

# **Managing public debt in Europe: an introductory guide**

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**Sotiria Theodoropoulou**

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# Contents

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Introduction .....	5
<b>1. The basics .....</b>	<b>9</b>
1.1 What does public debt consist of? .....	9
1.2 What is a government bond and where/how can it be bought? .....	9
1.3 How does a government service its debt? What is the debt rollover? .....	10
1.4 What determines the price and interest rate of government bonds? Are the two related and, if so, how? Do they matter and, if so, why? .....	10
<i>Key fact:</i> The lender of last resort to governments .....	12
<i>Focus:</i> Credit rating agencies .....	14
<i>Key fact:</i> Market perceptions and the interest rate .....	15
1.5 Why do we measure public debt as a share of GDP? Is this the best measure to use? .....	15
<i>Focus:</i> The case of Japan .....	15
<i>Key fact:</i> The level of public debt and the risk of default .....	16
1.6 Who holds the public debt of a country? Does it matter? Is it easy to locate? .....	17
1.7 How does the public debt/GDP increase/decrease? .....	18
<i>Focus:</i> The EU fiscal rules and their recent reforms .....	19
<b>2. Public debt, growth and crises .....</b>	<b>23</b>
2.1 What determines the evolution over time of the public debt/GDP ratio? .....	23
<i>Key fact:</i> The determinants of the public debt/GDP ratio over time .....	24
2.2 Are the factors upon which the evolution of public debt/GDP depends related and if so, how? .....	25
<i>Focus:</i> The fiscal multiplier .....	26
<i>Focus:</i> Expansionary austerity .....	26
2.3 When does a government face a liquidity crisis and when does it face a solvency crisis? What can lead to each of these situations? .....	28
2.4 Does all this mean that membership of the eurozone can only be bad for public finances? .....	29
2.5 When is the request for a bail-out from international organisations necessary? .....	29
2.6 Is high public debt a problem? If so, why? .....	30
2.7 What is the relationship, if any, between (high) public debt and output growth? .....	31
2.7.1 Can public debt be too low? .....	32

<b>3. Options for managing public debt: their advantages and disadvantages.....</b>	<b>33</b>
3.1 How has high public debt been reduced in the past? What does historical experience suggest? .....	33
3.2 Remediating the institutional incompleteness of the EMU .....	34
3.2.1 Common bonds in the eurozone.....	34
3.2.2 A Euro Treasury (Bibow) .....	36
3.2.3 Establishing a banking union .....	37
3.3 Sovereign debt default.....	38
3.3.1 What are the costs and benefits of defaulting on public debt?.....	38
3.4 Debt auditing .....	40
 Annex 1	
Definitions of government budget deficit.....	42
 Annex 2	
What determines the evolution over time of the public debt/GDP ratio? A more formal analysis.....	43
 Glossary of terms.....	44
 References .....	47

# Introduction

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Public debt as a share of GDP has risen in almost all Member States of the EU since 2007, when the global financial crisis began (see Figure 3 below, p. 16). At the time, the magnitude of the crisis prompted policymakers in Europe and the US, with the policy lessons from the Great Depression of the 1930s in mind, to increase public spending (that is, to deliver a fiscal policy stimulus) in a concerted manner. This coordinated effort resulted in higher budget deficits and public borrowing but also prevented the recession that followed on from the financial crisis from becoming another depression.

The financial crisis of 2007 also exposed the flaws in the institutional construction of the eurozone. Starting with Greece, the governments of individual Member States in the so-called eurozone 'periphery' discovered the consequences of having joined a single currency managed by a central bank that was supranational rather than national, without any form of common (that is, eurozone) fiscal authority and resources. Following years of extreme risk-taking in a context of financial integration and deregulation, in the wake of the financial crisis of 2007-8 actors in the financial markets became more risk-averse and started lending and investing much more cautiously. In autumn 2009, the revelations that the Karamanlis Greek government had been concealing the true state of Greece's public finances, which was far worse than suspected, triggered a considerable sense of mistrust towards the Greek government. The interest rate at which it could borrow in the markets started rising (see Figures 1 and 2, p. 11 and 13 respectively), making it increasingly expensive to borrow in order to keep on servicing its debt. Fears emerged that the Greek government was likely to soon default on its debt obligations (payments), further fueling the rising interest rates.

If Greece had had its own central bank, such a case of reduced confidence in the capacity of the government to continue honouring its debt obligations would have at least been mitigated: the Greek (or any national) central bank would have been seen as a 'lender of last resort' to the Greek government and reassured investors in the financial markets that there would always be someone willing to buy Greek bonds. This was not the case with the European Central Bank (ECB). In the early years of the financial crisis, the ECB readily provided banks with liquidity, acting as their lender of last resort. However, buying troubled governments' bonds was a taboo. The EU Treaties forbid the ECB from buying the debt of national governments, for fear of creating inflation. Moreover, there were concerns that if the ECB bought the bonds of a government whose public finances were not sustainable, it would have to bear losses in the case of default, which would then be shared by all Member States that back the ECB. The realisation that the ECB was not a lender of last resort to any of the eurozone governments resulted in increased fears about the capacity of other governments in the eurozone periphery to continue honouring their debts.

Soon, the governments of Spain, Portugal, but also Ireland started facing rising interest rates too. In the cases of Spain and Ireland, countries with some of the lowest public debt as a share to GDP prior to the crisis, the problems began when their governments tried to rescue banks in their territory which had been caught up in the storm of the financial crisis. As there was no banking union in the eurozone which could offer pooled resources to that end, national governments had to intervene alone to save banking institutions. Failure to rescue these ailing banks would have had consequences beyond national borders. The EMU and financial integration had resulted in many interconnections between banks across Member States. Failing banks in one Member State were unlikely to leave financial institutions in other Member States unaffected.

The eurozone Member States reluctantly organised bailouts for those members whose governments faced problems refinancing their debt in the financial markets. In the absence of established institutions for that purpose, these financial support schemes had to be approved by national parliaments. Strict conditionality programmes were attached to them and harsh fiscal austerity was one of the main pillars of the adjustment process. The fact that Greece, with its failure to rein in its rising public debt prior to the crisis, was the first country to be drawn into the debt crisis, combined with the reluctance in several Member States to bail out others, resulted in the portrayal of the sovereign debt crisis in the eurozone as primarily the result of ill management of public finances, turning it into a morality tale. While this was true in the case of Greece, it was in fact the institutional incompleteness of the eurozone, together with the ECB responses of the first few years, that failed to avert an episode of reduced investor confidence from becoming a fully-fledged and contagious crisis, which at times touched even Italy. Italy saw its interest rates rise, not because the Italian government had higher budget deficits but because it had a chronically high public debt as a share of its GDP.

The lessons drawn in the early years were therefore that public finances needed to be controlled better and fiscal rules tightened. Faced with the spreading of the

crisis in bond markets, the EU fiscal policy guidelines turned away from stimulus and urged national governments to reduce their budget deficits even though it was far from clear whether the recession in the aftermath of the financial crisis was over. Moreover, a series of reforms of the fiscal rules were introduced in the EU, namely the Six Pack, the Two Pack and the Fiscal Compact, aimed at strengthening both the preventive and the corrective arms of fiscal rules by giving more powers to the European Commission to propose penalties and by limiting even further the capacity of national governments to use public spending and taxes with more discretion and beyond their function as automatic stabilisers. The Fiscal Compact imposed additional restrictions on the lowest bound of the structural budget balance for Member States whose public debt/GDP ratio was above 60%. Not surprisingly, the eurozone plunged into a second recession after 2011, and by 2015 output had yet to reach its 2008 level in many Member States. Meanwhile, as Figure 3 (below, p. 16) suggests, public debt/GDP ratios did not improve commensurably to the austerity efforts. The eurozone crisis has left many Member States with higher public debt/GDP ratios than before, and most mainstream economists, including those at the IMF, understood already in 2013 that cutting public spending at a time when economies are going through a recession can only deepen this recession and prove counterproductive for reducing the debt/GDP ratio.

Economists have expressed concerns about how these high debt levels will be reversed. On the one hand, the risks of further crisis eruptions have not been eliminated and will continue to be present for as long as some critical steps towards strengthening the eurozone institutional architecture are not taken. Should further crisis episodes occur, then having the fiscal space to act will be important. On the other hand, in the face of weak output growth for the foreseeable future, going too fast into producing the surpluses necessary for reversing high public debt/GDP ratios has only further weakened growth and recovery. This guide aims at reviewing the debate and empirical evidence on the problems that high public debt may cause and the policy options for reversing it. To do that it first explains the basics regarding the determinants of the evolution of public debt over time, before going on to assess the policy options later in the report.



# 1.

## The basics

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### 1.1 What does public debt consist of?

Government debt is the stock of government bonds that have been sold to the private sector in the past (Carlin and Soskice 2015: 516-517) and are still outstanding. This debt reflects the borrowing that has been undertaken over the years in order to finance the expenditure plans of a government that are not covered by tax revenues, and to pay the interest on previous loans.

### 1.2 What is a government bond and where/how can it be bought?

A government bond is a financial instrument (traditionally a piece of paper, currently an electronic title) that a government sells when it wishes to borrow from investors that wish to lend (as a form of investment). When a government issues a bond, it makes a promise to repay the principal (that is, the amount that it borrows when it issues the bond) after a certain number of months or years and to pay out a specific amount of money (interest) regularly to the lender for a specific amount of time (the duration of the bond). This regular fixed amount of money to be paid to the lender/holder of the bond until its expiration is called the 'coupon'. Coupons are fixed for a given bond. Given the fact that bonds can be sold and generate benefits for those who own them, they are assets.

When a bond is first issued, it is usually sold through a registration process managed by financial institutions (usually investment banks). Once a bond has

been issued, then it can be sold and bought in the bond market. In other words, the original buyer of the bond (who initially lent money to a government) may subsequently sell that bond in the bond market. Loans obtained by a bank cannot be traded in the same way as bonds. To be more precise, bonds are traded (after their initial issuance) in the *secondary* bond market. A *primary* bond market is the one in which bonds are first issued/bought. This is an important distinction between bond markets to bear in mind when thinking about the interventions of the ECB. The ECB is not allowed by the Maastricht Treaty to buy government bonds when they are first issued by governments (that is, in the primary market). However, during the crisis, the ECB (and other central banks in the western world) have embarked on government bond purchases in the *secondary* bond markets (De Grauwe 2014: 165-166).

### **1.3 How does a government service its debt? What is the debt rollover?**

Servicing a government's debt means that the government pays back the coupon (interest), promised by the bonds it has issued, at the designated time, as well as the principal (that is, the money borrowed) when a bond expires. This does not mean that every time that a bond expires, the government's debt is reduced by that amount. Governments reduce their debt by making sure that in a year's time, their revenues are larger than their expenses. When bonds expire or when coupons need to be paid, governments very often borrow again to make the necessary payments and thus renew their debt. This is called a *debt rollover*.

The practice of debt rollover can explain why the price and interest rate at which government bonds are sold and bought after they have been initially issued (that is, in the (secondary) financial markets) are important. Given that governments also need to borrow to roll their debt over, if interest rates are high, borrowing will be more expensive. If a government cannot roll its debt over at an affordable interest rate, then, barring external financial support (for example, a bailout by the IMF), it has two options: it will either have to increase its revenues accordingly, relative to its expenses, and thereby pay its obligations through this surplus; or alternatively, it may renege on its promise to pay back the capital borrowed through the bonds or interest at the specified times, thus defaulting on some of its debt (see also section 3.3 'Sovereign debt default').

### **1.4 What determines the price and interest rate of government bonds? Are the two related and, if so, how? Do they matter and, if so, why?**

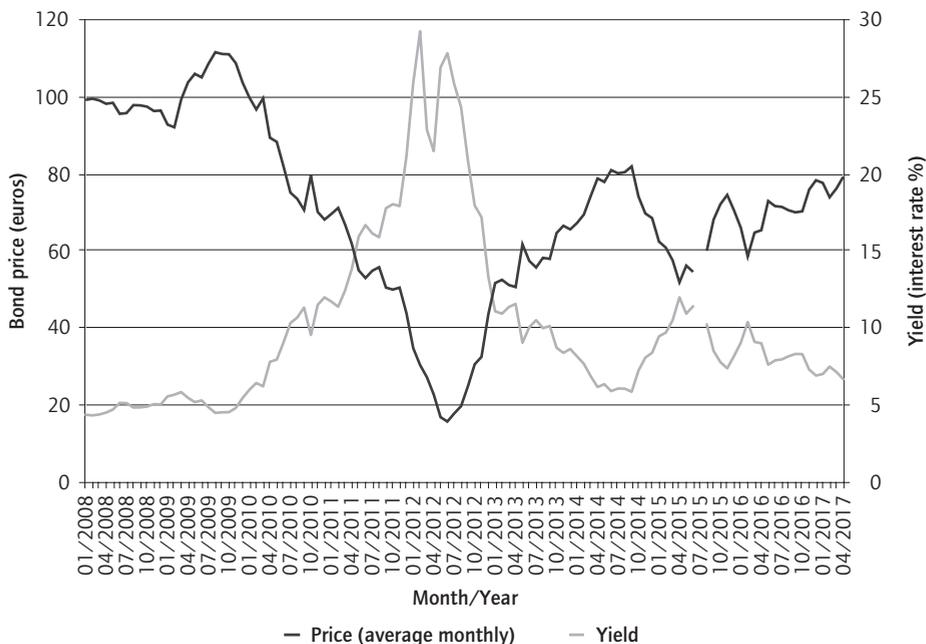
The price at which a bond can be sold/bought (in the secondary financial market – see also the glossary of terms) depends on the prevailing conditions of demand and supply for the bonds of a government: the more bonds a government has issued (that is, the more outstanding debt it has) compared to demand for bonds (for example, when many investors want to sell bonds because they no longer think they are a

good investment), the lower the price of the bonds will be. The higher the demand for a government's bond is, relative to supply (because, for example, investors think that these bonds are a good investment), the higher the price will be.

The price at which a government bond is sold and bought in the (secondary) financial market and the nominal interest rate it offers – what is widely known as its 'yield' – are inversely related: the higher the price of the bond (because, for example, there is relatively high demand for that bond in the market), the lower the yield. The lower the price of the bond (because, for example, there is a big sell-off of it in the market), the higher the yield will be.

Figure 1 below illustrates the inverse relationship between the price of a bond (in the secondary market) and its yield for the case of 10-year Greek government bonds between January 2008 and April 2017 (monthly average figures).

Figure 1 Price and yield of Greek government bonds (10-year duration), 01/2008–04/2017



Source: Bank of Greece.

The prices of the 10-year Greek government bonds started declining substantially in the autumn of 2009 when it emerged that the centre-right Karamanlis government had concealed the real magnitude of the government's budget deficit. At the same time, the yield of the bonds started increasing. Prices plummeted and yields peaked in the spring and summer of 2012, when political instability in Greece (two general elections within six weeks and electoral collapse of the hitherto two main governing parties) sparked great fears that the country was about to drop out of the eurozone. The next spike in the Greek bond yields was observed in the period

between autumn 2014 and summer 2015, when government instability emerged again and the new SYRIZA-led coalition government led a highly risky negotiation strategy with the country's lenders before capitulating and signing a third bailout agreement in the summer of 2015.

The yield on a government bond can be decomposed into two parts: first, the interest rate at which there is no perceived risk for default (the 'risk-free' interest rate) and, second, the risk premium, which depends on how likely the investors think it is that a government will stop servicing its debt. The higher the perceived likelihood, the higher the risk premium and the higher the interest rate at which a government will be able to borrow.<sup>1</sup>

Having the central bank play the role of lender of last resort can be a critical factor for reducing the risk premium part of the interest rate, as it would normally provide an implicit guarantee that the central bank will always intervene in the bond market to buy the troubled government's bonds, creating demand for them and thus supporting their price and keeping their interest rates from excessively rising. The risk-free interest rate depends on broader conditions relating to money demand and supply, for example the international interest rates (when capital is free to move, as in the eurozone) or monetary policy decisions which determine interest rates.

**Key fact: The lender of last resort to governments**

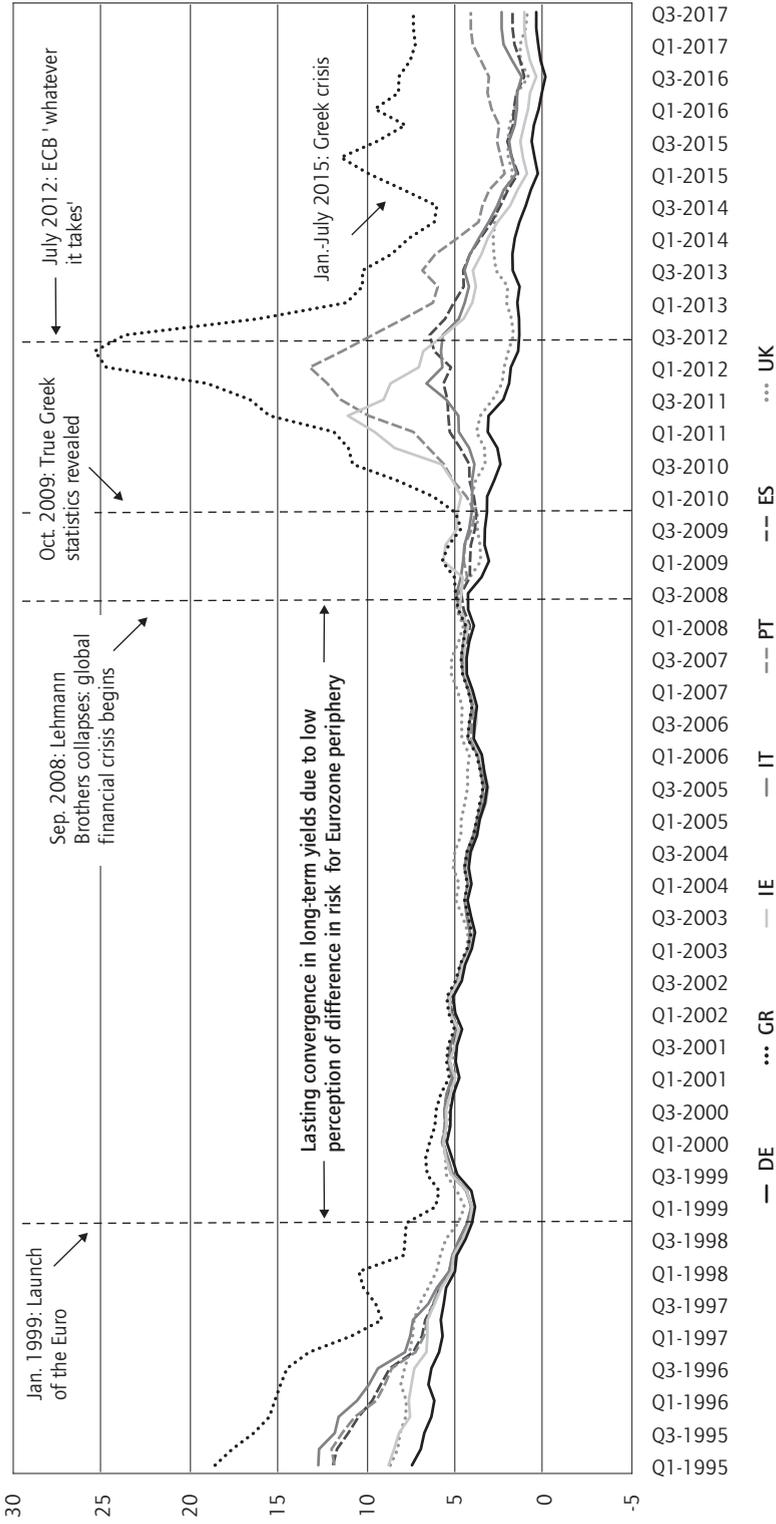
The existence of a 'lender of last resort', a role typically played by the central bank, helps, to a large extent, governments avert liquidity crises. The lender of last resort to a government provides the implicit promise that if necessary there will be a buyer of sovereign bonds in the market. Often that promise is sufficient for calming down market sentiment without actually having to intervene.

The trading price and the bond yield in the markets are important because they provide an indication of the price and interest rate at which a government can sell bonds to and borrow from the financial markets at a given point in time. When a government faces a 'crisis' in the bond markets, what actually happens is that large quantities of its bonds are sold, because, for example, investors do not want to hold them as they do not think that they are a good investment, their price falls (as their supply increases) and their interest rate increases.

Figure 2 below illustrates this. It shows the long-term bond yields for Member States of the eurozone whose bonds prior to joining the EMU used to be considered as 'highly risky' (Greece, Spain, Portugal and Ireland) as well as those of Germany and the UK. The government bonds of Germany and the UK tend to be considered as the 'safest' because the perceived risk of them losing value is zero. This is why we see in the graph that they have had the lowest yields. They also provide the

1. When the risk of default is perceived as high, then investors will likely start heavily selling the bonds of a government, leading to a lower price and a higher interest rate.

Figure 2 General government bond (long-term) interest rates (yields), selected EU Member States, Q1/1995–Q3/2017



Source: OECD, Economic Outlook June 2017.

benchmarks which the bond yields of other countries converged towards when joining the EMU and diverged from once the crisis began. The case of the UK is also shown here in order to illustrate the effect on a country's bond yields of having its own central bank. The UK was one of the countries that were hit first and the hardest at the beginning of the crisis. Its public finances were in a far worse state than those of Spain, and yet, as we see in Figure 2, the yields of the UK long-term government bonds did not increase anywhere near as much as those of the eurozone Member States that got into trouble.

**Focus: Credit rating agencies**

Credit rating agencies, by providing opinions on the ability of a country (or company) to pay back its debt obligations, often play an important role in shaping perceptions for major bond buyers, such as pension funds, thereby influencing their investment decisions. Given that investors often lack the technical knowledge to assess the likely future profitability of an investment, the specialised knowledge of organisations such as credit rating agencies is necessary. However, the quality and impartiality of the private credit rating agencies' ratings has been called into question during the crisis.

Credit rating agencies had consistently under-rated the deterioration in the 'fundamentals' of countries such as Greece prior to the crisis. Greece had demonstrated a remarkable deterioration in its fundamentals as, even in its inaccurate statistics reports, it was registering budget deficits and increasing public debt, even during the years where it had one of the highest nominal GDP growth rates in the eurozone<sup>2</sup>. Despite this, Greece was rated with As and a stable/positive outlook in 2007 and continued to be thus rated until 2009, when its outlook became negative and its A rating slowly declined. Moreover, credit rating agencies failed to change their ratings of several eurozone Member States after Mario Draghi famously declared in the summer of 2010 that the ECB would stand by to do 'whatever it takes' to preserve the integrity of the eurozone. Given that the ECB assumed the role of 'lender of last resort', which had been hitherto missing in the eurozone, there was no reason why the ratings of certain countries should remain low.

These failures have brought more attention to the conflicts of interest that are inherent in the operation of these agencies, where financing depends on their customers. Moreover, recent research has provided evidence that credit rating agencies have a partisan bias, being more likely to negatively assess the creditworthiness of a left-wing government than the creditworthiness of a right-wing government, given similar fundamentals (Barta and Johnston 2017). This has resulted in, on the one hand, a more subdued market reaction to changes in credit ratings by agencies and, on the other hand, calls for re-regulation of their role and the creation of a European public credit rating agency.

2. In order to have sound public finances management, when GDP grows fast, governments can (and should) make efforts to reduce their debt, as GDP growth will mean that they do not need to cut their spending for that purpose.

### Key fact: Market perceptions and the interest rate

The interest rate that a government has to pay on its debt is partly determined by the demand for and supply of a government's bonds. This essentially means that it depends on the perception of those participating in sovereign bond (financial) markets whether a government's bonds are a good (that is, safe) investment, likely to bring a return. If a government is perceived as likely to continue servicing its debt – that is, pay the coupons of the bonds as well as the principal (borrowed capital) – then demand is likely to remain strong, avoiding a fall in the price of bonds and an increase in the interest rate.

## 1.5 Why do we measure public debt as a share of GDP? Is this the best measure to use?

A very conventional measure of a country's public indebtedness is the ratio of gross public debt to GDP. This is a rough measure of the public debt burden for an economy, as presumably the outstanding debt and its interest are paid out of the resources (GDP) that a country produces every year. The ratio itself does not indicate whether the debt has been created in order, for example, to finance investment in productive infrastructure or to pay for military equipment of questionable usefulness. In this respect, the debt/GDP ratio in itself does not say much about whether deficits have been used to enhance the future growth capacity of a country, which is crucial for paying back the debt without delays and disruptions. This caveat notwithstanding, high debt ratios (close to or above 100%) are more *likely*, though by no means certain, to generate questions about the capacity of a country to service its debt than lower ones, and lead to scrutiny of other indicators that can illustrate the health of an economy. If this happens, then the interest rate at which a government can borrow will rise. Whether this will indeed happen, however, depends, among other things, on who holds this debt.

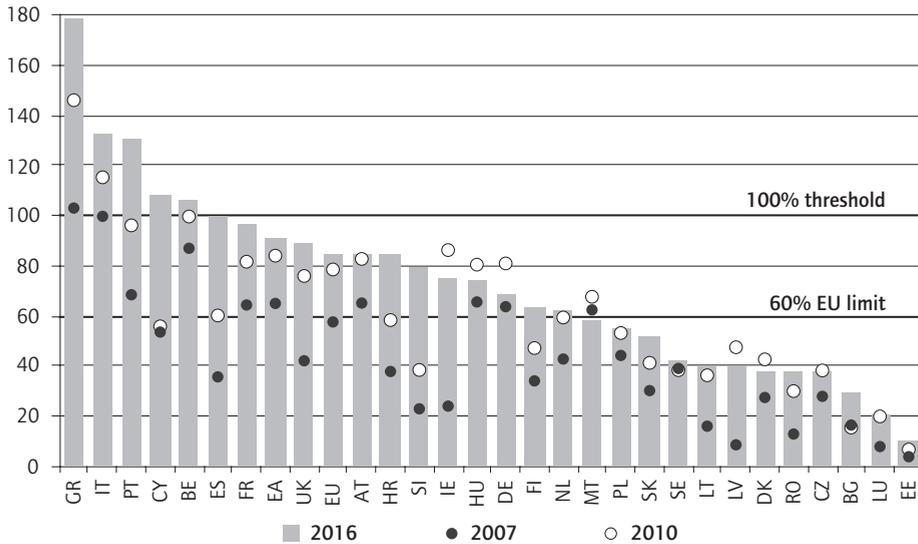
### Focus: The case of Japan

The case of Japan is telling. Japan's public-debt-to-GDP ratio has been above 100% since the late 1990s and exceeding 200% since the 2010s. However, large parts of this debt are held by domestic savers and the country's central bank, whose behaviour is not dominated by the search for higher yield. Domestic savers are not in a rush to sell when the sentiment in financial markets changes for the worse, while the Bank of Japan has been buying large quantities of government bonds as part of its monetary policy against deflation. Thus, due to the size of its debt, Japan has had a high debt burden to service, taking up half of its revenues, but it has not been facing a crisis in its government bond market in the form of high and rising interest rates.

Alternative measures of assessing the burden of a country's public indebtedness have been suggested. If what is important is the ability of a government to keep on servicing its debt – that is, to keep on paying the coupons on its bonds and the principal (the capital originally borrowed) whenever they are due – indicators of

when these payments are due and how high they are relative to a year's output (GDP) can be just as important. For example, there are many commentators who argue that the effective debt burden on Greece is currently lighter than its debt/GDP ratio suggests, and also in comparison to countries like Italy, Portugal and Spain, because the share of its GDP that it has to pay per year for the next several years in order to service its debt is of the order of 1.5% of GDP (Gros 2015).

Figure 3 Gross general government debt as a share (%) of GDP, EU Member States, 2007, 2010, 2016



Source: AMECO UGDD series.

What such arguments reveal is that if the main risk of high public debt is that it may fuel fears of a government default among investors, then the likelihood of whether such a default may happen may not be reflected by the total debt burden but rather by whether the government has to make too large payments (as a share of its GDP) in the near future in order to keep on servicing its debt.

#### Key fact: The level of public debt and the risk of default

When thinking about statistics on public debt, a key consideration is the likelihood of a government defaulting on (that is, stop servicing) parts or all of its debt. Thus, when evaluating the size of a government's debt, it is important to consider the factors that shape the risk for default. The size of the debt is only one of such factors and often not the most important one.

## **1.6 Who holds the public debt of a country? Does it matter? Is it easy to locate?**

It can be households, financial institutions, pension funds, companies, or, in general, any investor. The distinction between the debt being predominantly held domestically or abroad makes a difference. Insofar as coupon and principal payments are covered by government revenues and/or borrowing, if they are mostly paid to domestic institutions, companies and households, then that money is potentially spent within the economy (not by the government but by the bondholders). Moreover, as the Japan example suggests, domestic savers are less likely to be primarily interested in getting the highest yield and therefore more likely to provide some stability in the market for their government's bonds. By stability, we mean that interest rates are kept stable, with no large fluctuations, especially upwards. If the coupons and principal payments are made to holders residing abroad, then that money leaves the economy and it is far more uncertain whether and to what extent any of it will create demand for the economy (through, for example, demand for exports), if not entirely unlikely.

Some of the typically big holders of a government's debt are the country's banks and pension funds. The high propensity of such institutions to buy their government's own debt as a (at least until recently) safe investment can support the demand for a government's bonds, thus facilitating its borrowing. However, high holdings of own government debt can also result in the government having to borrow more if banks or pension funds get into financial trouble (that is, see the value of their assets fall dramatically). A government is ultimately responsible for recapitalising the banking system of a country and it for financing deficits in pension funds (see the term 'contingent liabilities' in the glossary). When the price of a government's bonds falls (because they are not considered to be a good or safe enough investment), then the assets of banks or pension funds lose value and may put their operation in trouble. This is most likely to happen at a time when a government has difficulties borrowing in the markets. It is at such a time, and due to the fact that banks and pension funds hold large amounts of its bonds, that the government will have to support them. This would typically increase the government's borrowing needs. Recent examples of this 'deadly loop' between banks and governments over the past few years can be found all over the eurozone periphery. Ireland's budget deficit rose to 32% of its GDP in 2010 when it had to bail out its banks. The Greek public debt restructuring in 2012 did not alleviate the country and was not fully reflected in its public debt figures as the Greek government had to borrow large amounts of money to shore up the Greek banks who took a hit from the lowered value of Greek government bonds they held as assets.

In general, it is rather difficult to locate the holders of government bonds as, once issued, these are sold and bought in the financial markets, thus 'changing hands' quite fast and often.

## 1.7 How does the public debt/GDP increase/decrease?

Every year, a government has to finance its expenditure plans and pay interest on its outstanding debt (see section 1.1). There are three ways in which it can finance these expenses: by taxing, by borrowing (through the issuing of new bonds) or by ordering the central bank to print new money. The latter option eventually leads to higher inflation and is not allowed in the EMU. Thus, unless the government receives sufficient tax revenues to cover its planned expenditure and due interest payments, it will have to borrow and therefore increase its debt.

The difference between expenditures and revenues is the government budget balance. If expenditures are greater (smaller) than revenues, there is a deficit (surplus). The *general* or *headline* budget balance is the difference between expenditures and interest payments on outstanding debt on the one hand, and tax revenues on the other. The *primary* budget balance is the difference between expenditures, excluding interest payments on outstanding debt, and tax revenues.

Further definitions (or rather distinctions) of the primary government budget balance (deficit or surplus) are related to the way in which expenditure and revenues (that is, fiscal policy) are shaped. We can roughly distinguish between two types of actions in fiscal policy: automatic stabilisers and discretionary fiscal policy.

The automatic stabilisers are taxes and expenditure that vary according to the level of income in an economy. For example, tax revenues that are determined as a percentage of income will increase when an economy grows and fall when an economy slows down. Similarly, expenditure on unemployment benefits rises when output falls and unemployment increases in an economy, and it falls in the opposite case. The function of automatic stabilisers means that, other things being equal, the government balance will deteriorate during a recession (a deficit will expand or a surplus will shrink) and will improve during a boom (a deficit will shrink or a surplus will increase). Automatic stabilisers are valuable tools for stabilising an economy whether it shrinks or booms.

Discretionary fiscal policy constitutes tax revenues and expenditures that do not vary automatically with the level of output in an economy. For example, expenditure on public investment is not shaped by the fluctuations of income in an economy, although a government may *choose* to increase its expenditure on public investment in response to a slowdown or recession. Discretionary fiscal policy also has effects on the government budget balance.

The public debt increases every time (namely, every year) a government has a budget deficit; that is, its tax revenues for the year are lower than its expenditures. These expenditures include interest payments on outstanding debt.

### Focus: The EU fiscal rules and their recent reforms

An early lesson that policymakers drew from the public debt crisis in the EU was that the surveillance of national fiscal policies should be improved. Up until the crisis, the main framework coordinating national fiscal policies was the Stability and Growth Pact. First established in 1998 and reformed in 2005, it stipulated that governments should aim to achieve balanced budgets over the medium run, defined as 'over the business cycle' and meaning, on average, over a full period of output growth and recession.<sup>3</sup> The budget deficit of a government should not exceed 3% of GDP, unless exceptional circumstances (that is, a recession of 2 or more % in a year) are invoked. It also stipulated that general government debt should not exceed 60% as a share of GDP; if public debt is above this threshold, then it should be declining at a satisfactory enough rate until it drops below 60%. However, in practice this rule was not enforced prior to the crisis.

Following the crisis, the EU's fiscal rules were reformed in order to be reinforced. Central to these reforms were two legislative packages aimed at strengthening the Stability and Growth Pact, known as the 'Six Pack' and 'Two Pack' (for the euro area), and the Treaty on Stability, Coordination and Governance in the Economic and Monetary Union (TSCG)<sup>4</sup>.

The new rules of the 'Six Pack' make the existing 60% of GDP debt limit operational. This means that Member States can be placed in the Excessive Deficit Procedure (see Glossary) if they have debt ratios above 60% of GDP that are not being sufficiently reduced (i.e. the excess over 60% is not being reduced by at least 5% a year on average over three years). Under the new rules, public spending must not rise faster than medium-term potential GDP growth, unless it is matched by adequate revenue increases. Since January 2014, signatories of the TSCG must have legally binding, medium-term budgetary objectives enshrined in national law. They must also limit structural deficits (that is, the difference between the spending and revenues which are at their discretion and not automatic; see glossary for definition) to 0.5% of GDP (or to 1%, if their debt-to-GDP ratio is well below 60%). The TSCG also says that automatic correction mechanisms should be triggered if the structural deficit limit (or the adjustment path towards it) is breached, which would require Member States to set out in national law how and when they would rectify the breach over the course of future budgets.

The Stability and Growth Pact focuses more on improving public finances in structural terms (taking into account the effects of an economic downturn or one-off measures on the deficit). Member States set their own medium-term (on average, over a cycle of output growth and recession) budgetary objectives. The Commission checks that the chosen medium-term budgetary objectives comply with the requirements set out in the Stability and Growth Pact. The goal is to improve the structural balance and converge towards the medium-term budgetary objective, by 0.5% of GDP a year as a benchmark. This provides a safety margin against breaching the 3% headline deficit target, with Member States, particularly those with debt levels over 60% of GDP, urged to do more in economically good times and less in bad

3. This is so because, for example, in the case of a recession (that is, when output growth falls), even if the government does not do anything to change its expenditure and (tax) revenues, they rise and fall respectively, resulting in a higher budget deficit (or lower surplus). The opposite is true when output growth accelerates.
4. All EU Member States except the UK, the Czech Republic and Croatia have now signed this Treaty.

times. The Commission and the Council assess whether Member States meet their medium-term budgetary objectives, as set out in their Stability or Convergence Programmes presented each April. The assessments feed into the Commission's country-specific recommendations each spring. This comes on top of the opinions on the draft budgetary plans delivered annually to euro area Member States in autumn.

In addition to the country-specific recommendations and dedicated fiscal recommendations, if there is a significant deviation from the medium-term objective or the adjustment path towards it, the Commission addresses a warning to the Member State, to be endorsed by the Council. The situation is then monitored throughout the year, and if it is not rectified, the Commission can propose an interest-bearing deposit of 0.2% of GDP (euro area only), which must be approved by the Council. This can be returned to the Member State if it corrects the deviation.

If Member States breach either the deficit or debt criteria, they are placed in an Excessive Deficit Procedure, where they are subject to additional monitoring (usually every three or six months) and are set a deadline for correcting their excessive deficit. The Commission monitors compliance throughout the year, based on regular economic forecasts and on Eurostat data. The Commission can request more information from or recommend further action to those at risk of missing their deficit deadlines. For euro area Member States in the Excessive Deficit Procedure, financial penalties kick in earlier and can be gradually stepped up. Failure to reduce the deficit adequately can result in fines of 0.2% of GDP. Fines can rise to a maximum of 0.5% if statistical fraud is detected. Penalties can include a suspension of EU regional funding, even for non-euro area countries. The 25 Member States that signed the TSCG, meanwhile, can be fined 0.1% of GDP for failing to properly integrate its provisions into national law.

The adoption of the annual country-specific recommendations follows a 'comply or explain' principle, whereby Member States must justify changes to the original proposals from the Commission. Moreover, decisions on most sanctions under the Excessive Deficit Procedure are now taken by reverse qualified majority voting (RQMV), which means that fines are deemed to be approved by the Council unless a qualified majority of Member States overturns them. This was not possible before the 'Six Pack' entered into force. In addition, the 25 Member States that have signed the Fiscal Compact have now agreed to introduce the RQMV mechanism even earlier in the process, for example, when deciding whether to place a Member State in the Excessive Deficit Procedure.

The 'Two Pack' introduced an additional cycle of monitoring for the euro area, as well as tighter surveillance of those facing more serious difficulties. Under the 'Two-Pack' euro area Member States (except for those Member States under macroeconomic adjustment programmes) must present their draft budgetary plans (DBPs) for the following year by 15 October. The Commission then issues an Opinion on these DBPs. Euro area Member States must present the so-called 'Economic Partnership Programmes' when entering the excessive deficit procedure (EDP) or receiving a new EDP deadline. These Economic Partnership Programmes contain detailed fiscal and structural reforms (for example, on pension systems, taxation or public healthcare) for correcting Member States' deficits in a lasting way.

Member States experiencing financial difficulties or under precautionary assistance programmes from the European Stability Mechanism are put under 'enhanced surveillance', which means they are subject to regular review missions by the Commission and must provide additional data on, for example, their financial sectors. Member States experiencing or threatened with serious difficulties in respect to their financial stability, which could have significant adverse effects on the rest of the euro area, can be asked to prepare full macroeconomic adjustment programmes. This decision is taken by the Council, acting with a qualified majority on a proposal from the Commission. These programmes are subject to quarterly review missions and strict conditionality in exchange for any financial assistance. Member States will undergo post-programme surveillance as long as 75% of any financial assistance drawn remains outstanding.

Overall, the recent reforms of the fiscal rules have not addressed the problem of not allowing national fiscal policies to play their necessary stabilising role. Requirements have been tightened, while the focus on 'structural' instead of 'headline' budget balances does not help. Structural balances can only be estimated, not actually observed, an exercise which became particularly difficult during the recent prolonged recession. As a result, structural deficits have in several cases been shown to have been overestimated, leading to fiscal policy recommendations that were more restrictive than what would have been optimal or necessary. On the other hand, the 'flexibility' introduced by the European Commission in implementing the rules has made the process more opaque, allowing scope for politically biased assessments.



## 2.

# Public debt, growth and crises

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### 2.1 What determines the evolution over time of the public debt/GDP ratio?

To understand what determines the evolution over time of the public debt/GDP ratio, we need to start by thinking about the balance between the expenses of a government and the potential sources from which it can finance them. In any given year,

$$\begin{aligned} \text{nominal expenditures} + \text{interest payments on outstanding public debt} \\ \text{is always equal to} \\ \text{nominal tax revenues} + \text{new bonds (new borrowing)} + \text{new money} \end{aligned}$$

In other words, government expenditures and the expenditure on interest on its outstanding debt can be financed either from tax revenues and/or from new borrowing and/or from having the central bank print new money to that end. The latter option is forbidden in the eurozone. This means that a year's total expenses can be financed either by taxes and/or by borrowing.

Taking into account both the above statement and that the standard measure of public debt is the debt/GDP ratio, we arrive at the following statement on what determines the evolution of public debt as a share of GDP over time:

$$\begin{aligned} \text{change of public debt/GDP over time} \\ \text{is equal to} \\ (\text{primary budget deficit/GDP}) + (\text{real interest rate paid on debt} - \text{growth rate} \\ \text{of real GDP}) \times (\text{public debt/GDP}) \end{aligned}$$

**Key fact: The determinants of the public debt/GDP ratio over time**

The evolution of the public debt/GDP ratio over time depends on the government primary budget balance (that is, of expenditures excluding interest payments on existing debt), on the real growth rate of GDP, and on the real interest rate<sup>5</sup> paid on existing debt.

According to this calculation, if the real output growth rate is higher than the interest, then, assuming a balanced or surplus budget, the debt/GDP ratio will fall. To put it simply, if a government does not generate new debt (through deficits) and output grows faster than the interest rate paid on existing debt, this will allow the existing debt to be paid back. If output growth is lower than the interest rate, then a government will have to make savings through a surplus on its budget in order to reduce its debt/GDP over time. An increase in the risk premium part of the real interest rate, insofar as it results in an interest rate higher than the real output growth rate, can throw a government into a vicious cycle of pursuing higher budget surpluses in order to stabilise its debt, which then depress real output growth further and so on. If a government generates deficits, then after a few years either it will have to generate surpluses or the growth of output will have to be higher than the interest rate (or both) as a necessary condition for its debt to fall.

It should also be noted that the real interest rate that shapes investors' decisions is the difference between the nominal interest rate at which a government borrows and the expected<sup>6</sup> inflation rate. Other things being equal, a higher inflation rate results in a lower real interest rate. In other words, higher actual inflation can help reduce debt over time<sup>7</sup>. On the other hand, high debt may also lead to government policy responses that fuel inflation to lower the real value of debt (Carlin and Soskice 2015).

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5. The real interest rate is the difference between the nominal interest rate and expected inflation. The higher the expected inflation is, for any given interest rate, the lower the real interest rate will be. Thus, low expected inflation may reinforce bad public debt dynamics. Measures of expected inflation are usually compiled by means of surveying the expectations of consumers and of financial and non-financial institutions. The European Commission and the ECB use several such surveys.
  6. Investors use expected inflation when making decisions about investment because they need to assess the real returns of an investment which usually extend into the future. The real (as opposed to nominal) returns of an investment are the interest adjusted for the price level. Not all expectations need to be the same, but 'ordinary' people may prefer to rely on professional forecasts of organisations who are likely to have better (though obviously not error-proof) tools and expertise to make such predictions. The ECB and DG Ecfm regularly conduct and publish the results of surveys of professional forecasters on expected inflation for certain periods of time. There is of course the ex post real interest rate, once inflation has materialised, which is 100% accurate but not necessarily useful for predicting future returns on an investment. Past inflation does influence expectations about future inflation, although the longer the period for which the forecast is made, the less likely it is that past inflation is an accurate predictor of future inflation.
  7. Conversely, very low or negative inflation (deflation) increases the burden of servicing (that is, of paying back) debt. Debt is typically denominated in nominal terms and borrowers (for example, a government) have to pay back fixed amounts at regular intervals. If wages and prices fall every period and we have deflation, then the burden of debt payments increases as a share of income (Carlin and Soskice 2015)

Table 1 How the government budget balance and the difference between real interest and the real growth rate interact to shape the evolution of the debt/GDP ratio over time

Government balance	Difference between real interest rate and real growth rate		
	Interest rate > growth rate	Interest rate = growth rate	Interest rate < growth rate
> 0 (surplus)	Depends on whether surplus is much bigger than difference between interest rate and growth rate: if so, debt/GDP ↓; if not, debt/GDP ↑	Debt/GDP ↓	Debt/GDP ↓↓
= 0 (balanced)	Debt/GDP ↑	Debt/GDP constant over time	Debt/GDP ↓
< 0 (deficit)	Debt/GDP ↑↑	Debt/GDP ↑	Depends on whether the difference between growth rate and interest rate is much bigger than deficit: if so, debt/GDP ↓; if not, debt/GDP ↑

## 2.2 Are the factors upon which the evolution of public debt/GDP depends related and if so, how?

The conclusion we can draw from the above points is that the most direct means that a government has at its disposal for reducing its debt/GDP ratio are its revenues and primary expenditures (excluding interest payments). During an economic slowdown or recession, achieving a surplus of revenues over expenditures requires more effort, as slowdowns/recessions tend to expand budget deficits.

Output growth depends on many factors, including the government's fiscal policy and the interest rates in the economy. The latter determine demand by influencing decisions about consumption and investment. The balance between a government's revenues (taxes) and expenditure (in other words, its fiscal policy) can have an effect on output growth. Governments often choose to bring the balance between their revenues and expenditure into surplus; that is, make sure that their expenditure does not exceed their revenues in order to reduce their debt/GDP ratio.

The potential problem with this approach is that it can have a detrimental effect on output growth, causing a slowdown or recession. In the former case, output growth slows down and may approach zero, which makes it less likely that output growth will exceed interest rates. In the case of a recession, output growth turns negative (that is, it contracts). In other words, fiscal austerity, when undertaken under the wrong conditions, may support as much as undermine the reduction of the public debt/GDP ratio: while a balanced or surplus budget may not add to the public debt (thus contributing to its reduction), the lower output growth it leads to may diminish the prospects of reducing public debt by making the interest rate higher than the output growth. Figure 3 (above) illustrates this point: we see that the public debt/GDP ratio has risen since 2010 even in Member States that have

been undertaking the largest austerity efforts (for example, Greece, Portugal and Spain), although it has started declining in Ireland.

**Focus: The fiscal multiplier**

The extent to which a cut in public spending and/or rise in taxes aiming at a balanced or surplus budget will result in lower output growth depends on the so-called 'fiscal multiplier'. The fiscal multiplier shows how much a spending cut or tax rise will reduce demand and output in an economy. The size of fiscal multipliers varies depending on the circumstances. A big mistake (and big ensuing debate) at the beginning of the crisis was the assumption that the fiscal multiplier for eurozone economies in trouble (such as Greece) was much smaller than in reality. If a fiscal multiplier is small, then the effect of fiscal austerity on demand and output growth is also small. Therefore, the likelihood that fiscal austerity will reduce the sustainability of the public debt is smaller. If, however (and as it turned out), the fiscal multiplier is high (greater than 1), then fiscal austerity generates a big drop in demand and output growth, thus undermining debt sustainability.

**Focus: Expansionary austerity**

In the 1990s, empirical research in economics had proposed the hypothesis of 'expansionary fiscal austerity', whereby, under certain conditions, episodes of 'fiscal consolidation' (that is, cutting public expenditure and/or raising taxes so as to improve the government budget balance) could lead to output growth (or more technically, cause 'non-Keynesian' effects) (see for example Giavazzi and Pagano 1990; Alesina and Perotti 1995; Giavazzi and Pagano 1996; Alesina and Perotti 1997; Alesina and Ardagna 1998, 2010). This literature proved to be very influential with the European Commission services in 2009 when EU economic policy guidelines shifted away from fiscal stimulus to fiscal consolidation.

However, the hypothesis of expansionary austerity has been criticised on various grounds. It has been found that fiscal consolidations lead to lower output growth, lower domestic demand and higher unemployment in the short run. These detrimental effects only diminish if the central bank reduces interest rates and the exchange rate is depreciated.

Also, spending cuts have been shown to lead to less detrimental effects than tax hikes because the central bank is more likely to respond to the former by easing monetary policy (IMF 2010; Guajardo et al. 2011; Carlin and Soskice 2015), which illustrates why 'expansionary fiscal austerity' did not work in the eurozone. For one thing, until 2012, the policy of the ECB was not particularly accommodating. Moreover, the ECB could not lower interest rates in response to the fiscal consolidation efforts of certain Member States alone. Last but not least, any potential effects from higher exports were neutralised as demand was subdued across the eurozone, while any improvements in net exports (meaning the difference between exports and imports) was more driven by lower imports, which are a result of weaker domestic demand.

The expectations about the capacity of a government to keep on servicing its debt depend on the prospects of its economy, the level of its debt, the structure of its debt servicing obligations over time and the implicit guarantee that it will not be allowed to default, (i.e. the existence of a lender of last resort). If economic forecasts about an economy suggest that it is likely to grow robustly in the future, then that is likely to make a government's debt sustainable. In the case of eurozone members, the occurrence of negative shocks in some Member States but not in others, in combination with the inflexible fiscal rules of the Stability and Growth Pact (SGP), meant two things. First, that in the absence of national monetary and exchange rate policies, economies in trouble had one tool less to face adverse shocks, whereas fiscal policies were not allowed to act as stabilisers (i.e. prop up demand when low, and stifle it when too high) to a sufficient extent. Therefore, membership of the eurozone and adverse shocks to only some economies made their growth prospects look worse than if they had not been members. Secondly, if, under these conditions, confidence in some eurozone governments' capacity to service their debt dwindled, then investors in sovereign bond markets within the eurozone could easily sell their bonds and buy the bonds of governments with more robust economies. This is one of the ways in which membership of the eurozone can result in higher interest rates for a government.

Governments that issue debt in a currency managed by a central bank that is backed financially by their own treasury enjoy an implicit guarantee: the central bank will not allow the government to default and will, if necessary, buy its bonds from the secondary market. While this was the case in the UK, in the eurozone it was a different story until 2012. The UK economy took a big hit in 2008-9: its output plunged while its budget deficit soared. However, the British government never came anywhere near facing a crisis in the financial markets, thanks to the implicit guarantee of the Bank of England. This implicit guarantee, when adequate, means that the central bank will not actually have to do what it promises. The mere promise is sufficient. By contrast, Spain's public finances were in a much better shape than Britain's, yet it saw its government bond yields rise, especially as the Greek crisis unfolded because until 2012 it did not benefit from the guarantee of a lender of last resort in the shape of the ECB (De Grauwe 2014) (see also Figure 2, p.12). In this respect, membership of the eurozone alone was an important factor behind the increase first in the yields and eventually in the public debt of several governments in the eurozone. This is the second way in which membership of the eurozone can result in higher interest rates for governments wanting to borrow.

In the eurozone, there was no lender of last resort (see also Key fact box 'The lender of last resort' on p.12) until 2012. The Maastricht Treaty bans the ECB from buying government bonds in the primary markets (see also Glossary for the distinction between primary and secondary markets), and the previous governor, Jean-Claude Trichet, had been reluctant to provide such support, insisting that governments facing difficulties in the markets should try to remedy the situation through fiscal austerity. In 2012, his successor Mario Draghi changed that by announcing that the ECB would 'do whatever it takes' to preserve the integrity of the eurozone with its

Outright Monetary Transactions (OMT) programme<sup>8</sup>. However, it did so under the condition that it would only intervene in the secondary sovereign bond markets to support the bonds of troubled governments if those governments requested financial support and entered a conditionality agreement (a typical ingredient of which is fiscal austerity) with the EFSF/ESM (see Glossary for explanation of these acronyms). The latter would provide a guarantee that the government in question would not default. The possibility that a government whose bonds the ECB has bought may default is perceived as a problem because unlike 'national' central banks, the capitalisation of the ECB is not jointly guaranteed by the Member States that participate in the euro. In other words, there is no eurozone treasury backing the ECB.

### **2.3 When does a government face a liquidity crisis and when does it face a solvency crisis? What can lead to each of these situations?**

A government faces a liquidity crisis when it finds it difficult to sell new bonds (new debt) in the markets. This happens when the conditions (of demand for and supply of its bonds) prevailing in the bond markets mean that it cannot borrow at a sufficiently affordable interest rate in order to keep on servicing/rolling over its debt. In practice, demand for its bonds is so low and supply is so high (in other words, investors sell many more of a government's bonds than they buy) that the price of the bonds falls and, consequently, the interest rate rises. For example, the difficulties that Spain faced in 2010-2012 in the form of high interest rates in the bond markets were a liquidity problem/crisis, as the fundamentals (the relationship between the budget deficit, the output growth rate and the real interest rate) did not suggest that its debt would grow unsustainably.

A government faces a solvency crisis when, given an already high debt, the expected balance on its budget, the expected real growth rate of its output and the expected real interest rate suggest that there will be an explosive increase in its debt.

The two situations can be connected. Governments often need to increase their borrowing when their economy is in recession. If a government faces a liquidity crisis, then the buyers and sellers in the financial markets may start selling its bonds in large quantities, fearing that it will not be able to borrow to keep on rolling over/servicing its debt. Unless someone (for example, the central bank) is willing to buy them, their price will fall and their nominal interest rate will increase. A typical government response under such situations is to take measures that improve the balance between its revenues and expenditure, that is, impose fiscal austerity: reduce a budget deficit or increase a budget surplus by raising taxes and/or cutting expenditure. This is likely to impact negatively on output growth and will not pacify 'the markets'. If expected real output growth falls and the interest

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8. The ECB had launched a programme of buying government bonds, the Securities Market Programme (SMP), in 2010-11. However, that was a programme of limited purchases, unlike the OMT which promised to buy unlimited amounts of bonds if necessary, thus providing the guaranteed function of lender of last resort.

rate paid on public debt increases by a lot, then a liquidity crisis can turn into a solvency problem, as a self-fulfilling prophecy.

On the other hand, a government may have a solvency problem but not face a liquidity crisis just yet. A lot depends on the conditions in the bond markets; that is, on the demand and supply of its bonds.

## **2.4 Does all this mean that membership of the eurozone can only be bad for public finances?**

No. Membership of the eurozone can, in the cases of adverse shocks that hit some countries but not others, lead into higher deficits and greater difficulties for governments to finance their deficits. However, membership of the eurozone also led to a substantial reduction of interest rates at which governments across the eurozone could borrow between 1999 and 2008 (see Figure 2, p.12)<sup>9</sup>. For certain governments, especially in the southern periphery of less economically developed Member States, this was an important shift. Other things being equal, access to low-cost finance for governments can be an advantage insofar as it is used for productive public investment and the modernisation of their economies. Nevertheless, the crisis has revealed certain gaps in the institutional architecture of the eurozone that need to be addressed, while a solution for the accumulated public debt will also have to be found. At the heart of the pressures that the eurozone creates for public finances is the continued exclusive existence of national public budgets and fiscal policies and the way in which their necessary coordination has been organised. Some steps towards addressing these problems have been taken but progress is hindered due to political obstacles to full fiscal integration, which would require a far-reaching political union. Ultimately, the balance between the positive and negative effects of EMU participation on public finances will depend on whether and how soon these political obstacles can be overcome.

## **2.5 When is the request for a bail-out from international organisations necessary?**

When a government faces a liquidity crisis – meaning it cannot borrow from the financial markets in order to roll over its debt at interest rates that are not too expensive – then it may have to request a bailout from an international organisation (the IMF and/or the ESM in the eurozone) to avoid defaulting on its debt obligations; that is, to avoid stopping the scheduled payments of principal and coupons. This happens if the risk premium part of the interest rate at which a government can borrow increases so much that it makes borrowing unaffordable. To this end, perceptions of risk matter (see sections above on credit rating agencies and the central bank as a lender of last resort).

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9. The decline of interest rates at which governments could borrow began in the countries of the so-called 'eurozone periphery' before 1999, when it became clear that they were on track for meeting the Maastricht criteria which would allow them to be admitted into the eurozone.

Typically, international organisations bail out governments that face a liquidity and *not* a solvency problem. In other words, international organisations would not lend money and add to the debt of a government whose debt is already too high to be paid. An exception to this principle may be made (and in fact was made in the case of the recent Greek bailouts) if a default is likely to trigger a ‘systemic crisis’; that is, likely to cause liquidity-cum-solvency crises for other governments and/or shake confidence in the solvency of banks which typically hold large quantities of government bonds as their assets.

## **2.6 Is high public debt a problem? If so, why?**

High public debt can be a risk to the extent that large amounts of government borrowing may be necessary in the face of crises, from wars to natural disasters to financial crises (Obstfeld 2013), and if a government is already highly indebted. When such a crisis occurs, then it is possible that the government's capacity to act as a ‘line of last resort’ is limited because its high debt/GDP ratio may result in investors not wanting to buy its bonds and having to pay high (or even prohibitively high) interest rates. However, it is not clear at what level of public debt investors would consider it a bad investment and not be willing to buy a government's bonds unless offered at punishingly high interest rates.

Moreover, a high debt/GDP ratio makes a government vulnerable to changes in interest rates (Mauro and Zilinsky 2016). As mentioned earlier, a government needs to keep on rolling over its debt by issuing new bonds to replace the ones that expire. The more debt it has, the more rollover it will need to do. While the interest rate at which it can borrow will depend on the demand for and supply of its own bonds, it also depends on other international factors (broadly speaking, related to international money demand and supply) which, especially if it is a small country, may be beyond its control. If for any reason interest rates increase, then the government will face a large increase in its debt-servicing costs because the interest it will have to pay will rise. Other things being equal, this is likely to leave less space for public expenditure on other projects (for example education).

In view of this, high public debt/GDP ratios are likely to put pressure on governments to reverse them sooner rather than later to mitigate these risks. To do that, budget surpluses need to be produced, which imply a mix of higher taxes and lower expenditures. If such surpluses are produced at a time when the economy is also slowing down, then we talk about fiscal austerity (Wren-Lewis 2016). Higher taxes can have distorting effects in an economy, which may not always be justifiable, even for performing functions such as redistribution and poverty relief, as they affect incentives for investment and labour supply. On the expenditure side, public investment is most likely to suffer when a government attempts to create surpluses, especially during an output slowdown, as cutting back on such future expenses is likely to be met with weaker political opposition given that it does not involve rolling back existing expenditures and transfers.

## 2.7 What is the relationship, if any, between (high) public debt and output growth?

There is no short or unequivocal answer to this question. At the beginning of the crisis in 2010, Reinhart and Rogoff published a paper which stated that public debt/GDP ratios at 90% and above were associated with about 1% lower growth annually (Reinhart and Rogoff 2010). This paper was then used by policymakers, especially at the EU level, in order to justify the shift of fiscal policies from stimulus to austerity. However, subsequent empirical research cast serious doubts on the validity of the Reinhart-Rogoff argument and on its policy implications. First, it was discovered that the negative relationship between public debt and output growth was much weaker once some error in the data they had used had been corrected (Herndon *et al.* 2014). Secondly, other economists suggested that it was in fact lower output growth that caused a higher public debt/GDP ratio, rather than the other way around (Irons and Bivens 2010; Krugman 2010).

The debate on whether high public debt causes low growth (and if so, what is the threshold level of debt/GDP above which it has this effect) or whether it is low growth that causes high public debt remains unsettled, with evidence existing in support of both sides (Irons and Bivens 2010; Kumar and Woo 2010; Cecchetti *et al.* 2011; Basu 2013; Baum *et al.* 2013; Dube 2013). However, certain points from existing academic and policy work should be retained.

First, the case for a *specific* and *universal* (that is, applying in all countries) public debt/GDP threshold above which growth is compromised has yet to be made, as the case for the negative relationship between debt and growth above the 90% threshold has not proved to be robust when using different samples, specifications and estimation techniques (Panizza and Presbitero 2013: 13).

Secondly, we need more understanding of and empirical evidence on the channels through which public debt and growth may have an impact on each other (with the causality potentially running both ways). Theory on the subject suggests various such channels. For example, high public debt may prompt a government to pre-emptively raise taxes and cut expenditure in order to reduce debt, leading to lower demand and growth. A highly indebted government may also not borrow sufficiently in the face of an adverse shock to the economy, thus creating a negative association between high debt and growth. On the other hand, to the extent that a high public debt (which requires high government borrowing to keep rolling it over) puts upward pressure on interest rates in an economy, it may result in 'crowding out' private investment and consumption, thus reducing demand and growth.

Whether such effects will materialise depends on the broader context, however. For example, at the moment, interest rates in most advanced economies are very low if not negative. This has followed from a protracted period of stagnation after the crisis and means that monetary policy has reached its limits in stimulating demand and growth in these economies (as there is not much scope for reducing interest rates further). There are concerns that such low interest rates are likely to

persist for a long time, reflecting the relatively higher global savings. This is the hypothesis of ‘secular stagnation’. Under such circumstances, the risk that even highly indebted governments may face increased costs of borrowing is relatively remote. Economic theory also suggests that a fiscal expansion (that is, an expansion in public spending) will go much further in reviving economies. To address any questions of future debt sustainability, public spending could be dedicated to investment projects that would stimulate growth even in the longer run, thus ‘paying for themselves’. Policy research, including from the OECD and the IMF, suggests that under such conditions of stagnant growth and zero interest rates, borrowing to spend on public investment is likely to ‘crowd in’ (that is, stimulate) instead of ‘crowd out’ private investment, as it would improve the growth prospects of an economy by also increasing expected returns on private investment.

Thirdly, the functioning of these channels seems to be different from country to country (what may work in a certain way in one case may not work in the same way, if at all, in another). Considering the issue on a case-by-case basis therefore offers the possibility of a greater understanding.

Even researchers who question the negative link between high debt and output growth argue, however, that the lack of robust evidence in its favour does not mean that high public debt as a share of GDP should not be a matter of concern. However, a better way to frame the debate on the policy options is when, how and how fast it should be brought down and how to balance the long-term risks from high debt with the shorter-term risks of fiscal austerity for output growth and ultimately debt sustainability.

On the other hand, a high public debt/GDP ratio may reflect recent public investment which in the medium- to long-run may allow an economy to produce more and with fewer resources. Other things being equal, this should result in both higher growth and in lower debt/GDP. The relative weight of these considerations also depends on the level of interest rates.

### 2.7.1 Can public debt be too low?

Yes, although again it is difficult to give a specific figure of how low is ‘low’. Still, to the extent that a government may finance public infrastructure investment by borrowing, and given that future generations will also benefit from the infrastructure that would be in place, it makes sense that governments borrow now to invest in (capital) goods and spread the costs of that investment across generations, which is essentially what debt does insofar as future taxes will be used to pay debt incurred today. In that respect, if a government does not invest sufficiently, it may have ‘too low’ a debt. A currently prominent example is Germany, where due to the ‘black zero’ constitutionally enshrined commitment to balance the government’s budget balance, the level of public investment has remained low, and in many areas infrastructure is of subpar quality (as mentioned even by *The Economist* in 2017).

# 3.

## Options for managing public debt: their advantages and disadvantages

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### 3.1 How has high public debt been reduced in the past? What does historical experience suggest?

Recent research on past experiences<sup>10</sup> of reducing public debt (Reinhart *et al.* 2015) summarises seven ways in which high public debt burdens have been reduced in the past: economic growth, fiscal primary surpluses (that is, government revenues exceeding government expenditure excluding interest payments in a year), the privatisation of government assets, financial repression, taxing wealth, generating unexpected inflation, and the restructuring (that is, the change in the terms) of debt contracts (bonds). While economic growth is quite evidently the most benign of these means in reversing high public debt/GDP ratios, it is not always the most available option. Reinhart and colleagues found that although during peacetime running budget surpluses has been the most common way of bringing down public debt, this is not as effective when nominal interest rates are falling, as in the current situation. They also state that debt restructuring has in the past, especially between and right after wars, been much more commonplace than we currently tend to think and that following an initial period of turmoil and recession, debt restructuring (see Glossary for definition) has demonstrated ‘growth dividends’.

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10. The researchers used evidence from 22 advanced countries from 1800 to 2014.

## 3.2 Remediating the institutional incompleteness of the EMU

### 3.2.1 Common bonds in the eurozone

Over the course of the eurozone crisis, a number of proposals for issuing common public bonds (that is, common public debt) have been made. In the recent European Commission reflection paper on the ‘Deepening of the Economic and Monetary Union’, there is a mention of creating a common ‘safe asset’. If such bonds were to be issued, they would be a step towards the completion of the monetary union. Such common bonds would be likely to have two effects. First, they would reassure the sovereign bond markets that the Member States of the eurozone are willing to pool their fiscal resources and would therefore mitigate perceptions about the risk of default of certain eurozone governments. Secondly, given that the bonds would be jointly issued, the European Central Bank would implicitly guarantee their servicing. In other words, issuing common bonds should help reduce the (average) risk premium that governments face in financing their debt and avert liquidity crises, which through self-fulfilling prophecies could become sustainability crises.

However, the issuing of common bonds does not come without problems. One such problem is that lower risk premiums – the part of the interest rate that relates to the likelihood that a government will default – may encourage some governments to borrow more than they should, enjoying the joint guarantee of other eurozone Member States. Moreover, issuing common bonds among Member States with the variability in creditworthiness of, on the one hand, Germany, Austria, the Netherlands and Finland, and, on the other hand, of Greece, Italy and Portugal may not be optimal for the former group. One indicator of creditworthiness are the ratings of credit rating agencies. Mixing the riskiness of the two groups into one bond would result in the former group of ‘creditworthy’ countries seeing their ratings reduced. These problems have been addressed by proposals on how to issue common bonds, which we briefly discuss below. However, the resistance of Member States with highly rated public debt bonds has been fierce. In its recent reflection paper on ‘Deepening the EMU’, the European Commission appears to have heeded this opposition, as no version of ‘common bonds’ is proposed as part of the fiscal union it suggests (European Commission 2017).

#### **The Bruegel proposal: blue Eurobonds and red national bonds**

Two of the most widely discussed proposals came from Bruegel and De Grauwe-Moesen. The Bruegel proposal stated that common bonds (Eurobonds) could be issued for up to 60% of GDP for each Member State (that is, the SGP limit). The ‘blue’ bonds, as they would have been called, would enjoy lower interest rates as, in guaranteeing them, all Member States would be pooled together. Any debt above 60% of GDP would have to be issued nationally, as the Member States that were more heavily indebted would be perceived as riskier for default; these ‘red’ bonds would be issued at much higher interest rates. In that respect, governments would have strong incentives to bring their debt/GDP ratios down to 60% so that they could borrow under ‘blue’ rather than ‘red’ bonds. Some suggested that in fact the interest rate on ‘red’ bonds would be higher than what Member States with high

debt/GDP ratios currently pay. This is because defaulting on these bonds would be more likely than defaulting on the 'blue' bonds.

In essence, what this distinction between blue and red bonds should do is raise the cost of borrowing above the 60% of GDP threshold. Taken together, the blue and red bonds issued by one government should on average reflect the interest rate that it would have paid on its own debt even without them but also provide powerful incentives to stay close to or below 60% of GDP. However, a criticism has been that because of the protection that such an arrangement would provide to 'profligate' governments, even their average cost of borrowing would decline, thus permitting them to borrow more than they should.

### **The De Grauwe-Moesen proposal**

An alternative proposal was provided by De Grauwe and Moesen. According to them, Member States should pay variable fees in order to be allowed to participate in the issuing of 'blue' bonds, according to their fiscal position. Thus, governments with high public debt should be charged higher fees than those with lower debts. This should vary the cost of participating in the Eurobonds and create incentives for governments to keep their debts low. Countries with lower debt would pay lower fees, making their participation more attractive to them.

### **The Varoufakis-Holland 'modest proposal'**

Another proposal for relieving the debt burden of eurozone governments involving the creation of Eurobonds has been outlined by Varoufakis and Holland. They suggested that national debt up to 60% of GDP be transferred to the ECB. The ECB, an institution that can never default, could issue bonds to borrow, on behalf of Member States, amounts of up to 60% of GDP of all Member States. Given the lack of default risk, the interest rates at which it could issue bonds would be much lower than the ones at which Member States, especially highly indebted ones, can borrow at. To avoid any questions of 'transfers' across Member States, the Member States will continue to service their debt with the ECB by paying it the coupons of the bonds it has issued on their behalf. Having eliminated the default risk from the up-to-60%-of-GDP part of the public debt, Member States would be able to borrow to finance the part of their public debt above 60% of their GDP; but as this would now be much lower, even for countries like Greece, the interest rate at which they could borrow would also be much lower. Therefore, this proposal has a 'transfer of public debt to Europe' element that would result in lower borrowing costs for Member States and lower debt servicing costs. If implemented, this proposal would still produce differentiation between the interest rates and debt servicing costs for different Member States, depending on the state of their public finances, and it would also avoid the possibility of any transfers across Member States (Varoufakis and Holland 2011).

### European Debt Redemption Fund (German Council of Economic Advisors)

The idea of a European Redemption Fund (ERF) proposed by the German Council of Economic Advisors bears some similarities to the previous proposals, most notably the separation of national public debt into two parts: up to 60% of GDP and above 60% of GDP. In this case, however, it is proposed that the part of the debt above 60% of GDP be transferred to a 'European Redemption Fund' (so it would be 'mutualised'). This fund would issue bonds on behalf of Member States and, thanks to the several and joint guarantees provided by all Member States, it would afford Member States lower interest rates for their debt above 60% of their GDP. Member States would continue to service their debt for the bonds issued by the Fund (Doluca *et al.* 2012).

However, such a mutualisation of debt would come with very strict conditions attached. Member States that participate would have to earmark the revenue of a designated tax for fulfilling the payment obligations, deposit collaterals (that is, assets of equal value to the borrowing as guarantee) and an obligation to commit to consolidation and structural reforms. After transferring excessive debt into the ERF, there would be an obligation that the remaining national debt must thereafter not again exceed a level of 60% of GDP. To this end, debt brakes would be introduced in all participating countries based on the German and Swiss models. In particular, after a transition period, these debt brakes must constrain the structural deficit below the level of 0.5% of GDP set out in the SGP (Doluca *et al.* 2012: 1). Member States which have been bailed out can only participate after they have completed their economic adjustment programmes.

#### 3.2.2 A Euro Treasury (Bibow)

Another proposal has been the establishment of a Euro Treasury that would pool future public investment spending for the eurozone (Bibow 2014). The Euro Treasury would issue Euro Treasury securities (that is, bonds) and use the funds thus raised to provide grants to Member States in proportion to each Member State's share of the total GDP of the eurozone. The Euro Treasury would be allowed to tax Member States, again in proportion to their share of GDP, in order to service its debt (which it will have created by issuing bonds to fund grants for public investment to Member States). In this respect, it would not amount to a 'transfer union'.

The expenditure levels of the Euro Treasury would be subject to strict rules. In other words, its spending would not be discretionary. Both the initial eurozone-wide total spending levels and their subsequent growth would be agreed upon by national governments in advance, with a goal of eventually reaching a target for the common debt, for example at 60% of the eurozone GDP.

### 3.2.3 Establishing a banking union

#### **How can banking and public debt problems be connected?**

There are two ways in which banks and governments are connected. Domestic banks often hold large amounts of government bonds in their portfolios as assets. If the capacity of a government to keep on servicing its debt is questioned in the financial markets, then the price of its bonds will fall, which reduces the value of those bonds as assets. If, even worse, a government defaults or has to restructure its debt, then the value of its bonds drops dramatically. This means that the value of the assets that domestic banks hold falls, depending on how many of these bonds they had in their portfolio. If the value of a bank's assets falls so much that they are not sufficient to support its liabilities, then the bank will either have to be recapitalised or resolved (that is, shut down and its assets liquidated). Typically, such procedures are financed by the ministry of finance. Similarly, if a bank is in trouble (that is, it does not have sufficient capital to support its activities), then the government of the country in which it has been licensed will have to bail it out. This is a costly endeavour.

Therefore, when a country is in distress in the financial markets (that is, the creditworthiness of its government is questioned and the interest rate at which it can borrow rises), then questions may also arise on the health of banks holding large quantities of its bonds as assets<sup>11</sup>. If the balance sheet health of one or more banks in a country is questioned, then it becomes more likely that the government of that country will have to inject capital into them, which then raises questions about its capacity to do so and to keep on servicing its own debt. Ireland in 2010 is a prime example of this latter eventuality.

#### **What is the rationale behind establishing a banking union in the eurozone?**

The logic of establishing a banking union in the eurozone (it would also be open on a voluntary basis to Member States outside the eurozone) is to share the burden of dealing with banking crises in one or more Member States, as the effects of such crises have the potential to spill over into other Member States. Resolving banking crises comes at a large fiscal cost. As mentioned earlier there is a feedback loop between banking and public debt crises due to the fact that financial institutions often hold large sovereign debt bonds as assets, and that governments are typically responsible for bailing out national banking systems when they are in trouble. A banking union would ideally break that loop by lightening the burden carried by individual governments. This would be all the more important as the continued existence of national fiscal budgets is a source of fragility in the eurozone: in the case of a recession, the combination of national government budgets and bonds and financial integration (meaning that government bonds of different Member States

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11. A well-known example of banks' balance sheets coming under pressure are German and French banks in late 2009 and early 2010 when the price of Greek government bonds plunged as Greece entered its debt crisis. Should Greece have defaulted at the time, the German and French governments would have had to spend substantial amounts of money recapitalising German and French banks which held large amounts of Greek bonds in their portfolios.

are easily bought and sold across internal borders in the eurozone) can generate a negative spiral that results in a liquidity or solvency crisis for a government.

**If this is such a good idea, why don't we just create a full banking union?**

As banks may get into trouble if sovereign debt is critically high or because the supervision of the banking system has not been adequate, establishing a banking union when Member States are not in favour of inter-state transfers can create problems of 'moral hazard'. To put it simply, Member States would not like to subsidise the bailout of another national banking system in the eurozone if its crisis was caused by reckless borrowing by a national government. This is why rules have been put into place which stipulate that recourse to common eurozone resources will only be available after resources from the Member States have already been invested in the bank bailout and still proved insufficient (see below).

**How can we evaluate the current state of affairs with the EU banking union?**

The steps taken so far (establishment of a single supervisory mechanism, a single resolution mechanism and a single resolution fund) have mostly been in the right direction, albeit in most cases incomplete and subject to procedures that are almost bound to reduce their effectiveness. More is needed regarding the size and pooling of common resources for the Single Resolution Fund, as well as the establishment of a European Deposit Insurance Scheme and a Common Insurance Guarantee scheme across the eurozone. Given the political obstacles, it is likely to take some time for these developments to materialise. However, given the lack of appetite for further political integration, completing the Banking Union is considered a minimum necessary condition for stabilising the eurozone and lightening the burden on governments of managing their debt.

### **3.3 Sovereign debt default**

#### **3.3.1 What are the costs and benefits of defaulting on public debt?**

A government defaults when it decides not to service some or all of its debt obligations (that is, payment of coupons and principal at pre-specified times). There are costs and benefits to defaulting.

Borensztein and Panizza (2008) identify four types of costs of sovereign default: reputational costs, costs from being excluded from international trade, costs to the domestic economy through the financial system, and political costs for the authorities. If a government defaults at one point, then in the future, when it seeks to borrow again, prospective investors may perceive it as 'highly risky' and be unwilling to buy its bonds as investment, unless a high enough interest rate is offered to cover such risk. Other things being equal, a default would therefore raise the future costs of borrowing to finance government deficits ('reputational costs').

Empirical evidence provided by the above authors using data for 149 countries from the 1990s and up to 2002 suggests that reputational costs of default (in terms of having access to international financial markets) do exist. The credit rating (an indicator of a government's creditworthiness) drops, whereas the interest rates (the sovereign spreads) at which the government can borrow rise by at least 0.4 percentage points. However, the authors also find that these effects disappear after 3-5 years and are therefore considered 'short-lived'.

Borensztein and Panizza also find tentative evidence that sovereign defaults are associated with a higher probability of having a banking crisis. The link between the two has to do with the fact that domestic banks, especially in emerging economies, tend to be large holders of government bonds. If the government defaults, the value of these bonds falls dramatically, creating a problem in the balance sheet of banks (see p. 37 above).

It should be noted that the data which the authors use does not include observations for the eurozone. This is an important caveat in assessing the costs of default for the (domestic) banking system. On the one hand, if a sovereign default were to trigger a crisis in domestic banks, this crisis would be likely to spread to the banking systems of other Member States, due to financial market integration and the international cross-holdings of banks. On the other hand, even if the crisis was limited to the territory of the government which defaulted, the domestic banks would need recapitalisation (see Glossary under 'Bail-in'). Recapitalisations carry high fiscal costs. Moreover, a typical practice in such cases is that the government issues bonds which it then hands over to the banks, which in turn submit them as collateral to the central bank in order to draw liquidity (cf. Davies 2015a; Davies 2015b). In the case of the eurozone, the ECB has been highly reluctant to accept such bonds in exchange for liquidity to a Member State's banks. This means that either an extended bank holiday would have to be imposed, the Member State would have to exit the eurozone and start reprinting its own currency to recapitalise the banks, or a bail-in of bank bondholders and depositors would have to be imposed; or a combination of these three options. Needless to say, all three options are highly costly, both economically and politically, especially in economies where businesses rely significantly on banks for their financing<sup>12</sup>.

The benefits of default have to do with the fact that a government will have less debt to service in its aftermath. This means that it will have to borrow less to roll over its existing debt (which will now be lower) and will have to produce smaller surpluses or for a shorter period of time in order to reduce its debt. Given that fiscal austerity can be harmful economically and politically, these are not insignificant benefits. The size of these benefits, however, depends on whether investors have been expecting the default or not. If they have, then they will have started selling off the bonds of the government, reducing their price and increasing the interest rate at which the government can borrow. This would increase the costs of borrowing and potentially put pressure on the government budget deficit to expand. This is

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12. For an account of the potential costs for Greece (and potentially other members) of exiting the eurozone, see Varoufakis 2012; Iordanoglou and Matsaganis 2017.

likely to prompt more fiscal austerity. In such a case, the benefits from defaulting are greater than if the default had been unexpected (De Grauwe 2014).

### 3.4 Debt auditing

Public debt audits have emerged as a tool for questioning the legitimacy of outstanding public debt. Such initiatives began in the ‘global south’ and since the recent crisis have also been launched in Europe. Examples include audits that have taken place in Argentina, Rwanda, the Democratic Republic of Congo, South Africa, Brazil, the Philippines, Paraguay, Zimbabwe and Ecuador, but also in Spain, France and Belgium. The objective of such debt audits is to question the legitimacy, legality and odiousness of public debt and thus provide moral/political arguments in favour of debt forgiveness/restructuring. They also aim at educating citizens on the origins of public debt whose servicing they are often called upon to shoulder through fiscal austerity policies.

Underlying these debt audit initiatives is the notion that public indebtedness has increased due to the necessity to bail out irresponsibly behaving financial institutions which tend to privatise profits and socialise losses. More generally, it has been argued that measures that deal with sovereign debt problems are dominated by creditors and fail to discipline lenders, thus preventing them from irresponsible lending in the future. Meanwhile, governments saddled by debt have to divert resources from social spending and public services to debt servicing, often resulting in failure to provide even the basics in terms of healthcare to their populations. The IMF has recently issued warnings on this in the case of Greece.

Ecuador has been a prominent case where an integral public debt audit took place between 2007 and 2008 and preceded a unilateral suspension of payments of part of the country’s debt in 2009. Following this suspension, Ecuador’s creditors eventually agreed to a substantial haircut in the nominal value of the outstanding public debt bonds and the interests associated with it up to the year 2030. According to some estimations, Ecuador saved USD 7 billion.

In Europe, perhaps the most famous recent debt auditing initiative was the work by the ‘Truth Committee on Public Debt’ launched by the then Greek Parliament speaker Zoe Konstantopoulou in 2015. The establishment and work of the committee caused controversy in Greece while being ignored by Greece’s lenders, not least because the government that took office shortly after the publication of the first preliminary report of the committee and after the Greek referendum in the summer of 2015 promptly dissolved it and took the matter no further. The controversy related to the fact that the scrutiny of the committee was limited to the period after 2010, when the crisis had already erupted, even though a cursory look at the data on the evolution of public debt in Greece shows that not only has it been a chronic problem but also that successful efforts to reverse it in the late 1990s and early 2000s were completely abandoned from 2005 onwards, when there was an explosive rise even though the Greek economy was growing. These controversies

illustrate how the credibility of such initiatives may easily be compromised by domestic politicking.

The actual effects of using the results from such exercises to *unilaterally* stop servicing debt are subject to limitations. For one, sovereign bonds are often subject to international law which protects investors. If a government unilaterally decides to stop servicing its debt on the basis of a domestically produced report concluding that it is odious or illegal or illegitimate, then it will almost certainly be taken to an international court by its lenders for arbitration, where such arguments are unlikely to fare well. Moreover, it is also plausible that the precedent of a national committee declaring public debt illegal, illegitimate and odious to justify default may in the future add to the risk premium paid by the government to borrow. Ultimately, that would increase the costs of future borrowing and financing public investment.

Does this mean that debt auditing exercises are pointless? No. For one, it is clear even to international organisations such as the IMF (in the case of Greece) and to mainstream academic economists that some debt restructuring is eventually inevitable in order to lighten the burden of public debt on eurozone economies and allow their governments to use their fiscal tools to reboot growth. Such debt forgiveness, however, would be best undertaken multilaterally and in a concerted manner. Debt audits can change the currently asymmetric balance of power between lenders and debtors in favour of the latter. At least equally importantly, however, such debt auditing initiatives should be complemented by initiatives to increase internationally coordinated regulations that will prevent lenders from irresponsibly lending to governments (what is called ‘macro-prudential regulation’). The current juncture seems to have shaken the view previously held by influential economists, even in the mainstream, on the merits of financial deregulation, although for some powerful politicians this view still holds (for example, the President of the United States).

## Annex 1

### Definitions of government budget deficit

The general budget balance (the one directly observed) can be decomposed into a part that is the outcome of the function of automatic stabilisers and a part that is the outcome of discretionary fiscal policy actions. The part of the primary budget balance that is net of the effect of automatic stabilisers is called *cyclically adjusted* or *structural* budget balance (surplus or deficit) and shows the ‘fiscal effort’ of the government.

We can write

$$\begin{aligned} \text{expenditures} - \text{tax revenues} &\equiv \text{primary budget balance} \\ \text{primary budget balance} &\equiv \text{impact of automatic stabilisers} + \text{discretionary fiscal effort} \end{aligned}$$

or

$$\text{cyclically adjusted or structural budget balance} \equiv \text{primary budget balance} - \text{impact of automatic stabilisers}$$

or

$$\text{discretionary fiscal effort} \equiv \text{primary budget balance} - \text{impact of automatic stabilisers}$$

Note:  $\equiv$  means: is always equal to.

For more details, see Carlin and Soskice 2015: 514.

The public debt increases every time (that is, every year) a government has a budget deficit, meaning its tax revenues for the year are lower than its expenditures. These expenditures include interest payments on outstanding debt. Participation in the EMU is likely to result in higher deficit expansion and, thereby, a higher debt/GDP increase, for a given negative shock to output than non-participation. This is because the EMU Member State would be less able to counter the negative shock to its economy due to restrictions in fiscal policy and the one-size-fits-all monetary policy which may not respond adequately to shocks in one or few countries alone.

## Annex 2

### What determines the evolution over time of the public debt/GDP ratio? A more formal analysis

To understand what determines the evolution over time of the public debt/GDP ratio, we need to reconsider the budget identity of the government. As mentioned above, at year  $t$ ,

nominal expenditures + interest payments on outstanding public debt  
is always equal to  
nominal tax revenues + new bonds + new money

In symbols,

$$G_t + (i_t \times B_{t-1}) \equiv T_t + \Delta B_t + \Delta M_t$$

where  $G_t$  are nominal expenditures,  $i_t$  is the nominal interest rate,  $B_{t-1}$  is the outstanding debt in the previous period,  $T_t$  are nominal tax revenues, and  $\Delta B_t$  is the value of new bonds (borrowing, new debt) issued. Printing money ( $\Delta M$ ) is excluded in the case of the EMU and is, therefore, equal to zero.

Starting from the above identity (which always holds) and given that the standard measure of public debt is the debt/GDP ratio, we can rearrange the above identity to arrive at the following statement:

change of public debt/GDP over time  
is equal to  
(primary budget deficit/GDP) + (real interest rate paid on debt – growth rate  
of real GDP) x (public debt/GDP)

Or, in symbols,

$$\Delta b = d + (r - \gamma_y) \times b,$$

where  $\Delta b$  is the change over time of the public debt/GDP ratio,  $d$  is the primary budget deficit as a share of GDP,  $r$  is the real interest rate paid on the outstanding public debt,  $\gamma_y$  is the real GDP growth rate and  $b$  is the public debt/GDP ratio. If the public debt/GDP ratio does not change, then  $\Delta b$  is zero.

## Glossary of terms

**Bail-in:** Passing the cost of increasing the capital of a bank ('bank recapitalisation') to those that have lent money to it (that is, its bondholders, by buying its bonds) or/and to its depositors (that is, those who have deposited money into the bank) by using part of the value of their investment or deposits to the bank in order to improve its asset (capital)-liabilities balance (compare with 'bail-out', when money for recapitalisation comes from outside the bank; for example, from the government).

**Bond:** A government bond is a financial instrument that a government sells to investors when it wishes to borrow money. A bond makes a promise to repay the principal (that is, the amount that was borrowed) after a certain number of months or years and to pay out a specific amount of money as interest regularly to the lender for a specific amount of time (the duration of the bond). This regular fixed amount of money to be paid to the lender/holder of the bond until its expiration is called the 'coupon'. Coupons are fixed for a given bond. Given the fact that bonds generate income for those who own them, they are assets.

**Contingent liabilities (of a government):** These are payment 'obligations that do not arise unless particular events occur in the future' (IMF 2011). Contingent liabilities are different from the *direct* liabilities (for example, government bonds), where the settlement date (that is, the date when the principal will be paid back) is fixed at the time when the nominal obligation is set (when the bond is issued) (Towe 1991 as cited in; Bova *et al.* 2016). Contingent liabilities can be divided into explicit and implicit ones. Explicit contingent liabilities entail obligations that have been set by a particular law or contract, for example: state guarantees for various types of loans (mortgages, student and small business loans); state insurance schemes (for example, for commercial bank deposits, minimum returns from private pension funds, to protect farmers against floods or droughts, for airline disaster or war risk); and state guarantees as part of public-private partnership programmes. Implicit contingent liabilities include bank failure, investment failure of a non-guaranteed pension fund, employment fund or social security fund, environmental damage, disaster relief and military financing (Bova *et al.* 2016). The materialisation of contingent liabilities can have fiscal costs, whereby a government has to pay expenses which would change its financial condition (that is, its budget balance and/or its public debt). Examples include the need to bail out one or more banks, provide assistance in case of a natural disaster (for example, an earthquake) or assume the debt of a troubled state-owned enterprise (Bova *et al.* 2016). Contingent liabilities can explain why international organisations, such as the European Commission, often scrutinise and put pressure on governments to reduce the public budget costs of, for example, pension systems.

**Debt overhang:** A situation in which the government has such a high outstanding debt stock that it finds it difficult to borrow even in order to finance projects (for example, public investment), which would in principle pay for themselves.

**Debt profile:** This refers to the characteristics of the outstanding bonds or, more specifically, the dates when coupons and principal (that is, the originally borrowed amount of money) are due. They depend on the duration of a loan made through a bond (for example, 3 months or 3 or 10 years) and the promise of frequency of interest payments.

**Debt restructuring:** This involves the changes in the terms of a loan/bond usually in order to lighten the burden of debt servicing or repayment for the borrower. Such changes in terms may include a write-down (or 'haircut') of the amount borrowed and due to be repaid, the suspension of some coupon (interest) payments for some time or indefinitely, the change (usually a lengthening) of the schedule of payments of interest and/or the principal (that is, the amount originally borrowed through a bond).

**Debt roll-over:** When bonds expire or when coupons (interest) need to be paid, governments very often borrow again to make the necessary payments, thus renewing ('rolling over') their debt.

**European Financial Stability Facility (EFSF):** The European Financial Stability Facility (EFSF) was created as a temporary crisis resolution mechanism by the euro area Member States in June 2010. The EFSF has provided financial assistance to Ireland, Portugal and Greece. The assistance was financed by the EFSF through the issuance of EFSF bonds and other debt instruments on capital markets. The EFSF does not provide any further financial assistance, as this task is now performed solely by the European Stability Mechanism.

**European Stability Mechanism:** The European Stability Mechanism (ESM) was set up in October 2012 as a successor to the EFSF. It is a permanent solution for a problem that arose early in the sovereign debt crisis: the lack of a backstop for euro area countries no longer able to tap the markets. The mission of both the EFSF and ESM is to safeguard financial stability in Europe by providing financial assistance to countries of the euro area. The EFSF and ESM remain separate legal entities but share staff, facilities, and operations. Together, the EFSF and the ESM had EUR 700 billion in firepower.

**Excessive deficit procedure (EDP):** This is the corrective arm of the Stability and Growth Pact, that is, the procedure under which Member States are placed if they breach the Stability and Growth Pact rules.

**Government debt:** The stock of government bonds that have been sold to the private sector in the past (Carlin and Soskice 2015, 516-7) and are still outstanding. This debt reflects the borrowing that has been undertaken *over the years* in order to finance the expenditure plans of a government that were not covered by tax revenues, as well as to pay the interest on previous loans.

**Gross public debt:** A measurement of public debt which does not take into account the financial assets that a country/government owns and which are likely to provide returns that pay for its outstanding debt. Net public debt takes these assets into account in measuring public debt (see also **Net public debt**). The difference between gross and net debt can be very large. For example, Panizza and Presbitero (2013, p.15), using OECD data, report that in 2012 the average difference between gross and net public debt as shares of GDP in the OECD group was 39.1 percentage points (37.4 in the euro area). In eight countries of the group the difference between gross and net public debt was more than 50 percentage points, whereas in two (Finland and Norway), the difference was more than 100 percentage points. Large differences between net and gross public debt may sometimes be due to the fact that governments hold their own bonds, for example if some social security fund holds government debt bonds, although it is also possible that such differences are due to the existence of sovereign wealth funds<sup>13</sup>. However, as calculating net debt would require an accurate assessment of a government's assets and liabilities, an exercise fraught with conceptual and practical challenges, the use of gross debt has become predominant, also for international comparability purposes.

**Net public debt:** A measurement of debt which takes into account the financial assets that a country/government owns and which are likely to provide returns that pay for its outstanding debt (see also **Gross public debt**).

**Primary financial (bond) market:** The market in which a government first issues (that is, sells) a bond (see above under 'Bond'). The act of first issuing a bond is the act of borrowing money from investors. Once a bond has been issued, then it is a financial asset for the investor that holds because it contains the promise of future revenues: the borrower (a government in this case) promises to pay interest ('coupons') at regular, specified intervals, and also the original amount borrowed (the 'principal') at the expiry of the bond.

**Secondary financial (bond) market:** The financial market in which government bonds can be bought and sold *after* they have been issued.

**Structural (government budget) balance:** This is the difference between a government's expenditure and revenues that are under its discretion (see also Annex 1 above). In practice, it is a government's budget deficit (or surplus), once the effects of automatic stabilisers have been deducted from it.

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13. A sovereign wealth fund (SWF) is a state-owned investment fund, investing in real and financial assets such as stocks, bonds, real estate, precious metals, or in alternative investments such as private equity funds or hedge funds. Sovereign wealth funds invest globally. Most SWFs are funded by revenues from commodity exports or from foreign-exchange reserves held by the central bank (Wikipedia).

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