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Please address correspondence to Banco de Portugal, Economics and Research Department Av. Almirante Reis 71, 1150-012 Lisboa, Portugal T +351 213 130 000 | estudos@bportugal.pt



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João Amador Banco de Portugal Cláudia Braz Banco de Portugal

Maria M. Campos Banco de Portugal Sharmin Sazedj Banco de Portugal

Lara Wemans Banco de Portugal

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Abstract

Following the recent economic and financial crisis, public debt ratios increased considerably in most European Union countries, reaching historically high levels. Against this background, issues regarding the outlook for the debt ratio and the analysis of the sustainability of public finances in Member States became central in the economic policy analysis of European authorities. This Occasional Paper aims to address, in an integrated manner, the various aspects of the discussion on public debt sustainability, with a particular focus on the Portuguese case and on the constraints associated with the institutional and economic environment in the euro area. In this respect, the text approaches the concepts and methodologies used to assess sustainability, lists the existing assessment rules for euro area countries, presents its results for Portugal and refers to the main ongoing discussions on high debt levels.

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E-mail: jamador@bportugal.pt; crbraz@bportugal.pt; mmcampos@bportugal.pt; ssazedj@bportugal.pt; lcwemans@bportugal.pt

1. Background¹

According to the analysis developed in the past few decades, high levels of public debt tend to persist over time and potentially generate adverse effects on economic growth in the long term.² In addition, high public debt ratios may lead to a greater perception of the risk of unsustainability by financial markets. At an earlier stage, this results in an increase in country-specific risk and consequently in sovereign debt spreads, but may also spill-over to the interest rate on loans to the remaining sectors of the economy.³ These effects are more likely when the fundamentals of the economy are unfavourable, but may also materialize through changes in economic agents' expectations.⁴ In this case, the increase in sovereign debt spreads is abrupt and, in general, considerable in size. Some literature has attempted to establish thresholds for the debt ratio that trigger adverse effects on the economy. However, given the diversity and interaction of all factors involved, which are also difficult to quantify, these thresholds are hard to determine in practice.

Following the recent economic and financial crisis, public debt ratios increased considerably in most European Union (EU) countries, reaching historically high levels (Figure 1.1). For some countries, the accumulation of public debt derived from the expansionary fiscal policies implemented in the years following the inception of the euro area. After the onset of the global financial crisis, fiscal policy became more expansionary in several Member States, partly as a response to the request for a coordinated stimulus by the European Commission at the end of 2008, which contributed to deteriorate the situation. Portugal was no exception, having recorded an increase of around 60 percentage points in the debt ratio in the 2007-15 period, twice as much as that in the euro area and in the EU. At the end of 2015, the public debt ratio stood at 129.0 per cent in Portugal, compared with 90.7 per cent in the euro area. Against this background, issues regarding the outlook for the debt ratio and the analysis of the sustainability of public finances in Member States became central in the economic policy analysis of European authorities.

^{1.} The definition of public debt used throughout this text corresponds to Maastricht debt (i.e. consolidated general government gross debt at nominal or face value, including liabilities in currency and deposits, debt securities and loans).

^{2.} See Kumar and Woo (2015) and Reinhart et al. (2012).

^{3.} For a reference to a number of euro area-specific factors which may have increased the potential for contagion between sovereign credit risk and that of other sectors of the economy, see Arellano *et al.* (2015).

^{4.} For an analysis of the role played by the interaction between economic agents' expectations and macroeconomic fundamentals in triggering a sovereign debt crisis, see Teles (2014).

The literature does not concur on the definition or methodology that should be used to assess public debt sustainability. Overall, it may be said that debt sustainability requires governments to be both solvent and liquid (European Central Bank, 2012). Assuming that a State is solvent when the loans obtained are paid under the terms agreed upon, solvency requires that the government's inter-temporal budget constraint is fulfilled, stipulating that the net present value of the future primary balances must be at least as high as the net present value of outstanding public debt.

From this perspective, public debt is considered sustainable in the medium to long run if the required fiscal balances are realistic in both political and economic terms. Liquidity is a short term concept and refers to a government's ability to maintain access to financial markets for the purposes of financing maturing debt and additional funding needs.



FIGURE 1.1: Public debt developments in euro area countries Source: Eurostat.

Note: Data for the euro area are consolidated for intergovernmental loans granted in the context of the economic and financial crisis.

Debt sustainability analysis covers alternative approaches, with a clear trade-off between simplicity and theoretical soundness. Conventional debt sustainability analysis is based on the equation describing its dynamics, supported by different deterministic scenarios (usually a baseline and other scenarios for sensitivity analysis), on the basis of assumptions for developments in the primary balance, the implicit interest rate on debt, the growth rate of nominal GDP and deficit-debt adjustments. Synthetic indicators are frequently calculated to present the medium and long term perspectives included in these simulations. This approach is transparent, easy to apply and to communicate to the public. However, it has its drawbacks, as it does not quantify the uncertainty associated with underlying projections. In particular, the analysis is carried out in partial equilibrium, and does not take into account the interaction between the different variables.

Over the past few decades, literature has been presenting unconventional approaches for debt sustainability analysis, typically based on general equilibrium models or on the estimation of stochastic models which identify a reference scenario (typically the median scenario) on the basis of past shocks and calculate confidence bands for different degrees of uncertainty in debt ratio developments. However, these methodologies are subject to the usual criticism of model-based approaches, as their results are more difficult to interpret and communicate and are dependent on past information.

More recently, following the sovereign debt crisis, studies have been carried out on early warning indicators to identify liquidity risks faced by governments in the short term. In general, these composite indicators are based on a broad set of fiscal, macroeconomic and financial variables, for which critical thresholds are established with a view to maximize their ability to identify crises. The main drawbacks of this type of indicator arise from the fact that critical thresholds are based on historical crises, which may not occur again, and that interactions between the different variables are not considered.

The concept of public finance sustainability plays a central role in multilateral fiscal surveillance at European level. Currently, in addition to the rule on the reduction of the debt ratio, introduced by the 2011 reform of the Stability and Growth Pact (SGP), there are several references to public debt sustainability. Against this background, the European Commission publishes its review of public finance sustainability in Member States every three years (2006, 2009, 2012 and 2015). The most recent report calculates separate short, medium and long term indicators, in order to identify the probability of a crisis materialising in each of these points in time. This report signals Portugal as one of the countries with important risks of public debt unsustainability, highlighting the crucial role of sustainable fiscal policies at national level, supported by an appropriate institutional framework and promoting quality and efficiency in the allocation of public resources.

The issue of public debt sustainability has been present in several ongoing debates in Europe. The first debate arises from protracted low economic growth in some countries and is related to the discretionary use of fiscal policy to stimulate economic activity. This is particularly relevant in the current context of interest rates close to zero which limit recourse to monetary policy instruments. In this debate, it has become clear that fiscal policy can only play a stabilising role where there is fiscal space, implying that the conditions for debt sustainability have been met. Against a background of extremely high debt ratios in several euro area countries with low prospects of decrease in the next few years, the second debate focuses on issues regarding policy coordination and sovereign debt restructuring. The third debate emphasises the impact of low inflation on debt sustainability, both through a direct effect on the fiscal balance and on the denominator effect building on the fact that most methodologies are based on developments in the debt-to-nominal GDP ratio.

This Occasional Paper aims to cover different perspectives of debt sustainability analysis, highlighting the Portuguese case where possible. The text is thus organised as follows: Section 2 presents the main concepts and methodologies of debt sustainability analysis. Section 3 describes developments in the public debt ratio in Portugal, identifying the pressures arising from debt refinancing in the coming years. In addition, it presents a number of deterministic projection scenarios for the debt ratio in the next few decades. The role played by the public debt ratio and sustainability analysis in the context of the SGP is analysed in Box 2. Section 4 shows the European Commission's current methodology, as well as more recent results, notably for Portugal. Section 5 focuses on some of the discussions at European level around the issue of debt sustainability: the role of discretionary fiscal policy, policy coordination and the effect of low inflation. As an illustration, Box 3 describes the case of three euro area countries that have relevant experience in terms of developments in debt ratios. Section 6 presents a few final remarks.

2. Definition and methodologies

The literature does not unequivocally identify the definition and best methodology for assessing public debt sustainability. Regarding the definition, it may be stated that debt sustainability has two aspects: fulfilment of the government's inter-temporal budget constraint in the medium and long term, and, in the short term, servicing upcoming obligations, through regular access to financial markets (European Central Bank, 2012). Solvency in the medium and long term requires that the net present value of future primary balances is realistic in both political and economic terms and at least as high as the initial net value of public debt.⁵ In the short term, a country facing increased difficulties accessing financial markets typically pays higher interest rates to refinance maturing debt and finance new funding needs, with adverse repercussions on the sustainability

^{5.} For a calculation of the government's inter-temporal budget constraint, see Barbosa (1997).

of its medium term debt. In this situation, public debt with non-indexed interest outlays and a longer average maturity is the most favourable option (see Box 1 for a description of the effects of the inflation rate and risk premia in an infinite time horizon).

As regards the methodologies, the **conventional analysis** of debt sustainability is based on the debt dynamics equation. This equation relates changes in the debt ratio in each period to the primary deficit, interest expenditure, nominal GDP growth and deficit-debt adjustments (see Appendix I for a derivation of the debt dynamics equation):

$$\Delta\beta = \delta_t + \frac{(i_t - y_t)}{(1 + y_t)}\beta_{t-1} + dda_t \tag{1}$$

where

 β is the debt ratio δ is the primary deficit as a percentage of GDP *i* is the implicit (nominal) interest rate on debt *y* is the nominal GDP rate of change *dda* are the deficit-debt adjustments as a percentage of GDP

Deficit-debt adjustments are used to align the definitions of deficit and change in public debt, which in this Occasional Paper stand for the amounts recorded in the general government deficit under National Accounts, but not under Maastricht debt, and vice-versa.

The conventional debt sustainability analysis is based on this equation and on assumptions for the relevant variables, in order to build deterministic scenarios for developments in the public debt ratio. Typically, a baseline scenario is chosen, which is assumed to be the most likely, and alternative scenarios to carry-out sensitivity analysis to the initial parameters. In addition, synthetic indicators are calculated in order to present results in a concise manner and make them easier to communicate to the public. The synthetic indicators more frequently used are the S1 indicator, which represents a constant change in the primary balance over GDP needed to reach a target debt ratio (in general, 60 per cent of GDP), over a specific time horizon, and the S2 indicator, which represents a constant change in the primary balance over GDP needed to ensure compliance with the inter-temporal budget constraint.⁶ An alternative, particularly when carrying out a cross-country analysis, is to calculate the present value of future debt. However, this approach implies the adoption of an assumption on the discount rate to be used.

^{6.} For a recent reference with a mathematical derivation of these indicators, see European Commission (2015).

The conventional debt sustainability analysis is transparent, easy to apply and communicate, but has important conceptual limitations. Firstly, the considered assumptions underlying the projections must be realistic in both political and economic terms. For example, assumptions of a large primary surplus for a prolonged period of time may be considered unrealistic if unprecedented, as well as a convergence of potential output to a high level in the absence of significant structural reforms. Secondly, the analysis is conducted in partial equilibrium, i.e. not taking into account important interactions between the fiscal and macroeconomic variables that drive the debt dynamics. If the variables used in the simulation show a strong trend (for example, if a significant fiscal consolidation effort is expected over the horizon), the potential bias resulting from not considering these effects would be higher. Some authors attempted to address this limitation by estimating a simultaneous equation system with the relevant variables for the approach, where estimated coefficients were then used to create an 'endogenous' scenario around the baseline scenario (see European Central Bank, 2012). Thirdly, the analysis usually focuses on explicit fiscal liabilities. The main exception is related to the impact of demographics on the fiscal balance. Several exercises attempt to take this impact into account by using projections for ageing costs developed by the Ageing Working Group. Other implicit liabilities, such as support to stateowned enterprises or the financial sector, guarantees provided by the general government and liabilities related to public-private partnerships (PPP) are typically not included in conventional debt sustainability analysis. Lastly, since the concept of Maastricht debt is defined in gross terms, possible fluctuations in general government financial assets must be taken into account in the analysis by assuming non-zero deficit-debt adjustments. However, this is not always the case.

Several **unconventional approaches** for debt sustainability analysis attempt to address the criticism that there is an absence of interaction between variables. One strand of studies uses general equilibrium models to foresee developments in the debt ratio (see, for example, European Commission, 2011). With this type of models it is important to assess whether the policies required to consolidate public finances and promote debt sustainability are realistic and take into account fiscal limits. This approach is subject to the usual criticism of general equilibrium models, in particular the fact that calibrations are based on historical correlations between variables. Indeed, the calibrations may vary with the introduction of new policies, which may, to a certain extent, bring back the problems of using a partial equilibrium analysis. In addition, there is a vast literature showing empirical evidence of non-linear effects on, for example, economic growth and sovereign debt spreads, which may occur above a particular public debt threshold. Nevertheless, this is not directly transposed into a sustainability analysis based on general equilibrium models. Another strand of the unconventional analysis is based on the estimation of stochastic models including the variables relevant for debt dynamics, which attempt to identify the correlation between shocks observed in the past. In this respect, two techniques are frequently used: fan-charts and VAR models. In the first case (see IMF, 2013), historical data are used to generate sample averages and a variance-covariance matrix, defining the joint distribution of the variables. This matrix is used to generate shocks and determine the distribution of paths projected for the debt ratio. In the second case, the historical relationship between variables is determined on the basis of a VAR model. The results of the stochastic models are usually presented in charts, where the baseline scenario corresponds to the median scenario and confidence bands represent varying degrees of uncertainty in debt ratio developments. As in general equilibrium models, the criticism that the results are dependent on historical data applies.

Governments for which the analysis indicates low sustainability risks in the medium and long term may also face difficulties refinancing debt in the short term. This possibility was confirmed during the recent sovereign debt crisis, resulting in a strand of literature on early warning indicators for fiscal stress, usually used in the context of banking and currency crises.⁷ These indicators aim to identify liquidity risks faced by governments in the short term and, in general, are based on a broad set of fiscal, macroeconomic and financial variables. In most recent studies critical thresholds are defined for the different variables and/or for a composite indicator, based on their behaviour before fiscal stress episodes.⁸ These thresholds aim to maximize the ability to detect risks of the variable/indicator by minimising errors in the identification of crisis events. The main drawbacks of this type of indicator stem from the fact that critical thresholds are frequently not country-specific (due to limitations in terms of the number of observations), it is based on historical crises which may not occur again and it does not normally consider interactions between the different variables.

Methodologies for debt sustainability analysis have evolved to encompass the various approaches mentioned above. The **International Monetary Fund** (IMF) publishes guidelines and spread sheets for debt sustainability analysis, whose latest update was carried out in 2013. In this document, the IMF recommends that the basic debt sustainability analysis should be conducted mostly through the preparation of a baseline and alternative scenarios. However, for countries considered as 'high scrutiny' cases (high

^{7.} See, for example, European Commission (2015), for an explanation of the S0 indicator, and Hernández de Cos *et al.* (2014).

^{8.} The second most frequent approach in the euro area is the use of multivariate regressions based on probit and logit models.

current or projected gross financing needs-to-GDP ratio or seeking exceptional access to IMF resources), an additional risk analysis is required to identify the realism of the baseline scenario, the vulnerability of the projected debt profile, the sensitivity to macro-fiscal shocks and possible contingent liabilities. In terms of reporting, the spread sheet provided also allows for the creation of fan-charts that show a spectrum of possible outcomes for the debt ratio in the medium term based on the simulation of shocks derived from the stochastic properties implicit in the past relationship between fiscal and macroeconomic variables. In addition to this type of chart and a report describing the risk analysis, the IMF recommends that high scrutiny countries synthetically present the results in heat maps. The latest application of this methodology to Portugal occurred in the IMF report prepared after the third review of the Post-Programme Monitoring, published at the end of March 2016. In turn, the methodology currently used by the **European Commission** is described in Section 4 of this Occasional Paper.

Box 1. The implications of the monetary framework for debt sustainability

The orientation of monetary policy is reflected on fiscal developments and the conditions for public debt sustainability, specifically through the impact on inflation rates and risk premia. These effects may be assessed by a dynamic analysis, i.e. by taking into account developments in variables over an infinite time horizon. The outcome of this analysis crucially depends on economic agents' ability to anticipate shocks on inflation, the degree of indexation of relevant variables to the inflation rate and the maturity structure of public debt.

From this perspective, outcomes mainly depend on developments that occur in the real interest rate, which reflect the debt servicing burden. The real interest rate corresponds to the difference between the nominal interest rate and expected inflation (Fischer equation), i.e. the difference between growth in the nominal value of debt and the expected growth in prices. However, ex-post developments in prices may differ from the anticipated, imposing a change in debt servicing costs. In this context, taking an initial nominal interest rate, a higher real interest rate resulting from an unanticipated decline in inflation increases the debt servicing burden. The longer the maturity of government bonds issued using the initial nominal interest rate, the greater this effect. In turn, in a scenario where there is an absence of shocks to inflation, a decrease in risk premia materialising in lower nominal interest rates implies a reduction in the real interest rate. In this case, the shorter the debt maturity, the higher the decrease in debt servicing costs, as it would be faster to refinance in more favourable conditions. However, the existence of shorter maturities for public debt exposes countries to disruptions in external financing.

3. Public debt developments in Portugal

The first years of the Economic and Monetary Union (EMU) were characterised by favourable developments in terms of economic growth and sovereign financing costs. In Portugal, however, these conditions were not fully leveraged on to improve the fiscal situation. On the contrary, up to 2007 fiscal policy mostly assumed an expansionary stance that contributed to an accumulation of primary deficits and an ensuing increase in public debt as a percentage of GDP. This proceeded at a relatively slow pace, whereas in the euro area as a whole the debt-to-GDP ratio remained virtually unchanged (Figure 3.1). At the end of 2007 the debt ratio amounted to 68.4 per cent in Portugal (64.9 in the euro area) and, subsequently, it started to grow very significantly.



FIGURE 3.1: Public debt as a percentage of GDP: 1999-2015 Source: European Commission.

The strong growth of debt was widespread across the euro area, but particularly significant in Greece, Ireland, Spain, Slovenia, Portugal and, to a lesser extent, also in Cyprus (Figure 3.2). In these countries the rise in the debt ratio was accompanied by an increase in debt financing costs, disrupting access to international markets (Figure 3.3). Indeed, within the scope of the crisis, Greece, Ireland, Portugal and Cyprus resorted to economic and financial assistance programmes.



FIGURE 3.2: Breakdown of the change in the debt ratio in the euro area and Portugal: 1999-2015

Source: European Commission.



FIGURE 3.3: Evolution of 10 year bond yields on public debt: 2008-2015 Source: Thomson Reuters.

In Portugal, between 2007 and 2015 the debt ratio rose by 60.6 p.p. of GDP, compared with 28.6 p.p. of GDP in the euro area as a whole. At the end of 2015, public debt in Portugal stood at 129.0 per cent, compared with 93.5 per cent in the euro area. In 2015 this indicator stood below the 60 per cent threshold in only five of the 19 Member States.

In Portugal, as in the euro area as a whole, the main contribution to the increase in the debt ratio in the 2007-2015 period were the servicing costs associated with the stock of debt (Figure 3.2). This effect was amplified by the existence of primary deficits in most years, particularly in 2009 and 2010, reflecting to a large extent the implementation of stimulus measures under the European Economic Recovery Plan put forward by the European Commission in late 2008. However, the cumulative contribution made by primary deficits was approximately three times higher than in the euro area. Against the background of low, or even negative, nominal GDP growth (0.9 per cent in average annual terms), the denominator effect associated with economic growth was negligible. Given that the implicit interest rate on debt stood, on average, at 4.0 per cent, the so-called "snowball effect" explains about half of the rise in the Portuguese debt ratio during this period (30.2 p.p. of GDP, compared with 13.6 p.p. in the euro area as a whole). Lastly, the impact of positive deficitdebt adjustments was also substantial in this period. It chiefly resulted from an accumulation of general government deposits (particularly between 2010 and 2012) and unfavourable valuation effects which more than offset proceeds from privatisations during the assistance programme.

Figure 3.4 breaks down by instrument the 2015 public debt stock across euro area countries. It shows that the bulk of the stock corresponds to long term securities. However, this percentage is substantially higher in the euro area as a whole than in Portugal (73.5 and 48.1 per cent respectively), where it refers almost exclusively to Treasury Bonds. In turn, the share of long term loans is very high in Portugal (as well as in Greece and Cyprus) compared to that of the euro area, reflecting the financing obtained under the Economic and Financial Assistance Programme. Furthermore, the share of short term debt in Portugal is very similar to that of the euro area and, as such, it does not imply greater refinancing risks. Also, according to the latest data (for the end of 2014), in most euro area countries the bulk of public debt is denominated in euro, resulting in low exchange rate risks. The classification by holder shows that, at the end of 2014, half of euro area public debt was held by non-residents. In Portugal, also as a result of IMF loans, this percentage was slightly above average.

The maturity structure of medium and long term debt has major implications for the assessment of debt sustainability. In the case of Portugal, over the past few years the average residual maturity of (State) public debt has increased substantially: from approximately 6 years at the beginning of the Economic and Financial Assistance Programme to the current value slightly below 9 years. However, the redemption profile of State direct debt is still highly concentrated in the period up to 2025, after which it is basically foreseen the repayment of



FIGURE 3.4: Breakdown of the stock of public debt by instrument - December 2015 Source: Eurostat.

the loans obtained under the Programme (Figure 3.5).⁹ This suggests that, over the next decade, the issuance of public debt resulting from refinancing needs is expected to remain high, increasing vulnerability to market conditions (Figure 3.6). In addition, there are risks stemming from the financing of budget deficits, whose magnitude will depend on the medium term fiscal policy stance.

As mentioned in Section 2, the standard debt sustainability analysis involves the construction of deterministic scenarios for debt ratio developments based on assumptions for the relevant variables. Figure 3.7 shows that in a scenario where the structural primary balance remains at its 2015 level, except for changes in age-related costs as projected by the European Commission and made public in the 2015 Ageing Report, Portugal's debt ratio would follow a slightly upward path up to 2060. In this scenario, it is assumed that up to 2018 macroeconomic developments are in line with Banco de Portugal forecasts released in the June 2016 Economic Bulletin. From 2018 onwards, the baseline scenario assumes that nominal GDP grows by approximately 3 per cent per year and that the implicit interest rate on debt remains constant at the value foreseen for 2018. Figure 3.8 illustrates a scenario similar to the previous, except

^{9.} This profile already reflects the extension of maturities (by 7 years) in the European funding component of the Financial Assistance Programme, under the restructuring implemented in 2013.



FIGURE 3.5: Redemption profile of State direct debt

Source: Portuguese Treasury and Debt Management Agency.

Note: The figure does not include redemptions of Treasury Bills, Saving Certificates, Treasury Certificates, *CEDIC* and *CEDIM*.



FIGURE 3.6: Portuguese public debt issuance

Source: Portuguese Treasury and Debt Management Agency.

for the assumption regarding compliance with the SGP commitments, even taking into account ageing-related costs.¹⁰ From 2015 onwards, convergence of the structural balance towards the medium term objective (MTO) (which, in the case of Portugal, corresponds to 0.25 per cent of GDP) is assumed to proceed at a pace of 0.25 p.p. of GDP in 2016 (in line with the latest Country Specific Recommendation to Portugal) and 0.6 p.p. of GDP per year over the remaining horizon.¹¹ Once this target is reached, total balance is assumed to remain constant. Under these conditions, the debt ratio would present a downward trend, reaching the threshold of 60 per cent of GDP after 2040. Note that, should the excessive deficit situation be corrected in 2016, a three year transition period begins. During this period fiscal consolidation must be compatible with the debt criterion from 2019 onwards. Even in the scenario where European commitments are complied with, the foreseeable trend would still fail to secure these conditions (for more details on the debt criterion under the SGP, see Box 2).

Except for the impact of demographics on the budget balance, the aforementioned analysis does not take into account the materialisation of contingent liabilities that would deteriorate the outlook for debt developments in a no-policy change scenario or that would make it more demanding to comply with SGP commitments. The quantification of this type of general

^{10.} In this exercise it is assumed that fiscal consolidation has a negative impact on GDP growth (considering a 0.8 multiplier as in European Commission, 2015).

^{11.} Note that, on the 2nd of August 2016, the Council of the EU has reassessed this orientation and recommended the stabilization of the 2016 structural balance with respect to its 2015 level. The resulting slower pace of convergence towards the MTO has a negligible impact on the exercise presented in Figure 3.8.



(A) Sensitivity to changes in the growth rate of GDP

(B) Sensitivity to changes in the implicit interest rate $% \left({{\left[{B_{i} \right]}_{i} \right]}_{i}} \right)$

FIGURE 3.7: Outlook for public debt developments in Portugal: scenario where the structural primary balance remains unchanged from 2015 onwards

Source: Authors' calculations.

Notes: Up to 2018, macroeconomic developments are in line with Banco de Portugal forecasts made public in the June 2016 Economic Bulletin. From 2018 onwards, the baseline scenario assumes that nominal GDP grows by around 3 per cent every year and that the implicit interest rate on debt remains constant at the value foreseen for 2018. With regard to primary balance, the 2015 structural figure remains unchanged as a percentage of GDP, except for changes in age-related costs as per the projections released in the 2015 Ageing Report. Shaded areas correspond to sensitivity analysis of the projected debt ratio to changes of +/-1 p.p. in the nominal GDP growth rate and of +/-0.5 p.p. in the implicit interest rate on debt.

government liabilities is not straightforward. Notwithstanding, the Eurostat releases since 2015 information for the three previous years regarding the amount of contingent liabilities in each euro area country. Although information is incomplete, Eurostat publishes estimates on the stock of government guarantees, the amount of non-performing loans granted by public entities, as well as contingent liabilities associated with PPP contracts and corporations classified outside general government that are directly or indirectly controlled by the government.¹²

^{12.} Eurostat releases information on contingent liabilities as of 2011 for all euro area countries excluding Cyprus. However, not all countries report data for the whole list of contingent liabilities categories. In the case of liabilities associated with PPP contracts, no information is available for Germany, whereas liabilities associated with public corporations exclude amounts for Germany and France, and no information is available on the amount of non-performing loans in the case of Belgium, France and Slovakia. Furthermore, given the inherent characteristics of data, their cross-country comparability is not perfect. Regarding liabilities associated with public corporations, the analysis must take into account that the share represented by these institutions varies significantly across countries. Also, in many cases, data reporting is not thorough, excluding e.g. liabilities associated with financial institutions or general government subsectors.



(A) Sensitivity to changes in the growth rate



(B) Sensitivity to changes in the implicit interest rate

FIGURE 3.8: Outlook for public debt developments in Portugal: scenario assuming compliance with SGP rules

Source: Authors' calculations.

of GDP

Notes: Up to 2018, macroeconomic developments are in line with Banco de Portugal forecasts made public in the June 2016 Economic Bulletin. From 2018 onwards, the baseline scenario assumes that nominal GDP grows by around 3 per cent every year and that the implicit interest rate on debt remains constant at the value foreseen for 2018. From 2015 onwards, the assumption is that the structural balance will converge towards the MTO (0.25 per cent of GDP) at a pace of 0.25 p.p. of GDP in 2016 and 0.6 p.p. of GDP per year over the horizon. Once the MTO is reached, total balance remains constant at that level. Shaded areas correspond to a sensitivity analysis of the projected debt ratio to changes of +/-1p.p. in the nominal GDP growth rate and +/-0.5 p.p. in the implicit interest rate on debt.

At the end of 2014, the total stock of contingent liabilities amounted, on average, to 51.9 per cent of GDP in euro area countries, compared with 92.7 per cent of GDP in Portugal (Figure 3.9). As in other EMU Member States, in Portugal these contingent liabilities are largely associated with liabilities of state-owned enterprises, particularly as regards financial corporations.¹³ Furthermore, State guarantees also contribute decisively to the high level of contingent liabilities in Portugal and in the euro area as a whole. In the case of Portugal, figures reported to Eurostat largely reflect the granting of guarantees to financial institutions during the crisis. It should be highlighted that the stock of guarantees at the end of 2014 (equivalent to 7.1 per cent of GDP) stood below the figures recorded between 2011 and 2013.

^{13.} The information released by Eurostat on public corporations liabilities is not consolidated, nor net of assets, and therefore may be overvalued. In the case of Portugal, of the 79.3 per cent of GDP recorded at the end of 2014, approximately 95 per cent corresponded to financial corporations.



FIGURE 3.9: Stock of contingent liabilities as at December 2014 Source: Eurostat.

Box 2. The role of the public debt ratio and sustainability analysis in the context of the Stability and Growth Pact

The concept of sustainability of public finances underlined the design of the SGP's architecture, which has been amended on several occasions. The ultimate goal of the multilateral fiscal surveillance mechanism is to guarantee that EU Member States adopt, in a coordinated manner, adequate economic policies that comply with the deficit and debt limits established by the Maastricht Treaty in 1992. From its outset, the SGP entails mechanisms to monitor deficits, as well as to reduce them should the 3 per cent of GDP threshold be exceeded. Subsequently, the 2005 reform has made explicit the concept of 'balanced or in surplus budgetary situation' with the establishment of the MTO. This objective sets out country-specific levels for the structural balances, as well as a convergence path towards them.

The debt criterion was operationalised only in 2011, within the scope of the second SGP reform. Under this criterion, a Member State is noncompliant if its public debt ratio is above 60 per cent of GDP and is not approaching the reference value at a satisfactory pace. The adequate path implies that the differential between the debt ratio and the threshold reduces at an average rate of 1/20 each year over the past three years. Breaches of the debt criterion are assessed under three perspectives: the backward-looking benchmark (calculated on the basis of the debt ratio over the past three years), the forward-looking benchmark (based on the debt ratio for the previous, current and following years) and a measure adjusted for the impact of the economic cycle (where the numerator is adjusted for the cyclical component of the budget balance and the denominator is the nominal potential GDP).^{*a*} The debt criterion is considered to be breached only if a country fails to comply under all of these perspectives. The debt criterion entered into force as part of the 'Six-Pack' reform in November 2011. However, Member States subject to an excessive deficit procedure were granted a three-year transition period after the correction of the situation. During this period, Member States must comply with a minimum linear structural adjustment to ensure compliance with the debt criterion by its end. To this date, no excessive deficit procedure has been initiated on the basis of the debt criterion.

Explicit references to debt sustainability are also made in several SGP provisions. In particular, as regards the MTO, the definition of the minimum threshold takes into account the debt ratio and sustainability risks. Furthermore, the adjustment path towards the MTO is more stringent for countries with a debt ratio above 60 per cent or pronounced debt sustainability risks. Lastly, a waiver from the convergence path towards the MTO is granted in the case of: i) an unusual event outside the control of the Member State which has a major impact on the financial position of the general government and does not endanger fiscal sustainability in the medium term; ii) periods of severe economic downturn in the euro area or the EU as a whole, provided that it does not endanger fiscal sustainability in the medium term; or iii) the full implementation of major structural reforms which have a verifiable impact on the long term sustainability of public finances.

a. For more details on the relevant formulas used in the implementation of the debt criterion, see European Commission (2016c).

4. The methodology adopted by the European Commission and its results

This section presents the methodology currently used by the European Commission to assess public debt sustainability, as well as the latest results published in the 2015 Fiscal Sustainability Report. This report analyses the sustainability of public finances in the euro area and the risks faced by Member States in the short, medium and long term.¹⁴ Results take into account the autumn 2015 European Commission forecasts and long term ageing cost projections published in the 2015 Ageing Report.

4.1. Short term sustainability

The analysis of short term fiscal sustainability challenges relies on an early warning indicator (S0), which identifies fiscal risks within a one year horizon. The S0 is a composite indicator made of a set of 28 variables classified under a fiscal sub-index and a financial-competitiveness sub-index.

The analysis of short term sustainability risks can be done at various levels. The overall assessment of risks requires comparing the S0 indicator with the threshold of 0.43,¹⁵ where higher values signal an increased vulnerability. Furthermore, even if overall risks are low, it is possible to identify specific sources of fiscal stress through the values of the sub-indexes or individual variables.

With regard to the overall assessment of short term risks in the euro area (Figure 4.1), the S0 indicator in 2015 is below the critical threshold for all countries. By comparison, in 2009 more than half of the euro area Member States were under short term fiscal stress. The figure also illustrates favourable developments across all countries compared with 2009, particularly in Portugal, where the value of the indicator declined the most. Currently, despite the S0 indicator taking the third highest value for Portugal, there is a substantial margin to the critical threshold.

^{14.} The Commission's report does not include countries under adjustment programmes at the time of the publication, more specifically, Cyprus and Greece.

^{15.} This threshold is calculated by maximising the model's signalling power during fiscal stress episodes. The same method is used to calculate critical thresholds, common to all countries, for both sub-indexes (0.35 in the case of the fiscal index and 0.45 for the financial-competitiveness index) and the 28 variables that make up S0. When analysing these variables, it should be recalled that their importance varies depending on their ability to correctly predict past fiscal stress. Appendix II lists the set of variables used and their results for Portugal considered by the Commission in the Sustainability Report.





FIGURE 4.1: Short-term indicator (S0) Source: European Commission.

FIGURE 4.2: Short-term sub-indexes Source: European Commission.

Figure 4.2 shows the values for both sub-indexes in 2009 and 2015. Once again clear favourable developments are visible. In 2015, none of these indexes signals risks to Portugal, or the remaining Member States, except for Ireland. In 2009, Portugal exhibited the highest fiscal risk among all Member States and fiscal stress arising from the financial-competitiveness side of the economy was also one of the highest.

4.2. Medium term sustainability

The European Commission assesses the existence of medium term sustainability challenges based on the joint use of two tools, the S1 indicator and the debt sustainability analysis tool (DSA tool). The latter makes use of a set of public debt projections over a 10-year horizon. This methodology includes projections in various deterministic scenarios: no-policy change, convergence to historical values and compliance with European commitments. The baseline scenario used is defined as a no-policy change scenario, according to which fiscal policy is assumed to remain unchanged as of the last forecast year, i.e. a constant structural primary balance from 2017 onwards. The remaining macroeconomic variables, which are relevant for debt dynamics (see Appendix I), correspond to the long run convergence assumptions agreed by the Economic Policy Committee. Deficit-debt adjustments are assumed to be zero after 2017. The sensitivity analysis is conducted by applying shocks to the interest rate and nominal GDP growth rate assumed in the baseline scenario. Lastly, the analysis also takes into account stochastic projections that produce a distribution of public debt paths, reflecting a large number of possible macroeconomic conditions. While for the overall risk assessment the relevant scenario is the no policy change scenario, the risk classification may be revised upwards based on the analysis of alternative scenarios, sensitivity tests and stochastic projections.

Risks underlying the baseline scenario are measured through three variables: the debt ratio at the end of the projections, the year in which debt peaks over the projection horizon and the percentile rank of the structural primary balance in 2017 relative to the historical distribution for all Member States. The first variable is the most relevant for the assessment: a debt ratio above 90 per cent presents high risks, while one below 60 per cent presents low risks. The other two variables only worsen this assessment when both point in such direction. The various scenarios taken into account in the report, including sensitivity tests, identify high risks in Portugal stemming from the fact that the debt ratio is above 90 per cent in the last year of projections. The most favourable projection is provided by the scenario where European commitments are met, while the most adverse paths are associated with scenarios where the structural primary balance reverts to historical values. Furthermore, stochastic simulations point to a relatively low probability of the debt ratio in 2020 exceeding that of 2015 (28 per cent).

As mentioned earlier, the medium term assessment also depends on the S1 sustainability indicator, which reflects the cumulated required adjustment in the structural primary balance over five years (starting from the year after forecasts, which is currently 2018), to reach a 60 per cent public debt-to-GDP ratio by 2030. For the S1 indicator, the considered thresholds are 0 and 2.5 per cent, after which a country is deemed to be at medium or high risk, respectively.

The S1 indicator can be broken down into the required adjustment given the initial budgetary position, the debt target requirement and the cost of ageing (Figure 4.3). The initial budgetary position is defined by the gap between the structural primary balance in the last forecast year and the debt-stabilising structural primary balance.¹⁶ The second component regards the required additional adjustment to reach a debt-to-GDP ratio of 60 per cent of GDP by 2030. Lastly, it is also necessary to calculate the supplementary effort related to the financing of age-related public spending.

Although there is high heterogeneity within the euro area, a substantial number of countries must make a consolidation effort to ensure sustainability of public finances in the medium run. Indeed, the S1 indicator signals average risks for the euro area as a whole. Portugal tops the group of eight high-risk countries, and needs a 4.7 p.p. adjustment between 2018 and 2022, which corresponds to a consolidation of approximately 0.9 p.p. per year. This is a direct result of the debt target requirement, given that 4.4 p.p. of fiscal consolidation is due to the gap between the debt ratio and the 60 per cent benchmark.

^{16.} The initial budgetary position also incorporates the additional effort stemming from the fact that the gradual adjustment (over five years) is higher than would be necessary if the adjustment took place fully in 2018.

The structural balance expected to be reached by 2022 (Figure 4.4) is obtained by adding the structural balance estimated for the last forecast year (2017) and the adjustment reflected by the S1 indicator. Although this is a purely mechanical exercise, Portugal and Italy must reach a structural primary balance above 6 per cent in 2022. However, only 1 per cent of structural primary balances among EU Member States in the 1980-2015 period reached this magnitude.



FIGURE 4.3: S1 sustainability indicator Source: European Commission.

FIGURE 4.4: Structural primary balance consistent with the S1 indicator Source: European Commission.

4.3. Sustainability in the long term

In the long term, the analysis is based on the S2 indicator, which reflects the adjustment of the structural primary balance required to meet the intertemporal budget constraint, taking into account ageing costs. This indicator measures the consolidation effort necessary to stabilise the debt ratio, but does not consider any specific target for that variable, i.e., the debt ratio may stabilise at very high levels. If this is the case, there is no guarantee that a crisis cannot be triggered, even though the sustainability conditions are met according to this long term indicator.

Portugal does not face long run sustainability risks, according to the S2 indicator that assumes that the structural primary balance is maintained constant at the 1.9 p.p. of GDP forecast for 2017 (Figure 4.5). The required structural adjustment is 0.7 p.p., i.e. 0.4 p.p. less than in the euro area. As

regards the structural primary balance consistent with the S2 indicator, a balance of 2.6 per cent of GDP is estimated for 2018. Indeed, the relative position of Portugal deteriorates slightly relative to the euro area, due to the estimate for the starting point, i.e. the forecasted structural balance in 2017 for Portugal is higher than in most other Member States. Expenditure on health and long term care related to the ageing population over the time horizon up to 2060 are the main drivers behind the required adjustment in Portugal, with a contribution of 1.9 p.p. that compares with 1.3 p.p. in the euro area. However, when adding pension and other expenditure (such as education and unemployment benefits) to these costs, Portugal is in the group of countries less vulnerable to fiscal pressures due to the ageing population.



FIGURE 4.5: S2 sustainability indicator Source: European Commission.

4.4. Summary of results

The Commission's assessment in the 2015 report, based on the abovementioned indicators, is synthetically presented in Table 4.1. According to this evaluation, Portugal does not face significant risks in the short and long term horizons. By contrast, in the medium term, risks are deemed to be high, as a result of both the DSA tool and the sustainability gap indicator (S1).

	Short-term (S0)	DSA tool	S1	Medium- term	Long-term (S2)
BE	Low	High	High	High	Medium
DE	Low	Low	Low	Low	Low
\mathbf{EE}	Low	Low	Low	Low	Low
IE	Low	High	High	High	Low
\mathbf{ES}	Low	High	High	High	Low
\mathbf{FR}	Low	High	High	High	Low
IT	Low	High	High	High	Low
LV	Low	Low	Low	Low	Low
LT	Low	Low	Medium	Medium	Medium
LU	Low	Low	Low	Low	Medium
MT	Low	Low	Low	Low	Medium
NL	Low	Medium	Medium	Medium	Medium
AT	Low	Medium	Medium	Medium	Medium
\mathbf{PT}	Low	High	High	High	Low
SI	Low	High	High	High	High
SK	Low	Low	Low	Low	Medium
FI	Low	High	High	High	Medium

TABLE 4.1. Overall assessment of fiscal sustainability Source: European Commission.

5. Discussions on debt and fiscal policy in Europe

5.1. The stabilising role of discretionary fiscal policy

In 2009, one year after the first signs of the outbreak of the economic and financial crisis, euro area GDP contracted for the first time since its inception. Since then, the European Commission estimates that the output gap in the euro area as a whole has been negative. According to the Spring 2016 Economic Forecasts, the European Commission anticipates that the output gap in the euro area will remain negative at least until 2017. However, this gap is expected to be significantly reduced, partly reflecting the effects of the projected fiscal policy stance (Figure 5.1). The persistence of this cyclical position and its downward effects on inflation re-launched the debate on macroeconomic stabilisation strategies and, in particular, on the combination of monetary policy and fiscal policy instruments leading to a narrowing of the output gap in the near future, without jeopardising public finance's sustainability.



FIGURE 5.1: Output gap in the euro area: 1999-2017

Source: European Commission, AMECO.

Note: In European Commission (2015) a 0.8 fiscal multiplier is assumed for all euro area countries. It should be noted that the analysis in Christiano *et al.* (2011), for instance, indicates that in a context of close to zero interest rates, the fiscal multiplier exceeds one.

Until 2008, monetary policy was viewed by most policy makers as the single instrument available for governments to mitigate the effects of business cycles on economic activity. Therefore, the role played by fiscal policy was, to a large extent, limited to the working of automatic stabilisers. After the outbreak of the economic and financial crisis, the European Central Bank (ECB) started to reduce the nominal interest rate, which reached historical lows, close to the so-called zero lower bound. The room for manoeuvre of decision makers to use monetary policy conventional instruments was thus limited. In this context, the need to resort to fiscal policy to supplement monetary stimulus effects assumed a prominent role in European discussions.

The relationship between economic cycles and fiscal policy is bilateral: on the one hand, fiscal policy responds to cyclical fluctuations and, on the other hand, it affects the actual output level and the cyclical position of the economy. This relationship may materialise through the functioning of automatic stabilisers or the implementation of discretionary measures. As regards automatic stabilisers, their capacity to mitigate the effects of strong cyclical fluctuations is usually insufficient and largely depends on the weight of the State on the economy (Fatas and Mihov, 2001).¹⁷ Regarding active discretionary fiscal policy, its stabilising role is typically associated with the

^{17.} Recent evidence in McKay and Reis (2013) indicates that, at least in the case of the United States, the ability of automatic stabilisers to affect the economic cycle is rather limited.

implementation of counter-cyclical measures. Indeed, an increase in public expenditure may stimulate the private sector of the economy, starting a sequence of induced effects involving a rise in income and private consumption. Also, a cut in the tax burden may result in an increase in disposable income and thus in private consumption.

Traditionally, the role of the discretionary component of fiscal policy is overlooked relative to monetary policy instruments. Firstly, the increase in public expenditure generates inflationary pressures that may lead to interest rate hikes, with an adverse effect on investment. Secondly, there are important implementation lags, particularly in decision-making and approval processes and also in terms of the practical implementation of measures. Moreover, even when economies recover their output levels, the reversal of stimulus measures may prove to be difficult. Finally, expansionary fiscal policies have implications as regards the sustainability of public finances in the long term. Therefore, even when monetary policy instruments are limited, fiscal stimulus must be considered with caution and its implementation must be timely, targeted towards a limited number of key variables, and temporary, so as not to jeopardise the sustainability of public finances (IMF, 2008).

The need to ensure fiscal discipline in the Economic and Monetary Union context was enshrined in the Maastricht Treaty, which established nominal ceilings for the deficit and public debt in Member States. The SGP has operationalised these rules and has strengthened fiscal discipline criteria, taking into account the effects of the cyclical fluctuations on the different fiscal variables. In particular, the fiscal policy stance in Member States must ensure, on the one hand, public finances' sustainability in the long term and, on the other hand, the possibility of macroeconomic stabilisation in the short term, leaving room for the implementation of discretionary measures and the working of automatic stabilisers.¹⁸ These objectives, however, are often difficult to reconcile.

Portugal, similarly to the euro area as a whole, recorded a decline in the output gap to negative levels and a deterioration in the fiscal balance in 2008. In 2009 and 2010, this deterioration was more marked, partly due to the impact of stimulus measures adopted within the scope of the European

^{18.} In the analysis developed in this text, the change of the structural primary balance is used to measure the fiscal policy stance, in line with the most common approach followed in, for instance, European Commission (2015). Recently, narrative approaches, which evaluate the magnitude of the discretionary effects based on the impact of fiscal policy measures (see, for instance Romer and Romer, 2010), and mixed methods combining both approaches (for instance, Carnot and de Castro, 2015 or European Commission, 2013) have also been suggested.

Economic Recovery Plan approved at the end of 2008, which translated into an expansionary and counter-cyclical stance of fiscal policy. From 2011 to 2014, Portuguese fiscal policy was more restrictive than in the euro area, reflecting the consolidation effort made during the period of the Economic and Financial Assistance Programme (Figure 5.2).



FIGURE 5.2: Fiscal policy stance in Portugal and in the euro area: 2011-2017 Source: European Commission, AMECO.

In 2015, according to the European Commission, fiscal policy in Portugal showed an expansionary stance, which is projected to continue until at least 2017 in the absence of additional consolidation measures (Figure 5.2). This orientation of fiscal policy contributes to closing the output gap. However, given the high public debt ratio, the expansionary nature of fiscal policy foreseen for the coming years implies risks to the sustainability of public finances.

Figure 5.3 assesses whether the fiscal policy stance in Portugal and in the other Member States may contribute to closing the output gap without undermining debt sustainability, on the basis of an exercise published in European Commission (2015). In particular, the figure compares the change in the structural primary balance (SPB) in 2016 estimated by the European Commission in the Spring Economic Forecasts with the change required to reduce the output gap by 50 per cent in 2016 and the debt ratio to 60 per cent of GDP by 2030. The magnitude of the bars in the figure represent a measure of the difficulty in reconciling both objectives.

In the euro area as a whole, the fiscal policy stance (measured by the change in the SPB), is expected to be slightly expansionary in 2016 (-0.5 p.p. of potential GDP), which seems to be consistent with a narrowing of the gap to a level close to half that estimated for the previous year. As regards the



FIGURE 5.3: Fiscal policy stance: short term stabilisation versus long term sustainability

Source: Authors' calculations, based on data from the European Commission; European Commission (2015).

Notes: (1) The change in the SPB consistent with the narrowing of the output gap by 50 per cent between 2015 and 2016 assumes a multiplier equivalent to 0.8. For further details, see European Commission (2015). (2) The change in the SPB in 2016 corresponds to the European Commission's estimates in its Spring 2016 Economic Forecasts. (3) The change in the SPB consistent with debt sustainability corresponds to $\frac{1}{4}$ of the S1 sustainability indicator calculated by the European Commission in the baseline scenario presented in the 2015 Sustainability Report (see Section 4). In the cases of Greece and Cyprus, it corresponds to the value of the indicator presented in European Commission (2015).

sustainability criterion, the policy stance is more expansionary than the change in the SPB consistent with a reduction in the debt ratio to 60 per cent of GDP by 2030 (0.5 p.p. of potential GDP).¹⁹ Although in the euro area as a whole the difference between both objectives does not seem to be significant, it reflects quite heterogeneous developments in individual Member States.

Given that the European Commission projects that in 2016 the output gap should continue to be negative in most euro area countries, a fiscal policy stance consistent with reducing it by half would typically be expansionary.

^{19.} The analysis presented in Figure 5.3 illustrates the change in the SPB consistent with the standard version of the S1 indicator corresponding to the base-scenario presented in the most recent Commission's Sustainability Report (European Commission, 2016b). In this case, the S1 indicator consists in the change in the SPB accumulated in the 2018-2022 period, required to bring the debt ratio down to 60 per cent of GDP by 2030. Since it is assumed that no adjustment will start in 2016, full comparability with the other indicators illustrated in the figure cannot be ensured. Nevertheless, their presentation makes it possible to assess the required fiscal effort underlying the debt sustainability criterion.

Countries with low public indebtedness and limited growth as regards costs related to ageing population have room for automatic stabilisers to work and to implement expansionary fiscal measures in order to close the (still negative) output gap. In turn, when countries face medium term sustainability problems, the reconciliation of both objectives is more difficult, chiefly in those cases where macroeconomic imbalances measured by the magnitude of the output gap are significant. Greece, Italy, France, and, to a lesser extent, Portugal, Austria, Finland and Belgium are in this situation.

5.2. Coordination of fiscal policies and non-standard solutions

Coordination of fiscal policies

As discussed in the foregoing sub-section, the current fiscal situation in Europe experiences a dilemma between the maintenance of public debt sustainability and economic stabilisation, interpreted in a strict sense as the utilisation of fiscal policy to promote the narrowing of the output gap.

The rules initially defined in the Maastricht Treaty are based on the assumption that the countries participating in a monetary union should maintain their sovereignty in conducting fiscal policy, as the fiscal surveillance mechanism set out in the SGP would prevent the accumulation of imbalances and the materialisation of the risk of unsustainable public finances. This institutional architecture was initially criticised on the basis of the literature of optimal currency areas, which focus the need to create fiscal federalism mechanisms and a true lender of last resort. However, the optimism arising from the implementation of a monetary union led, to a large extent, to the vanishing of these discussions from the European agenda. Such debates have resurfaced with the onset of the recent economic and financial crisis, making clear the seriousness of the systemic risk arising from the exposure of national banking systems to sovereign debt. Indeed, the negative impact of the decline in the price of public debt securities on banks' portfolios may result in the need for capital injections, which in turn augment the probability that public resources are channelled to this purpose, thus deteriorating fiscal prospects and creating a vicious cycle of rising the sovereign financing costs. In addition, the fact that some financial institutions required public support, together with the impact of the macroeconomic and fiscal framework, has worsened the sovereign debt situation, as perceived by financial markets.

Negotiations surrounding improvements in the EU's institutional architecture have made it possible to reach an agreement to increase the financial system soundness. Although important fragilities persist in some countries, the approval and start of implementation of the Banking Union should contribute to breaking the link between sovereign risk and bank risk. Progress regarding fiscal integration in the euro area, however, has been more limited. In this context, efforts were made to consolidate the fiscal governance framework, through the 'Six-Pack' and the 'Two-Pack', as well as the Treaty on Stability, Coordination and Governance. More recently, in the context of the Five Presidents' Report, discussions have considered the need for greater fiscal integration, which would allow the definition of an appropriate fiscal policy stance in the euro area as a whole, with a view to safeguard the sustainability of public finances and ensure the functioning of automatic stabilisers. In a first stage, this report discusses the creation of a European Fiscal Board, to allow for enhanced supervision and coordination of national fiscal policies. In addition, the report expresses the need to create, at a subsequent stage, a stabilisation function for the euro area, with a view to managing macroeconomic shocks that cannot be dampened exclusively by national automatic stabilisers. Nonetheless, it maintains the discussion open on the degree of fiscal integration to be achieved. Indeed, the mandate of the European Fiscal Board, defined in late 2015, establishes that this body shall be responsible for assessing the fiscal policy stance in the euro area as a whole. The creation of a joint fund ('fiscal capacity') at the euro area level, based on countries' contributions, should make it possible to cope with adverse shocks (particularly asymmetrical) without the respective fiscal deterioration, which occurs at the time the fund would be set up. Nonetheless, this type of mechanism may create perverse incentives and undermine the pursuit of sound fiscal policies and the implementation of structural reforms at national level. Finally, a fully-fledged fiscal union would also facilitate the definition of a euro area fiscal policy, although with loss of national sovereignty. The materialisation of these integration mechanisms requires time and detailed design, whose discussion extends beyond the scope of this Occasional Paper.

The restructuring of sovereign debt

At the EU level, discussions have been ongoing regarding the need to reduce debt levels in some Member States, in order to bring the economies back to a stable situation, reducing their exposure to interest rate risk or to a sharp deterioration of international economic activity. A first dimension of the debate revolves around the aspect of sovereign debt restructuring. Debt restructuring is the replacement of ongoing public debt, securities or loans, by new debt instruments or cash through a formal procedure. In this context, the following changes may occur: i) debt rescheduling, which may involve the extension of the deadline for contractual payments and/or an interest haircut, and/or ii) a principal haircut, implying a decrease in debt nominal value. Debt restructuring occurs frequently after default, but it is possible to carry out early procedures to reduce the risk of default.

Debt restructuring has occurred regularly both in advanced and emerging economies. The cases that have been mostly analysed in the literature are Argentina's (2001-2005), in a context marked by the effects of depreciations and debt issued in foreign currency, and Greece's (2012), in the single currency framework. The case of Argentina has been frequently referred to, due to legal disputes by debt holders who did not participate in the restructuring agreements. In this case, the "pari passu" (equal treatment) clause was understood by American courts as requiring pro rata treatment for all creditors, thus preventing Argentina from paying creditors that had agreed with restructuring, unless those that had opted out of the agreement would also be paid in full.²⁰ The Greek case is analysed in more detail in Box 3 of this Occasional Paper.

There is no single model for public debt restructuring. An analysis of the different episodes reveals that they differ not just in terms of the cause of the crisis, but also due to the conditions required, the percentage of creditors who have accepted the agreements, and the time taken by the countries to recover access to international financial markets. In fact, this may be one of the reasons why there is no structured international approach to this problem. In terms of the entities involved in the processes, public debt has typically been restructured through one or more of the following four channels: the 'Paris Club' (informal institution formed by 19 countries, whose purpose is to provide financial aid to countries facing economic difficulties); international institutions (such as the IMF and the World Bank); the 'London Club' (informal group formed by private institutions, usually banks, set up in response to a request for assistance from a given country); exchange offers (usually occurring when debt holders are widely dispersed).

The main disadvantage of a sovereign debt restructuring arises from reputational costs for the country in question, given that it generates uncertainty among creditors, and may lead to interest rate hikes in subsequent access to financial markets. If restructuring occurs after non-compliance with the commitments taken, the situation may be considered inevitable but the punishment by investors will probably be more serious than in the case of early restructuring. Still, investors' reactions are difficult to anticipate and, in the case of the euro area, there is an additional systemic risk associated with contagion effects between countries and the banking system. This is mentioned

^{20.} See Díaz-Cassou *et al.* (2008) for a comparative analysis of the Argentinian case and the following restructurings: Belize (2006-2007), Dominican Republic (2004-2005), Ecuador (1999-2000), Pakistan (1998-2001), Russia (1998-2001), Serbia (2000-2004), Ukraine (1998-2000) and Uruguay (2004).

in various documents to justify the initial approval by the IMF of a very high loan to Greece in $2010.^{21}$

In order to minimise uncertainty associated with the sovereign debt restructuring processes, several insolvency mechanism proposals have been advanced. These mechanisms differ from those adjusted to the resolution of liquidity crises, which may be covered by maturity extensions or funding during a transitional period. The European Stability Mechanism is an example of a liquidity mechanism currently operating in the euro area. There are a number of advantages related to the maturity extensions in the case of a liquidity (or solvency) crisis. In addition to reducing refinancing requirements, the creditor hierarchy remains unchanged, costs are allocated to a wide range of creditors and disruption is smaller, reducing contagion risks.

In 2013, Portugal benefited from a maturity extension (by seven years) as regards the European funding component of the adjustment programme, with a view to moderating the debt repayment profile and facilitating full access to the markets (see Figure 5.4). Until 2040, repayments related to the Programme total around \bigcirc 70 billion. Without the maturity extension, more than \bigcirc 40 million (approximately 64 per cent) were scheduled until late 2025. The new repayment profile has made it possible to reduce the latter amount to approximately \bigcirc 20 billion, corresponding to less than 20 per cent of the debt maturing in that period.²² In addition, it is possible to carry-out a simple exercise to calculate the value of interest saving, which reaches approximately 0.5 per cent of GDP within a 10-year horizon. This is due to the fact that these loans benefit from an average interest rate below the average for new issuances.²³ It should be noted that the interest rates of the new issuances are at historically low levels, namely as a result of the ECB's unconventional monetary policy²⁴, which limits savings associated with maturity extensions.

^{21.} In order to authorise the loan to Greece in the absence of a restructuring plan, the IMF Executive Board approved an addendum to the exceptional access conditions in 2010, authorising the waiver of the debt sustainability criterion due to the high risk of systemic effects at international level.

^{22.} After the extension of the maturities, most of the repayment amount envisaged until 2025 in the context of the Programme is a result of the loan from the IMF (84 per cent).

^{23.} The assumption underlying this calculation corresponds to a 3 per cent rate for refinancing operations (disregarding the effects of issuances with different maturities). The interest rate applied to the EFSF loan is calculated on a daily basis, in accordance with the financing pool. This calculation was based on an average rate around 1.9 per cent. EFSM loans have a fixed interest rate associated with each tranche, with an average rate of 2.8 per cent.

^{24.} For an estimate of the difference between market interest rates of Portuguese debt and those deemed consistent with macroeconomic fundamentals, see the Special Issue 'An interpretation of the low sovereign yields in the euro area', Economic Bulletin of Banco de Portugal, December 2015.



FIGURE 5.4: Medium and long term State debt repayment profile

Portuguese Treasury and Government Debt Agency (IGCP).

Notes: (1) The figure does not include redemptions of Treasury Bills, Saving Certificates, Treasury Certificates, *CEDIC* and *CEDIM*. (2) The final maturity of some EFSM loans has not yet been defined, and therefore a simulation made by the IGCP was used.

As regards insolvency mechanisms, three characteristics may be considered decisive for their effective operation. First, the events triggering the process must be well defined. In particular, the analysis of debt sustainability is frequently used for that purpose. Restructurings shall occur when actually necessary, and shall not be postponed or unduly brought forward. Second, it must minimise the amounts not involved in the process due to refusal of the holders who count on the full recovery of their debt ('holdout'), as they jeopardise the restructuring process and the mechanism itself.²⁵ Finally, it should be ensured that the implementation of the mechanism cannot be undermined, for instance, by the utilisation of other types of debt or amendments to the rules.

Among the main proposals for default mechanisms submitted since 2000, reference should be made to the IMF's in 2002 ('Sovereign Debt Restructuring Mechanism – SDRM') and the Bruegel Institute's in 2010 ('European Crisis Resolution Mechanism – ECRM'). Moreover, there is a more contractual perspective linked to the inclusion of clauses at the time of issuance of the debt securities, with a view to facilitating their restructuring, if needed.

^{25.} If the share of holders who do not agree with the restructuring terms is initially high, the other holders who had agreed to participate may decide not to do so, expecting to recover the full value of the debt. In these cases, there is a problem of collective decision that may prevent the operation, even if it was in the best interest of all.

This approach was based on the 'Collective Action Clauses' (CACs), which enable a qualified majority of creditors to impose the terms of the negotiation on the other creditors. In the euro area, CACs have been well received by investors, suggesting that market participants value the potential benefits of an orderly restructuring process more than the fact that these clauses may enable issuers to more easily repudiate debt. In 2014, the IMF started to recommend the introduction of a new voting system, allowing the decisions taken by the majority of creditors to apply to all bond issuances instead of a single issuance, in order to prevent strategic behaviours delaying or endangering the restructuring. In addition, this institution advises that the "*pari passu*" clause should not require proportional payment to all creditors, but only a similar ranking in legal terms. Recently, the Bundesbank published an article proposing several approaches which could contribute, in case of need, to orderly restructurings in the euro area (Bundesbank, 2016).

Issuance of European bonds

In the context of the sovereign debt crisis, alternatives have been proposed with the aim to solve the (ongoing and future) liquidity and solvency problems of some euro area Member States in a coordinated manner, thus avoiding recourse to debt restructuring. In this perspective, a debate started around the possibility of financing public debt through Eurobonds. In November 2011, the European Commission published a document ('green paper') assessing the possibility of joint issuance of bonds in the euro area ('stability bonds'), with the respective allocation of the associated income and cost flows. This document specified three approaches for the issuance of these bonds, depending on the degree of substitution (full or partial) of the issuances at national level and the nature of the underlying collateral (with or without joint collateral). In the most ambitious option – full replacement and joint collateral – the participating Member States would cease to have national issuances, which would require amendments to the Treaty and high moral hazard. In less far-reaching solutions, incentives to the lack of fiscal discipline would be fewer, particularly in the option without full collateral, which would also be consistent with the current no-bailout clause²⁶ of the Treaty²⁷.

^{26.} This provision is set out in Article 125 of the Treaty on the functioning of the EU as follows: '(...) A Member State shall not be liable for or assume the commitments of central governments, regional, local or other public authorities, other bodies governed by public law, or public undertakings of another Member State, without prejudice to mutual financial guarantees for the joint execution of a specific project.' (European Union, 2012).

^{27.} This approach is very similar to the issuance of bonds by the European Stability Mechanism, but with the advantage of also being used by countries not facing a crisis situation.

There are a number of advantages in the joint issuance of debt for the euro area. Firstly, Member States with higher public debt interest rates could benefit from a cut in spreads in their financing, through the effect of more solvent countries on market expectations. Secondly, the financial system in the euro area would gain stability and resilience to future adverse shocks, due to the existence of new liquid assets liable to be used as collateral. Thirdly, European bonds would be a large-sized and liquid instrument, with a single reference rate, thus benefiting efficiency in European sovereign and private debt markets, as well as the euro position in international markets. Finally, by facilitating the transmission of decisions to the bond market, monetary policy efficiency would improve.

However, the introduction of European bonds would imply significant challenges and requirements to be met. The creation of European bonds, irrespective of their comprehensiveness, would need to be accompanied by a substantial strengthening of fiscal supervision and coordination of policies, in order to minimise moral hazard and ensure the sustainability of public finances. In this case, the weakening of market discipline would be mitigated. In political terms, greater sharing of fiscal sovereignty, as set out in the European Commission's proposal, was the main driving factor behind its unfeasibility.

Box 3. Three experiences of debt reduction in the euro area

The sovereign debt crisis in the euro area was characterised by a very substantial increase in general government debt, with its ratio to GDP standing at 90.7 per cent in 2015 and five Member States posting figures above 100 per cent. This box illustrates the experience of three euro area countries that, starting from high levels, have markedly reduced their public debt ratio over the past three decades. It starts by looking at Belgium in the 1990s, which is often quoted as a successful fiscal consolidation experience (IMF, 2012).^{*a*} Subsequently, two recent debt reduction episodes are addressed in more detail: the Greek debt restructuring in 2012 and public debt developments in Ireland, in the period which followed the economic and financial assistance programme (Figure 1).



FIGURE 1: Public debt

Source: Eurostat.

Notes: (1) There is a break in the series in 1995 as until that year the European System of Accounts (ESA) 1995 is used, while from that point onwards data are compiled according to ESA 2010. (2) Data is not available for the euro area in the period prior to 1995. (3) Data for this aggregate are consolidated from intergovernmental lending in the context of the financial crisis.

Belgium: fiscal consolidation in a favourable institutional and financial environment

In Belgium, the public debt ratio decreased from 134.4 per cent in 1993 to 86.9 per cent in 2007, which corresponds to an average annual decrease of 3.4 percentage points (p.p.). The contribution of the primary balance stands out, reaching 4.9 per cent of GDP in annual average terms over this period (Figure 2). In this context, it is important to understand the institutional framework and the factors that may have contributed to these developments.

The consolidation process started in the early 1980s, and from the outset there was a strong consensus in the Belgian society regarding the need to maintain budgetary tightening in the medium term. However, during the initial consolidation period, despite a strong restraint in public expenditure and an improvement in the primary balance, the effect of the positive differential between the average interest rate on public debt and nominal GDP growth prevented a reduction in the debt ratio. Subsequently, the willingness to comply with the Maastricht criteria for adopting the single currency strengthened the consensus on the need to reduce fiscal imbalances.

The maintenance of substantial primary balances for a long period of time benefited from multi-annual consolidation plans with ambitious targets. In 1994 a medium term benchmark for the primary budgetary balance was set at 6 per cent of GDP. Furthermore, clear rules were adopted regarding developments in the main fiscal variables in order to achieve this target, ^b and agreements were periodically signed with all levels of government. The fiscal consolidation strategy also included a widespread institutional reform. This reform included the reinforcement of the High Council of Finances' (HCF) advisory role from 1989 onwards, and the establishment of the National Accounting Institute in 1994, with the purpose of improving the production of statistics and providing macroeconomic forecasts to be used in the preparation of the budget. It is important to highlight that the efforts to improve the primary balance were mostly concentrated in the first years of the period in analysis. In fact, fiscal policy was essentially expansionary between 2001 and 2007, which would have had a noticeable impact on the primary balance, if several operations with a positive temporary impact on this indicator had not been conducted (European Commission, 2012 and Central Bank of Belgium, 1993-2007).

In addition to primary balance developments, the denominator effect of nominal GDP growth was also important to the reduction of public debt in Belgium, with an annual average contribution of 4.5 p.p. Amid inflation rates close to 2 per cent, real GDP in Belgium grew, on average, 2.5 p.p., slightly above that for the euro area as a whole in the period between 1994 and 2007.

Still regarding the factors that contributed to debt ratio developments, the ratio of interest expenditure to GDP declined very significantly, from 9.5 per cent in 1994 to 4.0 per cent in 2007. A similar reduction occurred in several euro area countries in the period before the introduction of the single currency. In Belgium, this effect seems to have been amplified by the gradual debt stock reduction and by the country's credibility in financial markets.^c

Lastly, deficit-debt adjustments were relevant during the 1990s, when several debt-reducing operations were conducted, most notably, privatisations. However, in accumulated terms, deficit-debt adjustments do not seem relevant, given that other effects subsequently contributed to an increase in debt, namely the classification of new entities within the general government sector.

Greece: restructuring reduced the debt ratio and dampened the dynamic effect

In 2010, Greece was the first euro area country to resort to an international assistance programme in the wake of the financial crisis.

The first years of this programme did not lead to a reversal of the strong upward trend in the public debt ratio that had started in 2009. Indeed, it reached 172.0 per cent by $2011.^d$ In the absence of any prospects of rapid stabilisation, it became clear that debt restructuring would be unavoidable (IMF, 2011), and a plan called "Private Sector Involvement" (PSI) implemented a Greek debt restructuring in March 2012. This plan involved a debt exchange below its nominal value, making it possible to cut debt held by the private sector by around 60 per cent.^e Although this operation achieved a 96.9 per cent participation rate on eligible debt and it was publicly presented as a voluntary exchange of debt securities, the International Swaps and Derivatives Association declared a triggering credit event. However, contagion from credit default swaps (CDSs) was not substantial, given that exposure to these instruments had declined significantly. In addition to this this operation, the Greek government agreed with European institutions the extension of maturities, the reduction of interest on loans, and that profits made by the ECB on Greek debt would be transferred back to the country. Furthermore, in November 2012, Greece announced a buyback of debt securities (Zettelmeyer et al., 2013).

The direct effect of this restructuring on the debt ratio was above 50 p.p. However, support from the European Financial Stability Facility was necessary to recapitalise Greek banks highly exposed to public debt, and deposits held by the general government were increased as a precautionary measure. Indeed, the deficit-debt adjustment in 2012 reached 35.6 per cent of GDP (Figure 3). It is important to note that these operations implied a substantial reduction in interest rates on public debt.^f Given the magnitude of debt reduction, the high participation rate and limited financial market disruptions, the PSI was deemed generally successful. After a further increase in the debt ratio in 2013, chiefly due to the primary deficit and to a contraction in nominal GDP, in 2014 and 2015 the debt ratio was relatively stable, although at a very high level (176.9 per cent in 2015).

Ireland: economic growth and the sale of financial assets contributed to debt reduction

In 2011 Ireland was the second euro area country to resort to an economic and financial assistance programme, in the wake of the international financial crisis that triggered the collapse of the real estate sector and led to the channelling of a large amount of public resources to stabilise the banking sector. The Irish debt ratio, which was one of the lowest in the euro area (23.9 per cent in 2007), rose to 109.3 per cent in 2011. During this period, in addition to the effect of the assistance provided to the financial sector, the economic recession also contributed to the severe deterioration in the fiscal deficit, which reached 29.3 per cent of GDP in 2010. g

Unlike Greece, the differential between the interest rate and nominal GDP growth did not have a very significant impact on the growth dynamics of the Irish public debt ratio. In this context, a broadly balanced primary balance in 2013 was enough to stabilise the debt ratio. In the following year, this indicator declined substantially (-12.5 p.p.), mainly due to the effect of negative deficit-debt adjustments (10.3 p.p.), related to the liquidation of the Irish Bank Resolution Corporation^h and the sale of its credit portfolio to the Bank of Ireland (-6.2 p.p.), and the reduction of the amount of deposits held by the general government (-3.1 p.p.) (Figure 4).

Conversely, in 2015 the reduction in the debt ratio (-13.8 p.p.) resulted mainly from the denominator effect associated with an improvement in economic activity (-12.8 p.p.). Note that there is still some room for debt reduction through the sale of financial assets over the next few years, given that the general government's stakes in domestic banks in 2015 where valued at about 8.8 per cent of GDP(European Commission, 2016a), and the public sector holds 49 per cent of the National Asset Management Agency, which absorbed problematic assets associated with real estate and has achieved positive results in their management.



FIGURE 3: Breakdown of public debt changes in Greece in 2009-15 Sources: European Commission and Banco de Portugal.

FIGURE 4: Breakdown of public debt changes in Ireland in 2009-15

Sources: European Commission and Banco de Portugal.

a. Over the same period, the Italian and Irish episodes would also be a relevant case study. In the first country, the reduction was less substantial, while in the second the debt ratio was lower.

b. These rules included tax revenues growth at least in line with nominal GDP; growth in federal primary expenditure, excluding EU transfers, not exceeding inflation; and a balanced budget in the social security system, with a threshold of 1.5 per cent health expenditure growth.

c. The implicit interest rate on public debt, calculated as the ratio of interest expenditure for the year and the simple average of the debt stock at the end of the year and the end of the previous year, declined from 7.3 per cent in 1994 to 4.6 per cent in 2007.

d. In fact, in 2009 and 2010, this ratio increased by 23.6 p.p., chiefly due to high fiscal deficits, with a cumulated contribution of 15.5 p.p. In turn, over the two following years, the debt ratio rose by 45.3 p.p., mainly on account of the deepening economic recession (19.9 p.p. contribution), given that primary deficits were lower (8.4 p.p. contribution).

e.~ This plan excluded debt held by the ECB, other national Central Banks and the European Investment Bank.

f. The implicit interest rate on public debt, calculated as explained in footnote c, decreased from 4.4 per cent in 2011 to 2.9 per cent in 2012.

g. The direct effect of financial sector assistance, between 2009 and 2014, increased Irish debt by 22.6 per cent of GDP, and the bulk of this effect had a direct impact on the primary budget balance (European Central Bank, 2015).

h. The IBRC was set up in 2011 and resulted from the merger of the Anglo Irish Bank and the Irish Nationwide Building Society. It was classified under general government.

5.3. The effects of low inflation on fiscal indicators

The discussion on the effects of price developments on the budget balance and the public debt ratio has become very relevant in the current low inflation environment. The impact of inflation rate developments on the fiscal situation in any given year largely depends on the degree in which shocks are expected and the prevalence of indexation mechanisms.²⁸ In principle, shocks anticipated by governments should be neutral from a fiscal point of view provided that policy decisions allow for a proper adjustment in revenue/expenditure levels and that all variables are perfectly indexed to inflation. Unanticipated developments, by contrast, affect balances given that they impact public revenue and expenditure differently. The European Commission (2015) conducted an exercise to gauge the fiscal impact of the unanticipated negative inflation shock in the euro area in 2014.²⁹ According to this exercise, a negative shock equivalent to 1 p.p. on the 2014 inflation rate resulted in a deterioration of around 0.1 p.p. of GDP in that year's euro area budget balance.

Indeed, negative inflation shocks may lead to a temporary deterioration in primary balances. While their effects on revenue are rapidly passed through,

^{28.} End *et al.* (2015), which focuses on deflation scenarios, systematises the channels through which price fluctuations affect fiscal variables.

^{29.} Developments in the Harmonised Index of Consumer Prices in 2014 stood below those projected in the autumn 2013 European Commission forecast for all Member States. In some cases (more specifically, Spain, Cyprus, Greece, Portugal and Slovakia), deflation actually materialised in 2014. Only in the case of Greece had such developments been anticipated.

the nominal cuts in public expenditure that would follow a price decrease are difficult to implement. This is due to the nominal nature of expenditure set in budgetary procedures and the rigidity created by the limits to the indexation of wages and social benefits and by demographic trends. With respect to expenditure related to debt service, the effect of price deceleration largely depends on its composition in terms of maturity and the share indexed to inflation. The larger the share of public debt composed of short term variable rate securities, the greater the sensitivity of debt servicing to price fluctuations (Akitoby *et al.*, 2014). According to European Commission (2015), in the euro area as a whole the share of debt reacting to inflation amounts to approximately 30 per cent of total stock, ranging from 5 per cent (in the case of Luxembourg) to around 40 per cent (in the case of Italy). Therefore, the magnitude of the effects of price deceleration in a given economy tends to vary considerably across countries.

With regard to the debt dynamics equation (Appendix I), the impact of economic growth is also relevant for developments in the public debt-to-GDP ratio. In particular, given the relative rigidity of the debt burden and the decrease in the nominal GDP growth rate associated with disinflation environments, *ceteris paribus*, the so-called 'dynamic effect' should be positive, thus deteriorating the primary balance even further. As such, in the absence of deficit-debt adjustments, a low inflation scenario tends to lead to an increase in the debt-to-GDP ratio to a larger extent than that stemming from the denominator effect associated with lower nominal GDP growth. Indeed, according to the results of simulations published by the European Commission (2016b), negative inflation shocks, even if limited, have a non-negligible impact on public debt sustainability, particularly in countries with a high debt-to-GDP ratio.

It is worth considering the possible implications of the current low inflation scenario in terms of the SGP. The rules underlying the SGP were established based on the assumption of price stability, which is considered to be an inflation rate of below, but close to, 2 per cent. Both under its preventive and corrective arms, the main indicators used to assess compliance with fiscal rules are the nominal budget balance and the structural balance. As outlined above, unanticipated negative shocks on inflation tend to lead to a deterioration in the effective budget balance. Given that the cyclical component of the budget balance is not influenced by price fluctuations, structural balances will also be adversely affected, both in terms of level and change. Compliance with the convergence path or the maintenance of MTOs is therefore hindered. Similarly, the 'adjusted structural balance', which is relevant under the corrective arm of the SGP, also tends to be adversely affected by lower price growth.³⁰

There are also implications regarding the expenditure rule, which is used in both the preventive and corrective arms of the SGP. This rule establishes that, should expenditure grow more than potential GDP, in average terms, this growth must be offset by discretionary revenue measures. In the case of the preventive arm, this rule is relevant when assessing significant MTO deviations or the adequate path towards it. As regards the corrective arm, this is one of the factors used in the analysis of effective action, together with actual and adjusted fiscal efforts and discretionary measures adopted. Therefore, if lower price growth negatively impacts public expenditure developments, it becomes easier to comply with the expenditure rule. However, given the aforementioned rigidity, its implications are typically limited.

As described in Box 2, following the 2011 reform, the SGP was broadened to formalise the debt criterion. When assessing compliance with this rule, none of the three criteria used takes into account the implications of price fluctuations. As such, the negative impact of the denominator effect and the deterioration in the primary balance make compliance with the debt rule more stringent. In the case of Member States within the transition period, the effect of negative inflation shocks on the structural adjustment may also hamper compliance with this rule.

6. Final remarks

This Occasional Paper aims to address, in an integrated manner, the various aspects of the discussion on public debt sustainability, with a particular focus on the Portuguese case and on the constraints associated with the institutional and economic environment in the euro area. In this respect, the text approaches the concepts and methodologies used to assess sustainability, lists the existing assessment rules for euro area countries, presents its results for Portugal and refers to the main ongoing discussions on high debt levels.

Public debt sustainability is a complex topic and there is no consensus in the relevant literature on the best methodology for its assessment. The regular analysis conducted by the authorities that monitor the fiscal situation in Europe are based on simulated scenarios for debt developments and on the necessary conditions for its stabilisation. The mechanical nature of these exercises and

^{30.} The 'adjusted structural balance' corresponds to the structural balance adjusted for any revisions to potential GDP growth forecasts and unexpected changes in revenue compared with the recommendation given in the context of the EDP.

the strong dependence on *ad-hoc* assumptions, create substantial fragilities in the analysis. However, alternative methods have yet to provide sound solutions that are easy to convey to the public and decision-makers. Therefore, research in this field should proceed, and it is also important to learn from past policy errors.

Throughout this Occasional Paper, the discussion on public debt sustainability was broken down into concerns regarding conditions to be put in place to minimise sustainability risks and solutions that must be adopted when such problems materialise. As regards the conditions to minimise sustainability risks, it is important to highlight the operation of fiscal surveillance mechanisms in the EU. Undoubtedly, efforts have been made to improve this set of fiscal rules and to promote the implementation of best public accounts management practices for Member States. However, the great complexity of rules and procedures together with their repeated revisions, which were conducted in times when targets were difficult to meet, contributed to reduce the effectiveness and the credibility of this fiscal surveillance mechanism.

Another mechanism that may help ex-ante to prevent unsustainability episodes and the materialisation of fiscal crises is the proper functioning of sovereign debt markets. The timely signalling of fiscal imbalances via increased risk premia may dampen the excessive accumulation of public debt. However, the lack of an insolvency framework for Member States limits the effectiveness of this correction mechanism, given that investors build expectations that the costs of crises will fall on other Member States or taxpayers. This moral hazard issue tends to be less severe if there are orderly restructuring mechanisms that allow for continuous and proper sovereign debt market price-setting.

The costs arising from fiscal crises are extremely high for the countries involved and, as such, there are always risks of an excessive delay in recognizing fiscal crises and ensuing action. Furthermore, challenges associated with the prevention of fiscal crises and their resolution tend to be perceived as being greater in monetary unions, not only because it is assumed that there are strong externalities upon other Member States, but also because there are fewer macroeconomic policy instruments available to governments. However, as mentioned in this Occasional Paper, a substantial reduction in public debt has been achieved in some euro area Member States.

Recent academic and institutional discussions about public debt sustainability and the deepening of the monetary union, as pondered by the presidents of the main European institutions (Juncker *et al.*, 2015) are likely to lead to proposals to remedy the current sustainability issues faced by a number of countries. In addition, this discussion may improve the mechanisms that help to substantially reduce the emergence of further risks. Both aspects are important and the informed discussion among political and social forces in the various Member States will certainly lead to the best solutions. Nevertheless, the crucial role played by sustainable national fiscal policies, based on a proper institutional framework and aimed at greater quality and efficiency in the allocation of public resources, must not be overlooked.

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Appendix I: Derivation of the debt dynamics equation

Starting from the government's short term budgetary constraint and after isolating interest expenditure, we get:

$$(B_t - B_{t-1}) = (E_t - R_t) + DDA_t \Leftrightarrow B_t - B_{t-1} = PE_t + i_t B_{t-1} - R_t + DDA_t \Leftrightarrow B_t = -(R_t - PE_t) + (1 + i_t)B_{t-1} + DDA_t$$
(I.1)

where

 B_t is the public debt stock at time t R_t is the public revenue at time t E_t it the public expenditure at time t PE_t is the primary expenditure at time t DDA_t is the amount of deficit-debt adjustments at time t i_t is the (nominal) implicit interest rate on public debt at time t.

By rearranging and dividing both sides by nominal GDP, we get:

$$\frac{B_t}{Y_t} = -\frac{PB_t}{Y_t} + \frac{(1+i_t)B_{t-1}}{(1+y_t)Y_t} + \frac{DDA_t}{Y_t} \Leftrightarrow \beta_t = \delta_t + \frac{(i_t - y_t)}{(1+y_t)}\beta_{t-1} + dda_t$$
(I.2)

where

 PB_t is the primary balance at time t Y_t is nominal GDP at time t y_t is the rate of change in nominal GDP at time t β_t is the debt ratio at time t δ_t is the primary deficit as a percentage of GDP at time t dda_t are the deficit-debt adjustments as a percentage of GDP at time t.

By subtracting β_{t-1} to both sides of Equation (I.2) and rearranging them, we get the debt dynamics equation:

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$$\Delta \beta = \delta_t + \underbrace{\frac{i_t}{(1+y_t)} \beta_{t-1}}_{\text{Interest effect}} \qquad - \underbrace{\frac{y_t}{(1+y_t)} \beta_{t-1}}_{\text{Economic growth effect}} + \qquad dda_t \Leftrightarrow$$

$$\Delta \beta = \delta_t \qquad + \underbrace{\frac{(i_t - y_t)}{(1 + y_t)} \beta_{t-1}}_{\text{"Snowball" or dynamic effect}} + dda_t$$

Appendix II: Composition of the S0 indicator (2015)

Percentage of GDP	$\mathbf{Portugal}^{2}$
Fiscal variables	
Budget balance	-3.0
Primary balance	2.0
Cyclically adjusted balance	-1.8
Debt-stabilizing primary balance	1.0
Public debt	128.2
Change in public debt	-2.0
Short-term public debt	16.9
Net public debt	120.6
Gross financing needs	13.9
Interest rate-growth rate differential	0.8
Change in total expenditure of general government	-3.8
Change in public consumption	-0.4
Old-age dependency ratio, 2035	49.0
Change in age-related expenditure	0.2
Macroeconomic and financial variables	
Yield curve	2.3
Real GDP growth rate	1.7
GDP per capita, PPP (% of USA GDP)	52.5
Net international investment $position^1$	-113.3
Net savings of households ¹	-1.5
Private sector debt ¹	189.6
Private sector credit flow ¹	-8.7
${ m Financial\ sector\ leverage}^1$	4.0
Short-term debt of non-financial corporations 1	24.4
Short-term debt of households ¹	3.2
Construction, $\%VAB^1$	4.5
$\operatorname{Current} \operatorname{account}^1$	0.0
${\rm Change \ of \ real \ effective \ exchange \ rate}^1$	-0.4
Change in nominal unit labour $costs^1$	-2.3

Source: European Commission.

Notes: (1) These variables are taken in lagged values. (2) These figures correspond to the estimates considered by the Commission in the Sustainability Report. (3) Figures in the shaded areas exceed the respective critical thresholds.



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01|16 Public debt sustainability: methodologies and debates in European institutions

João Amador | Cláudia Braz | Maria M. Campos | Sharmin Sazedj | Lara Wemans

