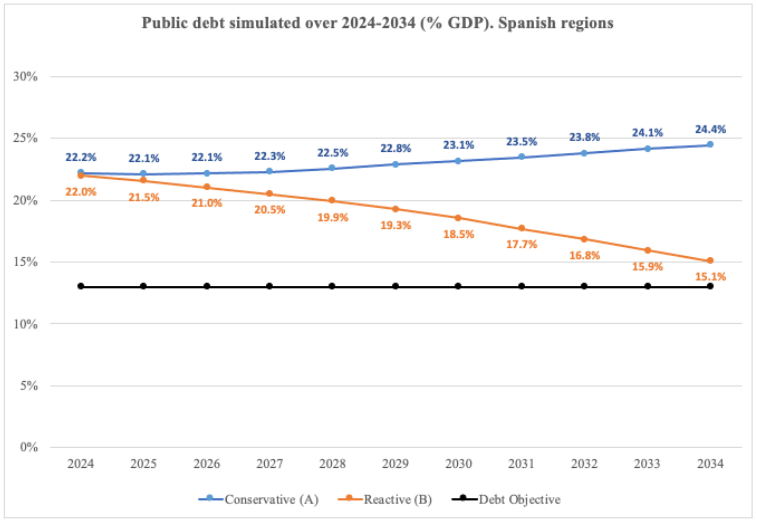
over the whole period), with public debt to GDP ratios far away from the normative 13 percent. The remaining regions obtain improvements of different proportion. Andalusia, Aragon, Asturias, Balearic Islands, Canary Islands, Cantabria, Castille and Leon, Galicia, La Rioja, Madrid, Navarre and Basque Country reach the public debt objective of 13 percent of GDP. Catalonia, Castille-La Mancha and Extremadura would be still above it.

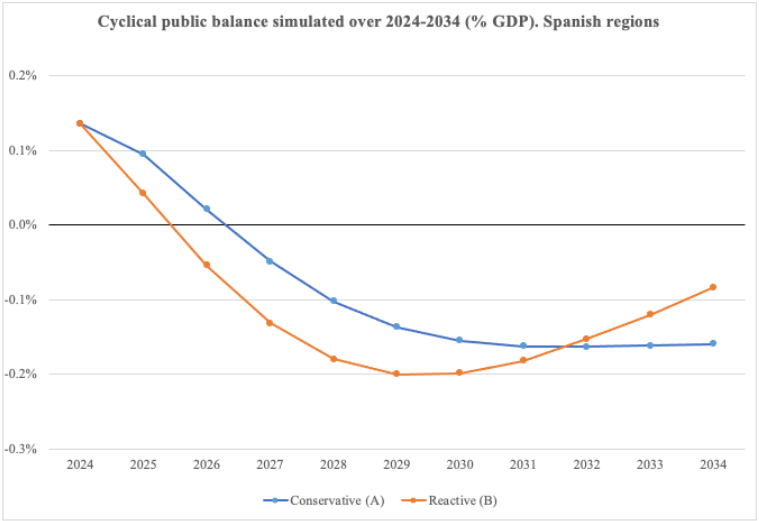
The scenarios C and D hardly reduce the levels of regional public debt as these scenarios keep unchanged the regional average and the specific-region average structural balance from 2014 to 2023. The regional public debt to GDP ratio is only reduced in 2.5 pp from 2024 to 2034 in both scenarios.

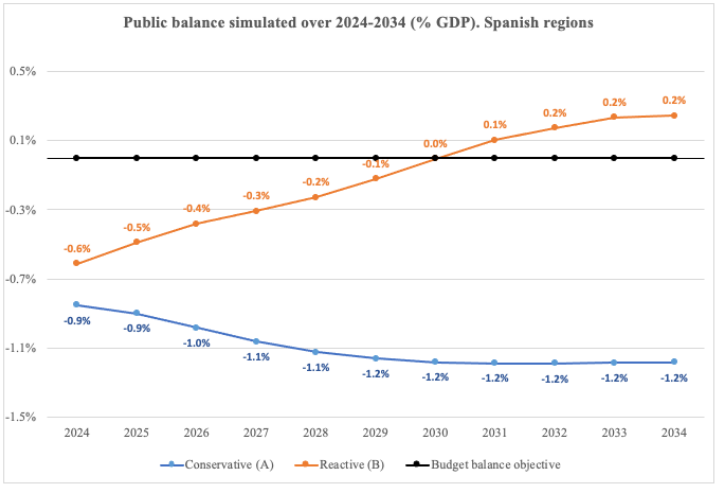
In the scenario C a reduction in the dispersion of the final values with respect to the initial ones is observed. The regions with relatively low levels of public debt keep these values at the end of the period (2034), while the regions with higher levels of public debt reduce them in a higher proportion than if their specific-historical fiscal behaviors were taken account (scenario D). This is the case of Murcia and Community of Valencia, whose public debt to GDP ratios show a difference of 4.4 and 7.2 pp, respectively, between the beginning and the end of period.

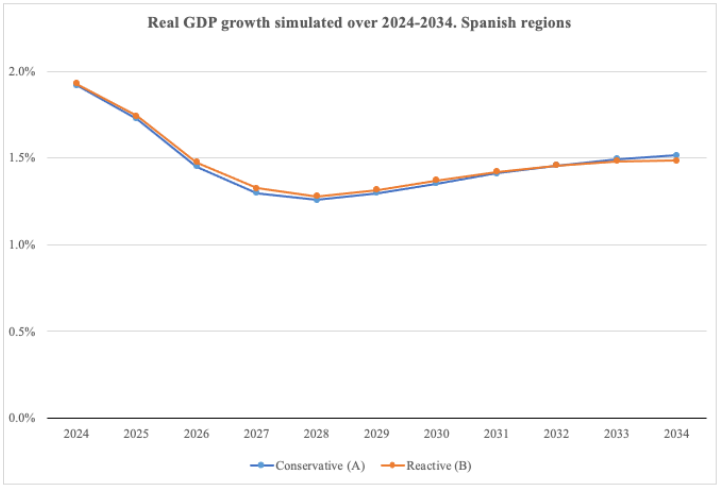
In contrast, the regions with initially reduced levels of public debt will keep these ratios during the following ten years when the average (for all regions) value of structural balances is considered. However, they present a greater reduction if they follow their own specific-historical fiscal stance. This is the case of Canary Islands, Navarre, and Basque Country under the scenario D, even with the former accumulating financial assets instead of liabilities as public debt.

**Graph 3. Evolution of regional public debt, budgetary balance, cyclical balance, and real GDP growth. 2024-2034**



| | Table 5. Public debt (% GDP). Scenario a) *Conservative* | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **2024** | **2025** | **2026** | **2027** | **2028** | **2029** | **2030** | **2031** | **2032** | **2033** | **2034** | **Variation rate 2034-2024** |
| Total Regions | 22.2 | 22.1 | 22.1 | 22.3 | 22.5 | 22.8 | 23.1 | 23.5 | 23.8 | 24.1 | 24.4 | 2.3 |
| Andalusia | 19.8 | 20.1 | 20.5 | 20.9 | 21.4 | 21.9 | 22.4 | 22.9 | 23.3 | 23.8 | 24.3 | 4.4 |
| Aragon | 20.4 | 20.8 | 21.1 | 21.4 | 21.7 | 21.9 | 22.2 | 22.4 | 22.7 | 23.0 | 23.3 | 2.9 |
| Asturias | 14.4 | 14.1 | 13.6 | 13.1 | 12.6 | 12.1 | 11.5 | 11.0 | 10.5 | 10.0 | 9.5 | -4.9 |
| Balearic Islands | 21.0 | 18.8 | 17.4 | 16.6 | 16.2 | 16.0 | 15.9 | 15.8 | 15.7 | 15.6 | 15.5 | -5.5 |
| Canary Islands | 11.4 | 9.5 | 8.2 | 7.3 | 6.8 | 6.5 | 6.4 | 6.3 | 6.3 | 6.2 | 6.1 | -5.3 |
| Cantabria | 19.5 | 19.4 | 19.2 | 18.9 | 18.7 | 18.4 | 18.1 | 17.7 | 17.3 | 17.0 | 16.6 | -2.9 |
| Castile-La Mancha | 31.4 | 31.9 | 32.0 | 32.1 | 32.0 | 31.9 | 31.8 | 31.8 | 31.8 | 31.8 | 31.9 | 0.5 |
| Castile and Leon | 19.9 | 20.3 | 20.6 | 20.8 | 21.0 | 21.2 | 21.3 | 21.5 | 21.7 | 21.9 | 22.1 | 2.2 |
| Catalonia | 31.0 | 30.9 | 31.0 | 31.3 | 31.7 | 32.1 | 32.6 | 33.1 | 33.5 | 34.0 | 34.5 | 3.5 |
| Extremadura | 21.8 | 22.9 | 23.7 | 24.3 | 24.7 | 25.0 | 25.2 | 25.5 | 25.8 | 26.1 | 26.4 | 4.7 |
| Galicia | 15.5 | 15.2 | 14.9 | 14.5 | 14.2 | 13.8 | 13.4 | 13.0 | 12.6 | 12.3 | 11.9 | -3.5 |
| La Rioja | 15.5 | 15.4 | 15.2 | 15.1 | 15.0 | 14.9 | 14.7 | 14.5 | 14.3 | 14.1 | 13.9 | -1.6 |
| Madrid | 12.5 | 12.1 | 11.9 | 11.9 | 12.0 | 12.1 | 12.3 | 12.6 | 12.8 | 13.0 | 13.2 | 0.8 |
| Murcia | 32.0 | 32.8 | 33.6 | 34.6 | 35.6 | 36.7 | 37.8 | 38.9 | 40.0 | 41.2 | 42.4 | 10.4 |
| Navarre | 10.4 | 9.0 | 7.9 | 7.1 | 6.6 | 6.1 | 5.7 | 5.4 | 5.1 | 4.8 | 4.6 | -5.9 |
| Basque Country | 12.1 | 11.9 | 11.6 | 11.4 | 11.3 | 11.2 | 11.1 | 11.0 | 10.9 | 10.8 | 10.7 | -1.4 |
| Community of Valencia | 42.3 | 43.2 | 44.2 | 45.2 | 46.5 | 47.8 | 49.2 | 50.6 | 52.1 | 53.7 | 55.3 | 13.0 |

| | Table 6. Public debt (% GDP). Scenario b) *Reactive* | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **2024** | **2025** | **2026** | **2027** | **2028** | **2029** | **2030** | **2031** | **2032** | **2033** | **2034** | **Variation rate 2034-2024** |
| Total Regions | 22.0 | 21.5 | 21.0 | 20.5 | 19.9 | 19.3 | 18.5 | 17.7 | 16.8 | 15.9 | 15.1 | -6.9 |
| Andalusia | 19.6 | 19.5 | 19.3 | 18.9 | 18.4 | 17.6 | 16.6 | 15.4 | 14.2 | 13.0 | 12.0 | -7.6 |
| Aragon | 20.2 | 20.2 | 19.9 | 19.3 | 18.5 | 17.5 | 16.2 | 15.0 | 13.7 | 12.4 | 11.4 | -8.7 |
| Asturias | 14.2 | 13.4 | 12.4 | 11.6 | 10.9 | 10.4 | 9.9 | 9.4 | 8.9 | 8.5 | 8.1 | -6.1 |
| Balearic Islands | 20.8 | 18.3 | 16.3 | 14.7 | 13.3 | 12.0 | 11.0 | 10.4 | 9.9 | 9.4 | 9.0 | -11.8 |
| Canary Islands | 11.2 | 9.3 | 7.8 | 6.7 | 6.1 | 5.6 | 5.3 | 5.1 | 4.9 | 4.7 | 4.5 | -6.7 |
| Cantabria | 19.3 | 18.8 | 18.0 | 17.0 | 15.9 | 14.8 | 13.6 | 12.5 | 11.5 | 10.7 | 10.1 | -9.2 |
| Castile-La Mancha | 31.2 | 31.3 | 30.9 | 30.0 | 29.0 | 27.6 | 26.1 | 24.5 | 23.0 | 21.4 | 19.9 | -11.3 |
| Castile and Leon | 19.7 | 19.7 | 19.4 | 18.8 | 17.9 | 16.8 | 15.5 | 14.3 | 13.0 | 11.8 | 10.8 | -8.9 |
| Catalonia | 30.8 | 30.4 | 29.9 | 29.3 | 28.6 | 27.8 | 26.7 | 25.3 | 23.9 | 22.4 | 20.9 | -9.8 |
| Extremadura | 21.5 | 22.3 | 22.5 | 22.3 | 21.7 | 20.8 | 19.6 | 18.3 | 17.0 | 15.7 | 14.4 | -7.2 |
| Galicia | 15.2 | 14.6 | 13.6 | 12.6 | 11.7 | 11.0 | 10.5 | 10.0 | 9.5 | 9.1 | 8.7 | -6.6 |
| La Rioja | 15.3 | 14.7 | 14.0 | 13.0 | 12.0 | 11.2 | 10.6 | 10.1 | 9.7 | 9.3 | 8.8 | -6.4 |
| Madrid | 12.2 | 11.5 | 10.7 | 10.1 | 9.6 | 9.2 | 8.8 | 8.4 | 8.1 | 7.7 | 7.4 | -4.8 |
| Murcia | 31.8 | 32.2 | 32.5 | 32.6 | 32.7 | 32.4 | 32.0 | 31.3 | 30.4 | 29.2 | 27.8 | -4.0 |
| Navarre | 10.4 | 9.0 | 7.9 | 7.1 | 6.6 | 6.1 | 5.7 | 5.4 | 5.1 | 4.8 | 4.6 | -5.9 |
| Basque Country | 11.9 | 11.4 | 10.9 | 10.5 | 10.2 | 9.8 | 9.4 | 9.1 | 8.7 | 8.4 | 8.0 | -3.9 |
| Community of Valencia | 42.1 | 42.7 | 43.1 | 43.3 | 43.5 | 43.6 | 43.3 | 42.9 | 42.3 | 41.4 | 40.3 | -1.8 |

| Table 7. Public debt (% GDP). Scenario c) | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **2024** | **2025** | **2026** | **2027** | **2028** | **2029** | **2030** | **2031** | **2032** | **2033** | **2034** | **Variation rate 2034-2024** |
| Total Regions | 21.7 | 21.1 | 20.7 | 20.3 | 20.1 | 19.9 | 19.8 | 19.6 | 19.4 | 19.3 | 19.2 | -2.5 |
| Andalusia | 19.2 | 18.9 | 18.6 | 18.4 | 18.3 | 18.2 | 18.1 | 18.0 | 17.9 | 17.8 | 17.7 | -1.5 |
| Aragon | 19.9 | 19.8 | 19.6 | 19.4 | 19.3 | 19.1 | 18.9 | 18.7 | 18.5 | 18.4 | 18.2 | -1.6 |
| Asturias | 15.0 | 15.2 | 15.2 | 15.3 | 15.2 | 15.2 | 15.1 | 15.0 | 15.0 | 14.9 | 14.9 | -0.1 |
| Balearic Islands | 21.1 | 18.9 | 17.5 | 16.7 | 16.4 | 16.2 | 16.2 | 16.1 | 16.0 | 16.0 | 15.9 | -5.2 |
| Canary Islands | 11.7 | 10.1 | 9.0 | 8.4 | 8.2 | 8.2 | 8.3 | 8.5 | 8.7 | 8.9 | 9.0 | -2.7 |
| Cantabria | 19.8 | 20.0 | 20.1 | 20.1 | 20.2 | 20.1 | 20.1 | 20.0 | 19.9 | 19.8 | 19.7 | -0.1 |
| Castile-La Mancha | 31.0 | 31.0 | 30.7 | 30.3 | 29.9 | 29.4 | 28.9 | 28.5 | 28.1 | 27.7 | 27.4 | -3.6 |
| Castile and Leon | 19.5 | 19.6 | 19.5 | 19.3 | 19.2 | 19.0 | 18.8 | 18.6 | 18.5 | 18.3 | 18.2 | -1.3 |
| Catalonia | 30.2 | 29.2 | 28.5 | 28.0 | 27.6 | 27.2 | 26.8 | 26.5 | 26.2 | 25.9 | 25.6 | -4.6 |
| Extremadura | 21.2 | 21.8 | 22.1 | 22.1 | 22.1 | 21.9 | 21.6 | 21.4 | 21.2 | 21.0 | 20.8 | -0.4 |
| Galicia | 15.8 | 16.0 | 16.0 | 16.0 | 16.0 | 16.0 | 15.9 | 15.8 | 15.8 | 15.7 | 15.7 | -0.2 |
| La Rioja | 15.7 | 15.8 | 15.9 | 16.0 | 16.1 | 16.1 | 16.1 | 16.1 | 16.1 | 16.1 | 16.1 | 0.3 |
| Madrid | 12.3 | 11.7 | 11.4 | 11.1 | 11.1 | 11.1 | 11.1 | 11.1 | 11.2 | 11.3 | 11.3 | -0.9 |
| Murcia | 30.4 | 29.8 | 29.1 | 28.6 | 28.2 | 27.8 | 27.4 | 27.0 | 26.7 | 26.4 | 26.0 | -4.4 |
| Navarre | 12.0 | 11.9 | 11.8 | 11.7 | 11.8 | 11.8 | 11.9 | 11.9 | 12.0 | 12.1 | 12.1 | 0.1 |
| Basque Country | 12.3 | 12.3 | 12.2 | 12.2 | 12.3 | 12.3 | 12.4 | 12.5 | 12.6 | 12.6 | 12.7 | 0.3 |
| Community of Valencia | 40.2 | 39.2 | 38.2 | 37.3 | 36.5 | 35.9 | 35.2 | 34.6 | 34.0 | 33.5 | 33.0 | -7.2 |

| | Table 8. Public debt (% GDP). Scenario d) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | **2024** | **2025** | **2026** | **2027** | **2028** | **2029** | **2030** | **2031** | **2032** | **2033** | **2034** | **Variation rate 2034-2024** |
| Total Regions | 21.7 | 21.1 | 20.7 | 20.3 | 20.1 | 19.9 | 19.8 | 19.6 | 19.5 | 19.3 | 19.2 | -2.5 |
| Andalusia | 18.9 | 18.4 | 18.0 | 17.6 | 17.2 | 16.9 | 16.6 | 16.3 | 16.0 | 15.7 | 15.4 | -3.5 |
| Aragon | 20.0 | 20.1 | 20.0 | 19.9 | 19.8 | 19.8 | 19.7 | 19.6 | 19.5 | 19.5 | 19.4 | -0.6 |
| Asturias | 14.4 | 14.0 | 13.6 | 13.0 | 12.5 | 12.0 | 11.4 | 10.8 | 10.3 | 9.8 | 9.3 | -5.1 |
| Balearic Islands | 20.9 | 18.5 | 16.9 | 16.0 | 15.4 | 15.1 | 14.8 | 14.6 | 14.3 | 14.1 | 13.8 | -7.0 |
| Canary Islands | 10.5 | 7.7 | 5.5 | 3.7 | 2.3 | 1.2 | 0.2 | -0.6 | -1.4 | -2.2 | -2.9 | -13.4 |
| Cantabria | 19.5 | 19.4 | 19.2 | 18.9 | 18.7 | 18.4 | 18.0 | 17.7 | 17.3 | 16.9 | 16.6 | -2.9 |
| Castile-La Mancha | 31.1 | 31.3 | 31.2 | 30.9 | 30.6 | 30.2 | 29.9 | 29.5 | 29.2 | 29.0 | 28.8 | -2.3 |
| Castile and Leon | 19.4 | 19.4 | 19.2 | 18.9 | 18.7 | 18.4 | 18.1 | 17.9 | 17.6 | 17.4 | 17.2 | -2.2 |
| Catalonia | 30.5 | 30.0 | 29.6 | 29.4 | 29.4 | 29.4 | 29.4 | 29.4 | 29.4 | 29.4 | 29.5 | -1.1 |
| Extremadura | 21.4 | 22.3 | 22.8 | 23.1 | 23.2 | 23.3 | 23.3 | 23.2 | 23.2 | 23.3 | 23.3 | 1.9 |
| Galicia | 15.4 | 15.0 | 14.6 | 14.1 | 13.7 | 13.2 | 12.7 | 12.3 | 11.8 | 11.3 | 10.9 | -4.5 |
| La Rioja | 15.4 | 15.2 | 15.0 | 14.8 | 14.7 | 14.5 | 14.2 | 14.0 | 13.7 | 13.5 | 13.2 | -2.2 |
| Madrid | 12.2 | 11.5 | 11.1 | 10.7 | 10.6 | 10.5 | 10.4 | 10.4 | 10.4 | 10.4 | 10.4 | -1.8 |
| Murcia | 31.5 | 31.8 | 32.1 | 32.5 | 33.1 | 33.7 | 34.3 | 34.9 | 35.5 | 36.1 | 36.8 | 5.3 |
| Navarre | 11.0 | 9.9 | 8.8 | 7.9 | 7.0 | 6.2 | 5.4 | 4.6 | 3.8 | 3.0 | 2.3 | -8.6 |
| Basque Country | 11.6 | 10.8 | 10.0 | 9.4 | 8.8 | 8.2 | 7.6 | 7.0 | 6.5 | 6.0 | 5.4 | -6.2 |
| Community of Valencia | 41.2 | 41.2 | 41.1 | 41.1 | 41.3 | 41.6 | 41.9 | 42.3 | 42.7 | 43.1 | 43.6 | 2.4 |

# 5. Discussion of policy implications

The debate on public debt sustainability at subnational level shows some particularities not directly found when focused on national dimension. In the latter, the discussion uses to pay attention to the difference between the growth rate of GDP and the interest rate, and obviously to the ability of the government to achieve primary surpluses. When lower tiers of government are at play, however, additional factors must be taken into consideration as well. They are closely related to the presence of soft budget constraints.

One of these factors is related to the usual equalization existing in most territorial financing systems; as it is well-known, this implies a break into the standard relationship between the economic activity, which is reflected in the growth rate of GDP, and the fiscal capacity of the subnational government. Indeed, a significant part of the local/regional public resources is based on intergovernmental grants, in turn depending upon relative spending needs and fiscal capacities.

Under such as conditions, the payoffs from the equalization formula are overweight in the fiscal management of subnational governments and may result in overborrowing as long as they expect additional resources from the central in the future (Breuillé and Vigneault, 2010; Guo et al., 2022, with an application to Spain). Moreover, the Spanish case illustrates how important is the design of equalization system for determining the overborrowing differentials across regions (Barrios and Martínez-Lopez, 2017).

The other factor, linked to the previous one, is the likelihood of receiving bailouts when the subnational governments are subject to financial stress. Literature on this issue, is extensive (see, for instance, Goodspeed (2017) for a survey) and in general, unless the federal government transmits the idea that its resources are not unlimited (Martínez-López, 2022), regional and local governments tend to overborrow based on bailout expectations.

Both circumstances favor therefore soft budget constraints at subnational level. And our findings provide an estimation of the price to be paid in terms of fiscal consolidation as result of such soft budget constraint. In the Spanish case, moreover, we have a territorial financing system with no clear pattern of equalization and continuous implicit bailouts through the extraordinary financing mechanisms over more than a decade. Consequently, given the huge overborrowing generated as result, the fiscal efforts necessary to achieve the legal benchmarks in regional public debt seem to be far from feasibility. Thus, setting a coherent plan to cope with the Spanish regional indebtedness would require sound reforms in the territorial financing system and in the performance, if not removal, of the extraordinary mechanisms like the FLA and others.

Nonetheless, it is likely that such as policy changes are not enough to guarantee a sustainable path for most of the Spanish regions, specially whether the extraordinary financing mechanisms are dropped, or even progressively dismantled. As it was shown in our results, many regional governments should implement processes of fiscal consolidation so intense, compared with the fiscal behavior in past times, that become unrealistic.

And here a new option should be considered, namely, debt relief of public regional liabilities owned by the central government (about 60 percent of the total Spanish regional borrowing). Given the methodology followed and the findings of this paper, we really believe that the design of a possible debt relief for the Spanish regions must fulfill two requirements. One is that the sustainability of regional public debt should be pursued not only as an obvious objective itself but also as an instrument to allow the regional governments raise funds in the capital markets. In other words, a decreasing and feasible path of the regional borrowing over GDP must be at play after the application of debt relief. Subnational liabilities must be payable in a context of capital markets, which should become the exclusive way for financing deficits.

The second requirement is that, based on the existing remarkable heterogeneity across regions in terms of indebtedness, the criteria to proceed with debt relief must be transparent and clear-cut, not subject to political or discretionary interests. Obviously, strong conditionality after receiving the bailout may help for avoiding soft budget constraints in the beneficiary governments (Baskaran, 2017). Otherwise, the explicit bailout that the debt relief implies would intensify the associated moral risk, as long the policy decisions might be seen as a result of political pressures (Pettersson-Lidbom, 2010).

A singular issue to come is how the new European fiscal rules will be applied to the regional contexts in fiscal decentralized countries like Germany, Austria, Belgium and Spain. Indeed, the final design of the Eurozone fiscal framework has been recently confirmed at high-level institutions of the EU. Particularly, for those countries "[w]here the general government debt is above the 60% of GDP or the general government deficit exceeds the 3% of GDP, the Commission shall transmit to the Member State concerned and to the Economic and Financial Committee a reference trajectory for the net expenditure covering an adjustment period of 4 years" (Official Journal of the European Union, 2024 a, b and c). The public debt to GDP ratio becomes then the anchor variable to be achieved and the public spending the instrumental tool to get it.

The question is to what extent this scheme can be translated to subcentral governments. In principle, no obstacles arise to do it. The European Stability and Growth Pact leaves freedom for defining the national framework of fiscal discipline. In this context, our approach focused on the regional public indebtedness is particularly relevant. Notwithstanding this, some caveats must be put on the table. One refers to the fact that many regional/local governments are in charge of providing public expenditures such as health care or education. These expenditures are very rigid to be adjusted, especially at lower levels of government, in which the closeness to voters add pressures for increasing them. Therefore, the effectiveness of fiscal rules based on expenditure benchmarks could be not enough for guaranteeing the sustainability of subnational public debts.

Moreover, the European framework of fiscal rules allows adjustments in the expenditure benchmarks as long as tax revenues increase or decrease as result of tax policy changes. In the case of lower tiers of government, their tax autonomy uses to be not very high and, consequently, the room for maneuver for effective fiscal consolidations could not be

sufficient. Therefore, alternative proposals keeping the focus on the debt reduction but broadening the instruments available at regional/local level must be considered. In this sense, Martínez-López and González (2022) set up a methodological approach in which each region is assigned to a particular objective of debt reduction through deficit reduction. This is applied to the case of the Spanish regions, giving them more options for decreasing the public debt to GDP ratio.

One of the most usual fiscal rules at subnational level is the so-called golden rule (Ter-Minassian, 2016). As it is well-known, it requires that subnational governments' current budgets be at least balanced, devoting resources from borrowing exclusively to funding public investments. This provision uses to be accompanied by limits on sub-national debt stocks or debt service in terms of current revenues. Germany Lander and Spanish regions are examples of such as fiscal rules.

The experience, however, is far from being optimal. In the Spanish case, although the LOFCA establishes a golden rule for the ACs, the extraordinary financial mechanisms allow to use borrowing to cover current deficits. In other countries, the outcomes have not been the expected: the governments circumvent the golden rule by reclassification of expenditure from recurrent to capital and borrowing through regional government-owned enterprises (Saxena, 2022).

Other non-desired result from golden rules is to focus the fiscal consolidation in cutting capital expenditures. The composition of public spending and, particularly, the bias towards current expenditures have remarkable and non-positive effects on regional growth, and the necessary advances on fiscal sustainability should not be made at price of limiting the potential economic growth. Moreover, even limiting borrowing to investments, there are no guarantees that such capital spending is invested on productive projects, and operating expenditures must be considered to assess their financial sustainability in the future (de Biase and Dougherty, 2022).

# 6. Concluding remarks

Borrowing will be in the center of the European fiscal policy discussion in the next years. This is motivated by the intrinsic concern generated by the high amount of public debt accumulated after the pandemic COVID-19 and, accordingly, the new European fiscal rules will be based on explicit public debt to GDP ratios as objective to be achieved.

In this article, we have addressed the Spanish public debt at regional level from different views. Firstly, the regional public debt has been disaggregated into the fundamental factors driving its evolution over 2015-2023. We have highlighted that the effect of changes in GDP growth is the main driver of change. In turn, the primary public balance has worsened in general the regional public debt to GDP ratio, with the recent exceptions of years 2020 and 2021. Notwithstanding this, the relatively high positive deficit-debt adjustments have also contributed to the time pattern followed by the regional public debt.

Secondly, we have computed the fiscal consolidation effort (in terms of primary surplus) needed to reach a determined level of public debt during different time horizons (5, 10 and 20 years), with several assumptions on interest rates and GDP growth. Given the remarkable regional heterogeneity, the results are closely linked to the initial levels of public debt. There are some regions with public debt already below the objective of 13% of GDP in 2023 which can preserve it in line with their historical primary balances. By contrast, the regions highly indebted will need so high primary surplus to arrive at the objective that the path is unfeasible.

Finally, we have simulated the evolution of regional public debt to GDP ratio under some fiscal consolidation strategies. In the so-called *conservative* scenario, in which the structural public balance estimated in 2023 keeps unchanged over the period from 2024-2034, two regions (Murcia and Community of Valencia) will substantially worsen their initially flawed situation in terms of public debt. By contrast, those regions with structural surplus in 2023 will substantially reduce their public debt to GDP ratio. When more exigent fiscal consolidation scenarios are considered (*reactive*), again the highly indebted regions hardly improve the level of debt.

A few policy implications have been discussed based on our results. We have guessed the likely relationship between the presence of soft budget constraints and the overborrowing of the Spanish regions. In this context, the extraordinary mechanisms, acting as implicit bailouts, should be substantially reformed, if not removed. And even initiatives of debt relief led by the central government might be taken account.

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