

# EU FISCAL RULES: TIME FOR A REBOOT

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<b>EB</b>	Expenditure benchmark
<b>ECB</b>	European Central Bank
<b>EDP</b>	Excessive Deficit Procedure
<b>EGD</b>	European Green Deal
<b>GFCF</b>	Gross fixed capital formation
<b>LPI</b>	Logistics performance index
<b>MIP</b>	Macroeconomic imbalance procedure
<b>MTO</b>	Medium-term objective
<b>NAWRU</b>	Non-accelerating rate of unemployment
<b>OG</b>	Output gap
<b>OR</b>	Odds ratio
<b>RRF</b>	Recovery and Resilience Facility
<b>SGP</b>	Stability and Growth Pact
<b>TFP</b>	Total factor productivity
<b>TSCG</b>	Treaty on Stability, Coordination, and Governance
<b>WEF</b>	World Economic Forum

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# **EXECUTIVE SUMMARY**

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# EXECUTIVE SUMMARY

The EU fiscal rules are one of if not the most important aspects of EU economic policymaking. Over the years, they have grown more complicated and difficult to understand. They have often been breached by member states and have proven inadequate at preventing the emergence of sovereign crises. With the world now much changed since the rules were originally formulated, not least due to Covid-19 and an impending climate catastrophe, it is unanimously agreed that they are in need of major reform.

This policy study looks at how the rules may be reformed based on a number of guiding principles. One is that the rules should ensure the sustainability of public finances across member states and prevent sovereign debt stress. A second principle is that the fiscal rules should facilitate Europe's public investment challenges in the coming years, especially in relation to climate change. Another principle is fairness – macroeconomic policy should not magnify inequalities within countries or inequality between countries. Finally, any reforms proposed should be politically feasible.

This study shows that Europe's highest-income countries were major users of public investment historically. The conditions faced by Europe in the post-war period necessitated very high levels of public investment, which countries met through major increases in public spending. All of Europe's member states now once again require major increases in public and private investment, particularly to meet emissions targets. However, it is Europe's less-well-off regions, such as new member states and southern European countries, that face the greatest challenges today. The fiscal rules in their current form cannot meet those challenges.

As the rules have changed much since their introduction, the policy landscape continues to be fast-moving. The latest proposals represent a

significant improvement on the current framework. Reference to unobservable and poorly measured indicators, such as structural deficits and output, have very much been relegated to the background. The economically and politically unrealistic debt-reduction rule has been removed. In its place, the Commission proposes to tailor debt-reduction paths to country-specific circumstances, for those member states deemed to be at risk.

While an improvement, the original targets of a debt to GDP ratio of no more than 60% and a deficit no greater than 3% remain. As this study details, these values were arbitrarily chosen based on conditions that prevailed in the 1980s. Economies now suffer from secular stagnation and interest rates are to remain structurally low, notwithstanding recent inflationary pressures.

We argue that the level of debt and the size of the annual deficit are limited measures of public financial sustainability, conceptually and empirically. They are poor measures of the cost of bearing debt, particularly in recent times – governments can essentially rollover debt continuously. We contend that interest payments to GDP or the burden of servicing debt offers a more useful metric of public financial sustainability. Empirical evidence is presented to this effect.

The most sensible reform of the fiscal rules would, therefore, focus on the debt-servicing burden as the key indicator. Given political realities within the EU, such an overhaul is unlikely to be realised. We therefore suggest a number of less ambitious recommendations, which would be welcome, although not ideal. This includes raising the public debt target from 60% to 100%. The removal of said unobservables in the most recent proposal by the Commission – output gaps and structural balances – would be very much welcome. Similarly, the 1/20th



debt-reduction target is unrealistic and its abolition is needed.

Tailoring debt reduction to individual contexts and making allowances for green and other types of public investment is a positive move. But given the fact that countries with the highest debt, such as southern European countries, are often those with greatest investment needs, the recent reforms are likely to prove inadequate. The EU should build on the Next-Generation EU model and establish a permanent climate investment fund. Only then will the existential challenge of meeting emissions targets be insulated against political-economic pressures, namely, the limitations imposed by supranational rules and domestic distribution struggles.

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# 1. INTRODUCTION

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# 1. INTRODUCTION

The Covid-19 crisis constituted an unprecedented economic shock, the effects of which are still felt today. It caused major disruption to economic activity and is likely to have long-term scarring effects. To limit the negative economic impact of the pandemic, monetary and fiscal authorities across the EU put in place a series of measures that were unprecedented in the recent history of Europe. This includes large fiscal supports to both households and businesses, monetary easing, and European Central Bank (ECB) purchases of government bonds.

Enshrined in the Stability and Growth Pact (SGP) and its various amendments, the EU's regime of fiscal governance is perhaps the strictest and most conservative of any region or major nation in the developed world. Accordingly, the crisis triggered a suspension of the fiscal rules to manage the fallout from the damage caused by the pandemic. Activation of the fiscal rules' "general escape clause" enabled member states to cushion the negative effects of the economic recession. The result has been widening budget deficits and a steep increase in public debt levels.

The future of the fiscal rules remains highly uncertain. The general escape clause is expected to be deactivated after 2023, but it is unclear in what form the rules will be reinstated. It is widely recognised that the fiscal rules are not fit for purpose. They are considered to be overly complex, based on unobservable variables – not grounded in sound economic principles – poorly governed and incapable of meeting Europe's challenges in the coming years. Applying the rules of the SGP and the Treaty on Stability, Coordination and Governance (TSCG), also known as the fiscal compact rules, would require very large fiscal consolidation, especially in countries most affected by the pandemic crisis.

This policy study examines what reforms can be made to the fiscal rules. The reforms proposed

in this policy study are guided by a number of principles. The first is that of public financial sustainability, which is the main rationale for the rules, as originally conceived. Previous iterations of Europe's fiscal rules failed to prevent debt problems and debt crises. A second principle is that the fiscal rules should facilitate Europe's public investment challenges in the coming years, especially in relation to climate change. Another principle is fairness – macroeconomic policy should not magnify inequalities within countries or inequality between countries. We shall see that high levels of public investment have been used by rich countries in the past, but that the rules now limit it, which impacts less-well-off regions more. Finally, the policy study is attuned to the political realities of the EU. It sets out several high-level reforms that are most desirable, but less likely to be implemented and, in addition, less-far-reaching reforms based on the current trajectory of policymaking within the union.

The policy study is organised as follows. The next section provides a critical overview of the fiscal rules, their historical development and current make-up. Section 3 examines the historic use of public investment in the EU and some of Europe's most-pressing investment needs. Section 4 looks at the relevance of the continued use of debt and deficits in an era of low interest rates and issues surrounding debt servicing. Section 5 presents some econometric evidence of the predictors of sovereign stress. Section 6 discusses the results and makes a series of policy recommendations.

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## **2. TIMELINE: THE PAST AND PRESENT OF FISCAL GOVERNANCE**

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## 2. TIMELINE: THE PAST AND PRESENT OF FISCAL GOVERNANCE

### 2.1 Early years

To adopt the euro, all member states were required to fulfil four conditions, known as the convergence criteria, agreed upon in Maastricht in 1991. They consisted of a set of macroeconomic indicators, focusing on price stability, long-term interest rates, exchange-rate stability, and sustainable and sound public finances. Importantly, the Maastricht Treaty was based on two key reference values, which still represent the core of the EU fiscal rules – public deficits must not exceed 3% of GDP and public debt should be below 60% of GDP. The reference values are specified in a protocol annexed to the Treaty.

The value of 60% reflected the average value prevailing among relevant countries at the time of drawing up of the Treaty – with Germany and France registering a value close to the target. As outlined in Box 1, the 3% rule emerged from the 60% rule based on certain assumptions around growth and inflation rates. While few countries were in breach of the deficit threshold, several countries had debt levels above 60%. Given the difficulties of requiring an immediate adjustment, a higher debt to GDP ratio was accepted, providing that “the ratio is sufficiently diminishing and approaching the reference value at a satisfactory pace”.<sup>1</sup> Unsurprisingly, the two reference values have been extensively criticized for being too rigid and not grounded on a solid theoretical framework and/or economic rationale.<sup>2</sup>

#### Box 1. Maastricht debt and deficit rules

Equation (1) illustrates the connection between the two reference values, defined for the level of debt and deficit. It shows the relationship between the change in debt, deficit and economic growth.<sup>3</sup>

$$\Delta b = d - gb \quad (1)$$

where  $b$  is the debt to GDP ratio,  $d$  represents the overall deficit as a percentage of GDP and  $g$  is the growth of GDP in nominal terms (it can be approximated by the sum of the growth of real GDP and inflation). Intuitively, the higher the deficit, the higher the change in debt, whereas economic growth reduces the level of debt relative to output. The reduction in debt due to economic growth is greater at higher levels of debt. For instance, if there were no debt, so that the level of debt,  $b$ , were zero, there would be no change in debt due to growth.

At the time of the Maastricht criteria, an assumption of 5% nominal GDP growth (3% real and an inflation rate of 2%) was considered reasonable. Plugging in  $g=0.05$  and  $b=60$ , the average level of debt at the time, for  $\Delta b$  to be zero,  $d$  must be -3%. In other words, if the level of debt were to be prevented from rising above 60%, the deficit could not exceed 3% of GDP. It is noteworthy that these values have not been registered during the past decade.

The countries of northern Europe had strong, stable industrial bases. For Europe's less-developed southern countries, the Maastricht Treaty was grounded on the optimistic idea that countries characterized by heterogenic performance could converge towards common goals, activating a spontaneous *catching-up* process of backward regions to achieve the EU Treaty objective of economic and social cohesion.<sup>45</sup> However, as we discuss in a later Section 3, the EU's poorer countries have greater public investment needs, so the fiscal rules have, if anything, stymied rather than promoted convergence.

The main rationale for the convergence criteria, though, was to foster sound budgetary policy and reduce the tendency of national governments to run excessive deficit and debt levels over time – the so-called deficit bias. The presence of external constraints would prevent cross-border spill-over effects on other EU members (from fiscal policies to monetary policy). The idea was that, while the implementation of expansionary fiscal policies by an individual EU member stimulates its economy,<sup>67</sup> it may induce inflation, while the increase in public debt may amplify solvency risk. Higher inflation may require the ECB to raise interest rates, constraining growth in other countries, while solvency risk may spill over to other EU members. The Treaty, therefore, strictly rules out bailout commitments by the EU institutions and the ECB, so as to discourage excessive deficit spending and debt accumulation.

Despite considerable criticism from economists of all persuasions (aside from those within official institutions), the original EU rules were reinforced over time. The SGP, signed in 1997, strengthened the deficit and debt limits established by the EU Treaty and introduced a system of multilateral surveillance over fiscal policies.<sup>8</sup> The essence of the SGP is the commitment of all EU member states to achieve the “medium-term objective of budgetary positions close to balance or in surplus”. This “will allow all member states to deal with normal cyclical fluctuations, while keeping the government deficit within the reference value of 3% of GDP”. The ambition was to permit countercyclical policies during a recession,

when the fiscal deficit balance could give way to a maximum deficit of 3% of GDP.

Observance of the supranational fiscal rules is guaranteed through two processes, namely, the preventive and corrective arms. The former aims at ensuring sound public finances through submission of compliance reports and three-year fiscal plans; the latter identifies the policy responses to undertake in case of excessive deficits (and/or debts), the Excessive Deficit Procedure (EDP). Under slow growth in the late 1990s and early 2000s, the first country to breach the 3% reference value was Portugal, followed by Germany, France, the Netherlands, Greece and Italy.

The fiscal rules were duly revised, adding greater complexity to the evolving framework. In 2005, the revision of the SGP introduced the concept of differentiated, country-specific medium-term objectives (MTOs) – the budgetary target of governments over the medium term.<sup>9</sup> Previously, MTOs were defined in general terms and required member states to have budgetary positions close to balance or in surplus. The 2005 amendment was not only country-specific but defined the MTO in structural terms. Member states' structural deficit, the deficit that is independent of the business cycle, could be at most 1% of GDP. The amendment also foresaw a benchmark structural deficit adjustment of 0.5% of GDP towards the MTO every year. A higher consolidation effort is required in good economic times and a lower one in economic downturns.

In the case of exceptional circumstances, such as a severe economic downturn, negative growth rate and/or significant loss of output, and below-average growth, member states are allowed to diverge temporarily from their MTOs and to have a deficit above the 3% GDP reference value.<sup>10</sup> In this event, the deadline for correcting the deficit may be extended and account is given to national structural reforms, which are supposed to improve the long-term sustainability of public finances and to allow the country to return towards its MTO within the stability programme horizon.

The medium-term budgetary objective, therefore, became a crucial indicator for the governance framework in the euro area. By filtering out the effects of the business cycle and one-off and temporary measures, it aimed to give a more accurate

picture of the underlying financial position than the headline deficit.<sup>11</sup> However, the reform brought an unobservable variable into the EU framework, namely, the structural budget balance (Box 2).

### Box 2. Calculating the structural budget balance

As already stated, the structural budget balance is central to the MTOs in the SGP. It represents the part of the nominal budget balance that is not dependent on the business cycle, net of temporary effects and one-off budgetary measures.

Structural budget balance = nominal balance – cyclical balance – temporary/one-off measures (2)

Computing the structural balance requires identifying the cyclical component and temporary and one-time budget measures. The last of these refers to public revenues and expenditures, such as temporary tax and/or bank rescue costs, that modify the budget position. The cyclical component is given by multiplying the output gap (OG) by a budgetary elasticity coefficient ( $\varepsilon$ )<sup>12</sup> to the economic cycle.

$$\text{Cyclical component} = \text{OG} \times \text{budgetary semi-elasticity } (\varepsilon) \quad (3)$$

Generally, an increase in GDP would improve the budgetary position through higher tax revenues and lower welfare spending. If the budgetary position is highly responsive to changes in output, so that  $\varepsilon$  is large, and if the economy is operating far away from its potential level, then the cyclical component of the budget will be high. While the budgetary elasticity requires modelling, and so, is subject to estimation error, it is the computation of the OG that has aroused the most controversy.

The OG is a theoretical concept, defined as the difference between actual ( $Y$ ) and potential output ( $Y^*$ ).

$$\text{OG} = \text{nominal output} - \text{potential output} \quad (4)$$

More specifically, the calculation of the OG requires quantifying potential GDP, namely, the level of output that a country could produce by employing all resources at their long-term, sustainable, non-inflationary level (as formulated by Okun in the 1960s).<sup>13</sup> Potential output is not directly observable. It is, therefore, subject to considerable uncertainty, and its estimation is often subject to revisions. Nonetheless, it is the basis for estimating the structural budget balance and, consequently, for determining the fiscal policy target and fiscal spaces for governments across the EU.



Potential output can be estimated using different methodologies.<sup>14151617</sup> The European Commission (EC) estimates the potential output on the basis of a Cobb-Douglas production function, which links output ( $Y$ ) to the factors of production labour,  $L$ , and capital,  $K$ , and to total factor productivity (TFP) or technical progress. Formally, the relationship can be stated as follows:

$$Y = L^{\alpha} \times K^{1-\alpha} \times TFP \quad (5)$$

where  $\alpha$  is the estimated labour output elasticity and  $(1-\alpha)$  is the estimated capital output elasticity.<sup>18</sup>

The calculation of  $L$  is based on, among others, potential employment, namely, labour force corrected for the NAWRU – the non-accelerating wage inflation rate of unemployment. This is the rate of unemployment that does not induce inflation and is a measure of structural unemployment. The NAWRU is estimated using a Kalman filter method,<sup>19</sup> which separates the unemployment rate into a trend component and a structural component. The variable  $K$  is estimated as the capital stock in the previous year, adjusted for depreciation and investment. TFP entails the utilisation of inputs and their technological level, calculated through a bivariate Kalman filter model.<sup>20</sup>

To summarise, the steps involved in the calculation are as follows:

- Structural budget balance = nominal balance – cyclical balance – temporary/one-off measures
- Cyclical component = OG  $\times$  budgetary semi-elasticity
- OG = nominal output – potential output
- Potential output,  $Y = L^{\alpha} \times K^{1-\alpha} \times TFP$
- where  $L$  is potential labour,  $K$  is the capital stock and  $T$  is the technologically determined TFP
- Potential labour = trend working hours  $\times$  potential employment
- Potential employment is determined by trend participation rate and NAWRU.

## 2.2 Problems with structural-balance calculations

A number of criticisms can be levelled at the structural-balance calculations. One relates to the realism and internal consistency of aggregate production functions. Economies are highly complex human systems and determinate relationships are rarely found in the social sciences. The idea that there is a determinate, known relationship between capital, labour and output is questionable. Indeed, the development and subsequent appeal

of the Cobb-Douglas production function is more a product of its attractive mathematical properties than it being based on the observation of industrial or economic processes.

As to its internal validity, it has long been recognised that aggregate capital cannot be measured consistently.<sup>21</sup> Capital goods, like all goods, comprise many categories of items, from buildings to roads, machinery and more. Measurement of capital goods in physical terms, such as the number of different types of specific goods, would



require a long list of items and would, therefore, lack concision. Quantifying the stock of capital in monetary terms in a given year and then using it as a base year to calculate the real capital stock depends crucially on the choice of base year and the relative prices in that year. For instance, a period of technological advancement is likely to result in a fall in the price of machinery and equipment, but not structures (which are subject to limited productivity improvements), whereas a recession may affect the price of structures more. Taking a period following a productivity boom as a base year will result in a relatively low level of machinery, and a period following a recession is likely to result in a relatively low level of structures.

TFP is also subject to severe measurement problems. TFP is a measure of output relative to total inputs in production. Just as labour productivity is a measure of how efficiently labour is used, TFP is a measure of the combined use of labour and capital in the production process. It is used to decompose the contributions of technical change and the growth in production factors, namely, labour and capital, to the overall growth in output. In decomposing the various contributions of labour, capital and technical progress, one says that a given increase in output could be achieved by either a certain amount of productivity growth, growth of labour, or growth of capital. If inputs are complementary, and they typically are, this is meaningless. It is at least meaningful to say what would happen to the output of an IT firm if it increased the number of computers, holding the number of programmers constant, but it is less meaningful to say what share of output growth is due to programmers and what share is due to computers or, for that matter, due to technical change.<sup>22</sup> For these and other reasons, measurement of TFP remains elusive.<sup>23,24</sup>

Potential output is subject to estimation errors arising from the calculation of the structural component of unemployment (NAWRU). The Kalman filter approach for measuring NAWRU suffers from “endpoint bias”, as greater weight is assigned to more recent data.<sup>25</sup> This leads its measurement to be procyclical, in that structural unemployment is likely to be assessed as high in a recession and low

during a boom. Higher structural unemployment, say, means that the potential labour force is smaller, and hence, potential output is also lower. When unemployment is structural and not temporary, there is less labour available to be used and the economy is deemed to be operating closer to full capacity. This results in a decrease in the OG and an increase in the structural budget deficit, as a smaller share of the deficit is due to the economic cycle, ultimately leading to a reduction in the leeway allowed by public finance rules. In other words, unemployment may be deemed structural in a recession due to the methodology rather than the underlying labour market, resulting in less space for fiscal expansion, when most member states most need it.

Moreover, the estimated level of potential output, calculated twice a year by the Commission, is often revised after the fact. This is due to methodology changes by the Commission or when forecasted data are updated.<sup>26</sup> For instance, methodological changes occurred in 2002, 2004, 2010, 2013 and 2016.<sup>27</sup> Such revisions have significant implications and have been found to be procyclical.<sup>28</sup> This means that a downward revision of potential output in a recession decreases the OG and the fiscal space of the country.

During the boom of the 2000s, which in some countries was a bubble, estimates of the structural balance and associated variables, such as potential output, proved to be massively underestimated. In more recent years, the methodology used by the European Commission seems to underestimate the potential output, at least compared with the estimates produced by other international institutions.<sup>29</sup> This implies that some EU member states have to cope with limited fiscal flexibility, if not with enforced and inappropriate fiscal policies. After the global financial crisis of 2007-2008, the revision in the OG estimations intensified, increasing the scepticism toward fiscal rules based on cyclically adjusted variables.<sup>30</sup>

## 2.3 SGP evolution

The inability of the fiscal rules to prevent sovereign stress and default in the EU called into question their effectiveness in doing what they were designed to do. Debate on how they might be reformed once again took place and various proposals were put forward. Additional criteria became operational, with a number of revisions to the SGP, such as through the Six Pack (2011), the Two Pack (2013) and the TSCG in the Economic and Monetary Union (EMU) (2013).

The “Six Pack”<sup>31</sup> strengthened fiscal surveillance, reforming both the preventive and corrective arms of the SGP. It established the macroeconomic imbalance procedure (MIP), aimed at identifying, preventing and addressing macroeconomic imbalances that could adversely affect the EU’s economic stability. To reinforce the preventive arm of the SGP, the Six-Pack reform introduced an additional indicator for assessing the progress toward the MTO, the so-called expenditure benchmark (EB). While there are several variations of the expenditure rule, the general principle is that net government spending should remain at or below the growth in potential output. Spending increases in excess of potential output growth need to be matched by revenue-raising measures. The EB differs from the structural balance, as it considers potential output growth, whereas the structural deficit is based on the OG. Importantly, the time horizon over which potential output is considered is ten years, so it is considered to be less procyclical than a structural-balance rule. The idea was to replace the structural-balance rule, but member states ultimately decided to use both. Member states are, therefore, required to converge towards their MTO, in terms of both the new EB and structural balance.

On the corrective arm side, the Six Pack operationalised the Treaty’s debt criterion of a “sufficiently diminishing” debt level through the excessive deficit procedure. Member states with debt ratios in excess of 60% of GDP are required to reduce debt by 1/20th of the gap between the current level of debt to GDP ratio and the 60% reference annually, averaged over a three-year period. Member states

can depart from the adjustment path in periods of severe stress, provided it does not threaten fiscal sustainability.

Alongside the negotiation of the Two Pack, which strengthened monitoring and surveillance, the TSCG entered into force in 2013. It committed countries to integrate the EU budgetary framework into their national law. The TSCG included a balanced budget rule, which limits the structural deficit to 0.5% of GDP or 1% if the debt to GDP ratio is below 60%. It contained the 1/20th rule, introduced in the Six-Pack regulations, and introduced an automatic correction mechanism, which applies in case the structural deficit limit is breached significantly.

Further revisions to the SGP were made in 2015, when the Commission responded to the claim of excessive rigidity of fiscal adjustment requirements. The reform aimed to make fiscal rules less procyclical and better tailored to member states’ specific circumstances. The previous requirement of annual adjustment of the structural balance of 0.5% of GDP was replaced by the introduction of a range of adjustment efforts (the so-called “matrix of requirements”), ranging from 0 to 1% of GDP, depending on the cyclical conditions of the individual country, the debt level and the sustainability of the public finances.

Since 2015, the fiscal rules have contained some scope for flexibility in accounting for public investment. In particular, temporary deviations from the MTO are allowed under the so-called “investment clause”, provided a number of conditions are met. This includes a negative OG or negative output growth, and that the deviation does not lead to a headline deficit in excess of 3%. Moreover, the investments need to be co-funded by the EU and need to demonstrate positive public finance and growth effects. The member state will compensate for any temporary deviation from the MTO, which is reached within four years.<sup>3233</sup>

Apart from the procyclical tendencies embedded in the structural balance discussed above, some further comment is warranted on reforms in recent years.

The debt-reduction rule, if applied today, would require extraordinary and unrealistic levels of austerity in some countries. Italy, with a debt level of around 150%, would require an annual debt reduction of 4.5 percentage points, on average.<sup>34</sup> In regards to the MIP, the procedure entails a very large list of variables, reflecting, at least in part, the political-economic interests of major exporting member states, such as Germany, than it does economic evidence. For instance, a current account deficit of -4% is considered excessively low, but it is only when it is above +6% that it is considered excessively high. There is also ambiguity as to the relationship between the MIP and the fiscal rules. The processes of fiscal and macroeconomic monitoring are separate, but recommendations for one can clearly affect the other.<sup>35</sup>

A similar point can be made with regard monetary policy. Greek bonds were largely excluded from pre-Covid-19 rounds of quantitative easing, which contributed to the enormous fiscal pressure it experienced through the crisis years. ECB purchases were, at that stage, based on member states' capital keys, broadly in line with GDP. In July 2022, the ECB introduced the "transmission protection instrument", enabling country-specific purchases. While not necessarily bad, the process appears to lack transparency and could have very large fiscal implications.

## 2.4 Recent reform directions

On 9 November 2022, the Commission published a communication on reform of the EU economic governance framework.<sup>36</sup> It set out a number of general or high-level proposals to reform the fiscal rules in lieu of further proposed reforms in 2023. The document acknowledges the need for reform in light of Covid-19 fiscal supports, the challenges of the green and digital transition, the limitations of basing rules on unobservable indicators subject to frequent revisions, and more.

The main thrust is that member states would negotiate country-specific debt-reduction plans

with the Commission. For member states where debt is deemed to be high or medium risk, debt is to converge towards 60% over the course of a decade, with the 3% deficit rule also remaining in place. The procedure would be as follows: the Commission conducts an analysis and puts forward a "reference adjustment path", which constitutes the initial position. Member states then respond by proposing medium-term fiscal adjustment plans. These set out country-specific fiscal trajectories and public investment and reform commitments, not least in the area of climate change. This is then discussed and negotiated with the Commission, and later by the Council. Once accepted, annual member-state budgets then commit to implementing the planned fiscal trajectory over four years to ensure the ten-year debt trajectory is sustainable. Member states can request adjustment periods longer than four years – a further three years – if underpinned by structural reforms and certain investments.

The initial reference adjustment path is informed by the Commission's debt sustainability analysis, which, the Commission emphasises, is not part of the implementation process. The principal indicator around which implementation of the adjustment plan is assessed is a net primary-expenditure rule (expenditure net of interest, cyclical welfare spending and one-off revenues). Enforcement will be achieved through annual assessments of the plan, through the EDP, and other mechanisms. Financial sanctions in the case of non-compliance are to be made "smarter", including in cases of non-compliance with investment commitments. The document recognises that high-debt member states cannot uphold the 1/20th debt-reduction rule. It also makes repeated reference to maintaining the deficit below 3% over the medium term, implying temporary deviations would be permitted, if later corrected.

The text is broad and somewhat vague, but a number of the reforms are obviously welcome. The abolition of the 1/20th debt-reduction rule is particularly so. That the main implementation indicator is to be net expenditure, as opposed to an unobservable and unmeasurable structural deficit, is also a positive move. Country-specific adjustment paths, tailored to the needs of the country, are also an improvement

on one size fits all measures. Finally, allowances for green and other types of investment are very much needed.

Despite its improvements, the core principles of the SGP remain in place. Most importantly, the core limits of 60% debt to GDP ratio and 3% deficit are unchanged. Arbitrary as these limits were to begin with, as we elaborate in Section 4, the world is a much-changed place over three decades later, so they make even less sense today. In terms of the medium-term adjustment plans, there is a trade-off between tailored, and hence, context-appropriate, fiscal policy on one hand, and vesting non-transparent and potentially unaccountable power in the Commission on the other. The reform process raises yet further concerns about democratic legitimacy on the part of the EU. Similarly, climate investment is poorly defined, and the criterion that reforms be “growth enhancing” leaves open the possibility of rolling back welfare entitlements, such as raising retirement ages.

On a more technical note, much will hinge on the initial reference adjustment path and the debt-sustainability analysis underpinning it. The reformed rules will be a variant of the EU’s existing debt-sustainability analysis framework, which is used to estimate the development of the debt to GDP ratio based on primary spending, interest rates, economic growth and inflation. Growth is based on Commission projections and inflation is assumed to converge to 2%, the ECB target. The primary balance includes estimates of age-related spending based on demographic projections and includes estimates of the structural primary balance. This, as we have discussed, suffers from severe measurement problems. Moreover, if later iterations for the reform propose that net primary expenditure be based upon the potential output growth, this too could be problematic, given the measurement difficulties already discussed.

Van Dijk et al. note that the estimate of interest expenditure depends heavily on assumptions about future interest rates.<sup>37</sup> Future interest spending is, in turn, based on projections of the risk-free rate, term premia and the spread over the risk-free rate.

For these, the EU uses market expectations for the coming ten years, therefore, avoiding direct assumptions about EU-institution behaviour and monetary policy. However, market expectations embed beliefs about ECB behaviour. Similarly, if the EU deems debt to be sustainable, then this can feed back into market beliefs. In other words, the behaviour of EU institutions, and not merely the underlying economic dynamics, can influence the sustainability of member states’ debt. Finally, small tweaks to interest or growth assumptions can generate large swings in the estimated trajectory of the debt to GDP ratio.<sup>38</sup> The initial sustainability analysis, which sets the tone for subsequent negotiation, is subject to considerable uncertainty.

In summary, the European fiscal framework has become increasingly complex. According to the SGP, government deficits should not exceed the ceiling of 3% and debt should not exceed 60% of GDP ratios. If debt is higher than the 60% threshold, the debt-reduction rule requires countries to reduce the difference by, on average, 1/20th annually. Member states are deemed compliant with the SGP when certain requirements are met. Member states are required to reach a *country-specific* MTO. Originally, the structural deficit was not to exceed 0.5% (or 1% if the debt ratio is below 60%), but this was subsequently refined with a range of adjustments, depending on the state of public finances. The net EB means that countries’ expenditures should not exceed potential output growth. Deviations from the MTO are allowed for public investment and structural reforms, under certain restrictive conditions. Through the different revisions, the rather simple regulatory framework of the SGP increasingly became more complex, sophisticated and less transparent. More details were added to the rules, as well as more exceptions designed, giving greater discretion to European institutions. The communication in late 2022 builds on this by indicating it will provide greater sensitivity to member states’ national contexts and investment needs.

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# **3. PUBLIC INVESTMENT NEEDS AND CHALLENGES**

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# 3. PUBLIC INVESTMENT NEEDS AND CHALLENGES

This section looks at trends in investment in the context of the EU fiscal rules. It looks at the role public investment has played historically and surveys some of the areas in which the EU has greatest investment need. It finds that high-income EU countries have benefitted from very high levels of public investment historically, and that the poor regions of Europe have, unsurprisingly, the greatest investment needs. Any reform of the fiscal rules should be sensitive to these facts.

## 3.1 The golden era of public investment

Public investment is typically measured as public spending on gross fixed capital formation (GFCF). This is defined as spending that results in the acquisition of fixed assets intended to be used for the production and provision of goods and services. Fixed assets include buildings, infrastructure, machinery and equipment. Residential buildings for public housing are included, as these are used to provide housing services. It excludes categories of public spending that might be deemed by some to be an investment, but which do not result in the acquisition of a fixed asset. This includes spending on education, R&D and intangible assets. Public GFCF also excludes investment by public companies, and there is ambiguity as to whether public-private partnerships are included. It is therefore an imperfect measure of investment, as conventionally understood by the term.

Figure 1 looks at trends in public investment in some of the EU's wealthiest member states; those located in western and northern Europe. It also looks at the EU's less-well-off areas of southern, central and eastern Europe. Most of the data are taken from the EU's AMECO database and supplemented with data from the IMF, especially for data for the 1960s. The decline in public investment is most pronounced in

western Europe. France, Germany, the Netherlands and Austria all experienced large declines in investment as a share of GDP since the series began in 1960, though the decline really began in the 1970s. Belgium has shown a large fall since the 1970s as well, though not throughout the whole series.

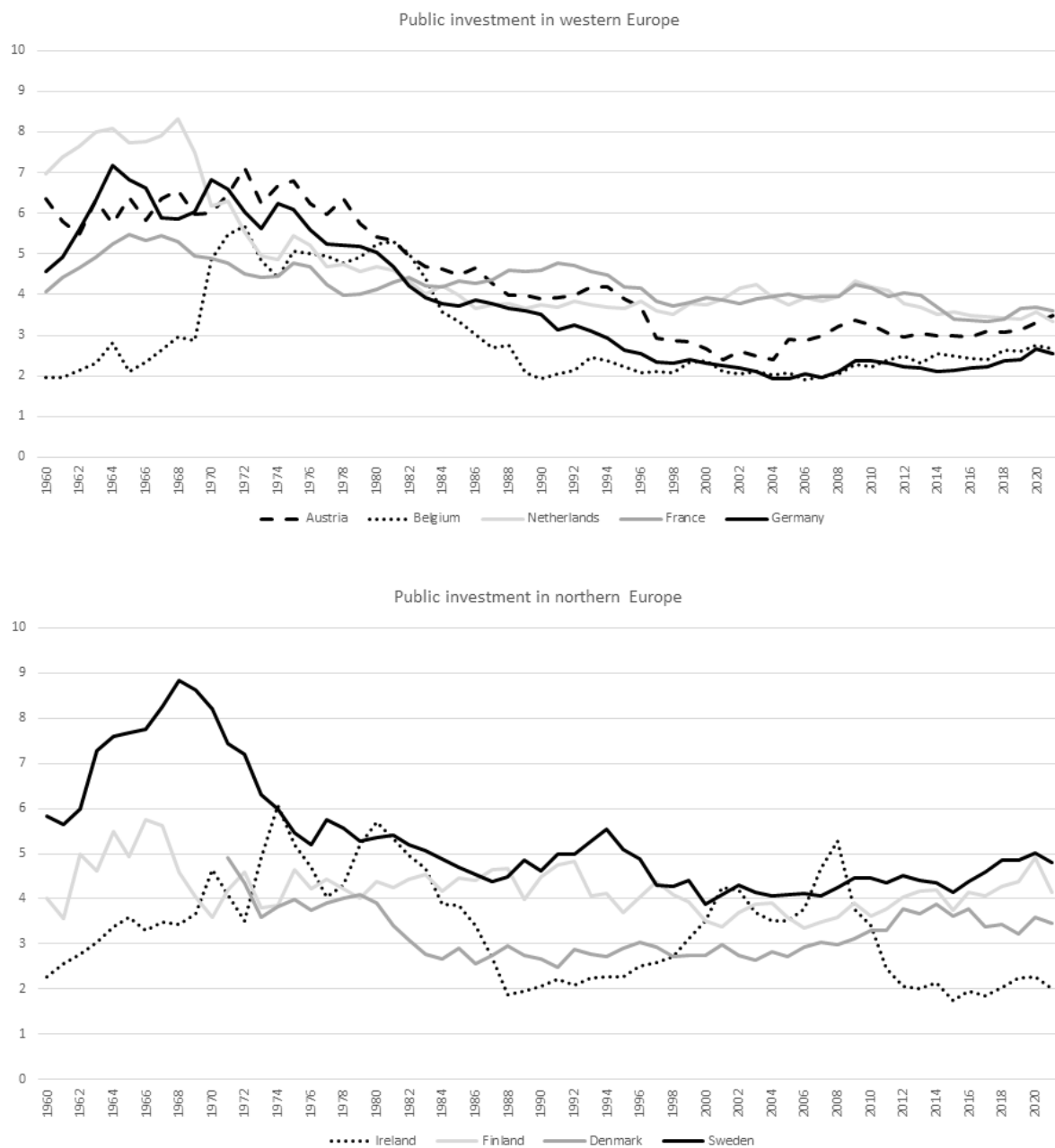
It should be noted that declining public investment does not necessarily mean underinvestment. The need for public investment may fall as living standards rise and as the required infrastructure has been put in place.<sup>3940</sup> For instance, Hellwig and Neuman attribute the decline in public investment in Germany from the 1970s to the completion of the post-war reconstruction.<sup>41</sup> The road network and housing stock had been rebuilt, while demographic developments reduced the need for new public housing. Similar forces are likely to have been in operation in other western European countries.<sup>42</sup> This is not to say that Germany, or other countries for that matter, does not suffer from public investment and infrastructure deficits,<sup>43</sup> a point we elaborate on later.

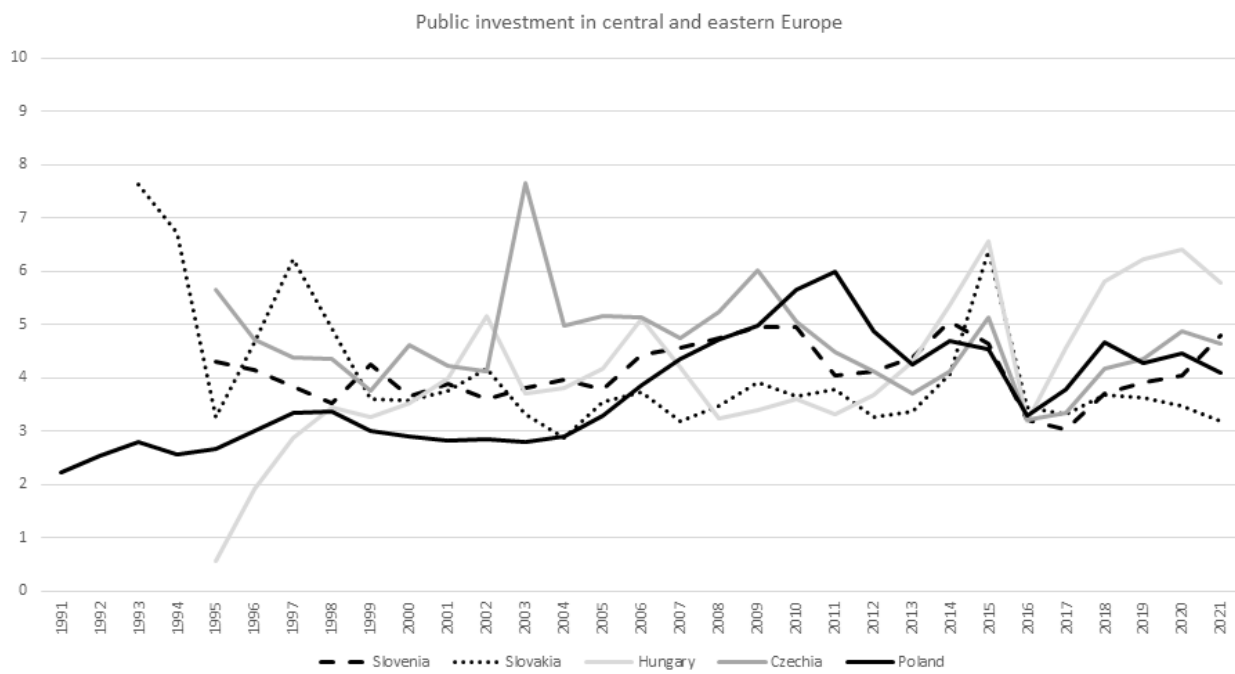
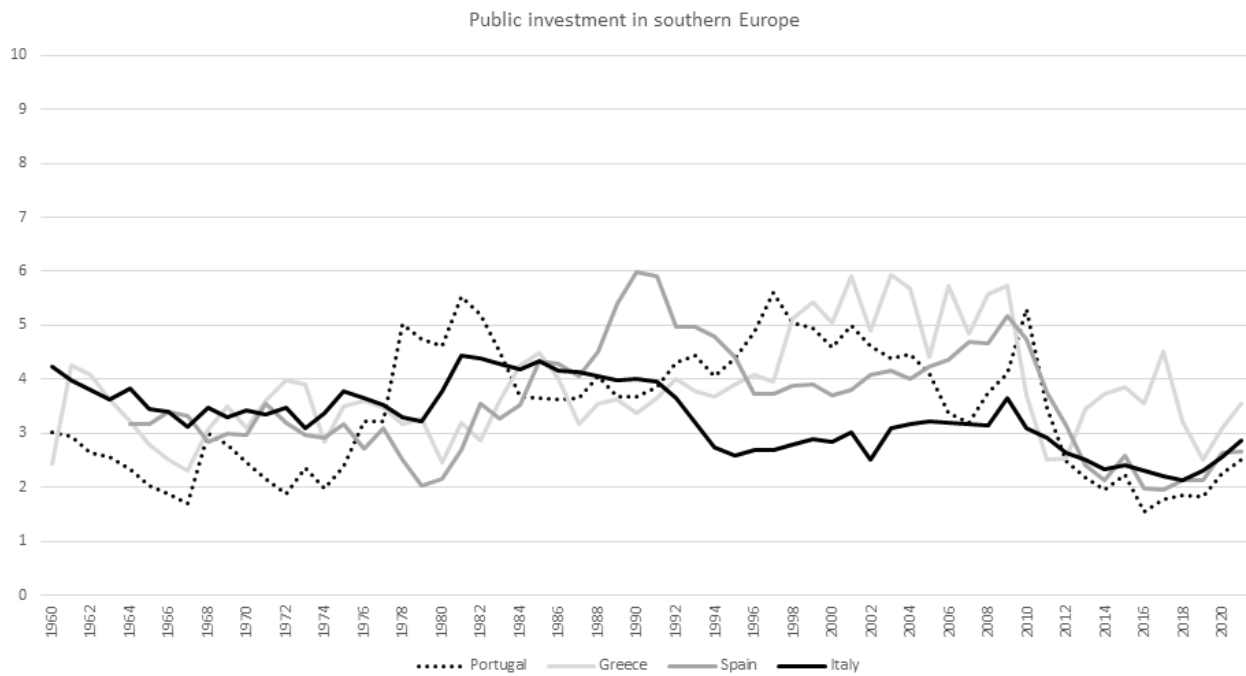
The picture is similar but somewhat more stable in northern Europe. Investment increased in the 1960s, and then declined in the 1970s. Over the entire series, Sweden and Denmark show a decline, whereas Finland and Ireland show variation, but without a clear trend. The decline in Sweden may, as in other countries, be related to a satiation of public investment need and opportunities, at least partly. Much of the decline was investment in roads and telecommunications,<sup>44</sup> while the post-war period witnessed rapid urbanisation, after which there was less need for investments in areas like housing.<sup>45</sup> The unravelling of the quasi-planned social democratic economic model on one hand,<sup>4647</sup> and the housing bubble crashes in the early 1990s on the other, also played a role in the three Nordic countries. In Ireland, public investment appears to be strongly driven by the business cycle.<sup>4849</sup>

Turning to southern Europe, we see declines in public investment in the two largest countries, Italy and Spain. Public investment in Italy post-war was associated with curbing large regional imbalances through infrastructure and other projects.<sup>5051</sup> In Spain, state-directed public investment formed part of industrial policy under Franco, and in the 1980s investment increased as a result of devolution, structural funds-assisted infrastructure spending

and “reconversion programs” supporting domestic industry.<sup>525354</sup> Both countries expanded investment in the 1980s, after which there was a significant decline during the 1990s. This is also true of Portugal, though public investment fell somewhat earlier. Greece is more volatile. The most striking feature in recent years is that public investment is still yet to fully recover from the financial crisis, although it is on an upward trajectory.

**Figure 1. Public investment in the EU (% GDP).**





Sources: AMECO and IMF Investment and Capital Stock Database.





*Due to age-related pension and health spending, public expenditure has increased across the developed world and the EU. So, while public investment has fallen, it is not the case that government spending has fallen generally.*



Moving eastwards, the series goes back only to the 1990s. Needless to say, the state had previously dominated all forms of investment, though infrastructure remained underdeveloped compared to older member states. Aside from Hungary, which has seen a steady increase in investment, the picture is one of fluctuation but relatively little trend towards an increase or decrease. Access to the EU resulted in an increase in many countries, especially in Poland, which used EU funds to upgrade its transportation infrastructure.<sup>55</sup> There were sharp contractions after the financial crisis, from which there were comparatively quick recoveries.

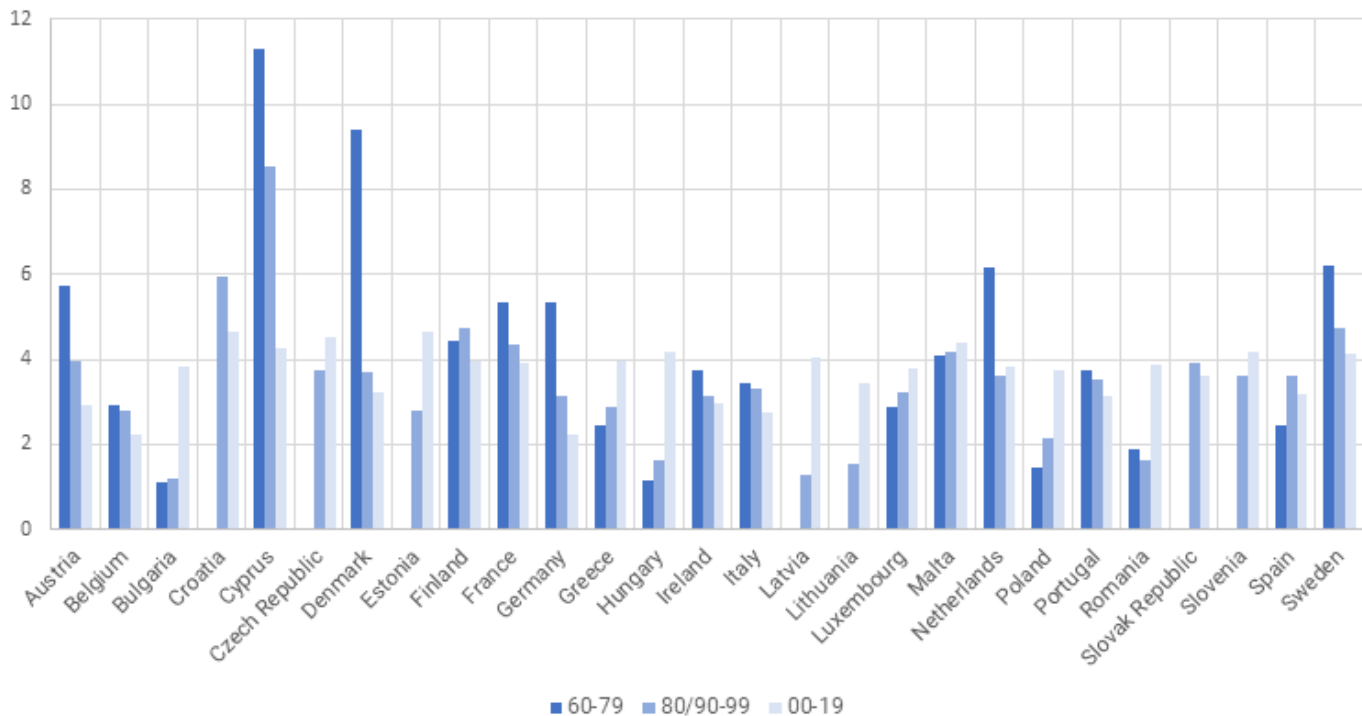
An important consideration in public investment trends is the growing competition for public resources over the last number of decades. Due to age-related pension and health spending, public expenditure has increased across the developed world and the EU. So, while public investment has fallen, it is not the case that government spending has fallen generally. Delgado-Télez et al. argue that this has been a major factor in the decline in public investment, along with fiscal consolidation, saturation of investment opportunities and more.<sup>56</sup> The picture that emerges, then, is that the “golden era” of high public investment should be viewed in light of the economic circumstances of those times. Ultimately, there was a high need and demand for investment driven by many factors, including a young but growing population, suburbanisation, post-war reconstruction and recovery, and a consequent building up of the capital stock.

### 3.2 Price effects and public investment

The previous section outlined the decline in public investment across most of Europe over the last number of decades due to a variety of factors. Another reason why investment may decline is that the price of investment goods may decline faster than other goods. An entity, public or private, may appear to be spending less on investment relative to their total spending but only because the price of the former has fallen relative to the latter. Computers are an example of goods whose price has fallen enormously over the last number of decades. A firm that invests only in computers would appear to be investing less and less, but would not necessarily be underinvesting.

Figure 2 looks at changes in public investment to GDP holding prices constant, so that if the price of investment goods falls relative to economy-wide prices, this does not show up as a fall in investment relative to GDP. Any change is, therefore, a result in the amount or volume of investment goods produced relative to the volume or total output in the economy. It shows average investment over three 20-year periods.

**Figure 2. Real public investment to GDP ratio.**



**Source:** IMF investment and capital stock database.

**Notes:** Data for central and eastern countries are generally not available before 1990. The base year for prices is 2017.

Figure 2 shows that the fall in investment is less dramatic in these terms. Several countries, especially western and northern European countries, still witness a significant drop in the public investment share of GDP. Still, the decline in investment in real terms is less dramatic, indicating that price effects have played an important role in the diminishing importance of public investment spending. Around half of the countries actually experience an increase in public investment, albeit the increases in investment are generally minor. Moreover, in many of the countries that have witnessed real declines in public investment, the private sector has taken up the slack - the decline in total investment is less pronounced.<sup>57</sup>

A further point worth considering is that our analysis has focused on GFCF. Another commonly used measure is net capital formation, which is gross capital formation minus depreciation of the capital

stock. By subtracting wear and tear from gross investment, one arrives at a figure for the net addition to the capital stock. One problem with this series is that it is erratic, whereby year-on-year changes appear to be driven by highly variable depreciation charges. These, in turn, are influenced by compositional changes in investment, such as a move toward investment in equipment, which depreciates quickly, and a move away from investment in structures, which depreciate slowly. As equipment investment has grown relative to investment in structures, so has the size of the depreciation charges.<sup>58</sup> In any event, we believe that the wide year-on-year swings render the measure a less meaningful indicator of underlying economic dynamics. Moreover, data on net capital formation is patchier and gross capital formation is a more relevant measure of investment when considering the budgetary impact. For these reasons, we rely on gross capital formation.

### 3.3 Europe's investment needs

There are a number of ways to gauge a country's public investment needs. One is to simply tot up the stock of public capital and compare that stock to the measured stock in similar countries. In that way, the total stock of capital is measured, without reference to its quality. However, as already discussed the stock of capital, whether public or private, is poorly measured. The Appendix presents some data on the aggregate capital stock.

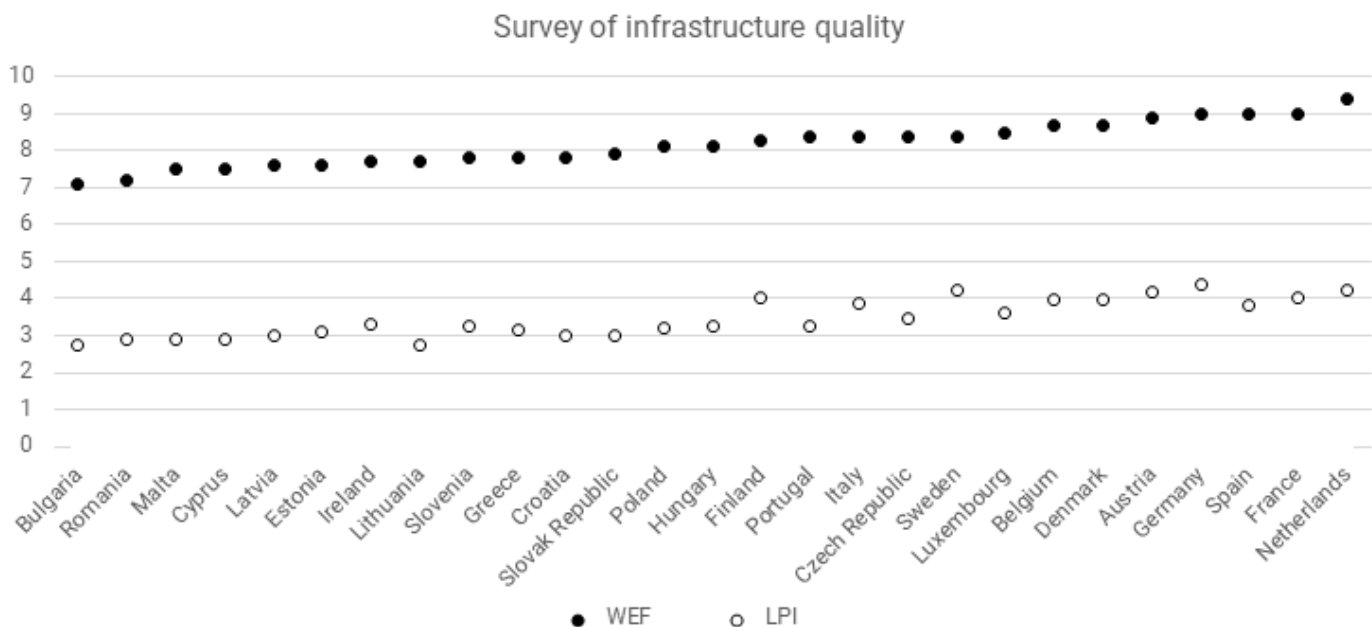
We instead rely on survey evidence. Figure 3 contains the views of business executives and professionals from two global surveys. The first is from the World Economic Forum (WEF), collected as part of the global competitiveness report. Within the survey, the quality of infrastructure is scored between zero and 100, which we have scaled to ten. It surveys the quality of utility and transport infrastructure, and most of the variation comes from transport. The second survey contains results from the logistics

performance index (LPI). This surveys professionals involved in international trade, whereby they rate the quality of trade and transport-related infrastructure on a scale of one to five. The countries are aligned from left to right according to their perceived infrastructural quality, according to the WEF survey.

The two surveys align with each other. Countries that do well on one, generally do well on the other, and similarly for countries that do poorly. Some exceptions include Finland and Sweden, which do better on the LPI than the WEF survey, and Lithuania, which does especially poorly on the LPI but less so with the WEF. The consistency between the two adds to the credibility of each.

We see that the EU's poorest countries tend to have, unsurprisingly, the lowest-quality infrastructure. For instance, Romania and Bulgaria have the lowest-quality infrastructure, according to the WEF survey, and, along with Malta, score poorest in the LPI survey. The EU's poor regions, therefore, have the greatest investment needs.

Figure 3. Real public investment to GDP ratio.



Sources: WEF and World Bank.

Note: LPI refers to the logistics performance index which measures the quality of trade and the transport-related infrastructure on a scale one to five. WEF refers to a World Economic Forum's survey on the quality of infrastructure, scored between zero and 100, as part of the global competitiveness report.

Western and northern European countries are perceived to have the best quality of infrastructure. This includes Germany, despite its low levels of investment in recent years. This points to the importance of the quality and efficiency of public investment, not just the quantity. Similarly, Greece experienced a significant expansion in public investment in the early 2000s before hosting the Olympics, with seemingly little, if any, long-term economic benefit. It ranks slightly below the middle in both the WEF and LPI measures of infrastructure quality.

### 3.4 Green investment needs

In December 2019, the EU unveiled the European Green Deal (EGD), an ambitious plan to tackle climate change. It sets out to cut greenhouse gas emissions by 55% by 2030 relative to their 1990 level, and ultimately realising net-zero emissions by 2050. A variety of investments are required to make the transition. This includes moving toward more sustainable modes of agriculture, retrofitting of the building stock, development of renewable energy generation, and carbon taxation.

Despite its ambition, it has been subject to much criticism. This includes the adequacy of the targets, the feasibility of meeting the targets that have been set, the lack of new funds being released, the lack of support and compensation given to adversely affected workers, and the lack of new policy tools.<sup>596061</sup>

For the purposes of this policy study, there appears to be considerable uncertainty about how the EGD is to be financed. It is unclear how much of it will come from public investment and the required breakdown of public investment between the EU-level spending and national spending needed. The EGD investment plan originally pledged €1 trillion over ten years, both public and private investment. Other EU documents have since put the required investment significantly higher.<sup>62636465</sup> Of the €1 trillion over a decade, around half of the money is to come from the EU budget,

with the remainder coming from a mix of national governments and private investment.

The uncertainties around the total cost, in turn, create uncertainties around the required increase in public investment. Darvas and Wolff estimate a required increase in public investment of between 0.5% and 1% of GDP,<sup>66</sup> while Pollin suggests the required increase in public investment for the EU could be around 0.6% of GDP.<sup>67</sup> Underlying the degree of uncertainty, recent estimates put the required increase in public investment at 1.7%<sup>68</sup> or 1.8% of GDP.<sup>69</sup>

Green investment requirements will obviously differ according to country. If one looks at greenhouse gas emissions per capita, it is the EU's high-income countries that appear to have the most work to do. Of the EU's ten largest emitters, only three are new member states from the east. However, this is largely driven by lower living standards among new member states, rather than by their more environmentally friendly economies. Romania, for instance, appears to be the fourth cleanest country in the EU, but it is also one of the poorest. On the other hand, Poland, a large coal producer, faces major challenges, as it is both a high emitter and has living standards that are considerably below the EU average.<sup>70</sup>

Baccianti compares the necessary green public spending needs across member states from 2021 to 2027 and how well EU funding streams meet those needs.<sup>71</sup> This includes the Recovery and Resilience Facility (RRF) and other facilities, such as the EU Modernisation Fund. Consistent with the discussion above, it is the EU's poorest countries that have the largest spending and investment needs. All of the neediest countries are indeed new member states and southern European countries. Bulgaria, Poland, Estonia and then Greece have the largest spending needs (~3-4% of GDP). While in some countries EU funding makes a major contribution in meeting those needs, in many countries significant gaps remain (~1-1.5% of GDP).

At the local level, the European Investment Bank surveys municipalities across the EU on gaps in investment and their investment plans over the

coming period. Responsible for around half of total public investment, on average, the survey provides a gauge of the state of investment facing public authorities, including green investment. Between 2017 and 2019, southern European municipalities were most likely to policy-study investment gaps, followed by central and eastern European municipalities, with western and northern European municipalities the least likely.<sup>72</sup> Climate-change adaptation and mitigation were the two areas with greatest investment needs in all of the regions, particularly investment in electric charging stations and, to a lesser extent, regional transport infrastructure.

Despite reporting the greatest need, southern European municipalities were least likely to report planned green investment over the next five years. Lack of funds and regulatory concerns are the major investment barriers, with lack of funds being somewhat more important in the south and relatively less important in western and northern Europe.<sup>73</sup>

A number of EU funding mechanisms are available to member states to meet their green investment needs. As mentioned, one innovation is the Next-Generation EU RRF, introduced since Covid-19. It provides up to €312.5 billion in grants and up to €360 billion in loans to finance member states' recoveries (both in 2018 prices), with member states also providing matched funding. Based on the allocation mechanism, poorer countries tend to receive more in grant funding.<sup>74</sup> A condition is that 37% of total funding be allocated to "green transition", but many countries have allocated a higher share.<sup>75</sup> However, it seems that a large part of the funding has financed investments that were already planned, rather than new projects.<sup>76</sup>

Darvas and Wolff simulate the required after-tax spending changes the EU would need to undertake in the coming years.<sup>77</sup> Given the current make-up of the fiscal rules, and with some flexibility in implementation, compliance implies consolidation, or austerity, of 0.3%, 0.4% and 0.5% of GDP in 2023, 2024 and 2025, respectively. If we take the lower estimate of the required increase in green public investment of 0.5%, this would imply either tax increases or spending reductions of up to 1% of GDP each year. This would rise to tax increases or spending reductions of 2% per year, if the required increase in public investment turns out to be 1.5% of GDP. As spending pressures in the coming years are likely to grow and not fall, due to societal ageing, most of the finance would have to come from tax increases. Tax increases to the tune of 1% of GDP for three consecutive years (at least) are implausible, never mind increases of 2%.

In summary, Europe's high-income countries from the north and west of Europe relied heavily on public investment, particularly as they rebuilt their economies following the Second World War. Public investment as a share of GDP has since fallen, but, in volume, constant-price-term investment has fallen much less, or not at all. High-income countries have the highest-quality infrastructure and appear to have less work to do to meet the challenges of climate change. Southern European countries have relied less on public investment, particularly since the introduction of fiscal rules. Central and eastern countries continue to invest heavily, albeit their investment today does not match that of Europe's high-income countries historically. Like the south, the east has major climate challenges.



*Europe's high-income countries from the north and west of Europe relied heavily on public investment, particularly as they rebuilt their economies following the Second World War. Public investment as a share of GDP has since fallen, but, in volume, constant-price-term investment has fallen much less, or not at all.*



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# **4. PUBLIC FINANCE SUSTAINABILITY**

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## 4. PUBLIC FINANCE SUSTAINABILITY

This section looks at various issues surrounding public finance sustainability. It argues that the emphasis given to debt and deficits in the current fiscal rules is unwarranted, particularly given the structural fall in interest rates. It then looks at the debt-servicing burden and compares it to the traditional debt and deficit metrics. It finds that debt and deficit perform no better for debt servicing at predicting financial stress and, if anything, are inferior.

### 4.1 Debt accumulation – should we care?

The current make-up of the fiscal rules puts great emphasis on the level of debt, particularly gross debt. The level of (gross) debt is not only a key benchmark in and of itself, but it is also a key anchor for other metrics in the fiscal rule set. The speed of debt reduction depends on how far a country is from the 60% benchmark, and the allowable structural deficit also depends on whether a country is above or below the threshold. The debt level is a key consideration in allowing a potential relaxation of the rule set, such as through the investment rule. It is, therefore,

of utmost importance that debt benchmarks are grounded in sound economic principles.

The level of debt is, however, a poor guide to public financial sustainability. It says little about how onerous it is to repay the debt.<sup>78</sup> When the principal payment on a debt comes due, governments typically do not draw down or use their cash balances to repay the obligation. More commonly, they “roll over” the debt, issuing new debt to repay the old. Similarly, this new debt is likely to be rolled over in the future, and so on. It is, therefore, not so much the level of debt or size of the deficit per se that imposes an economic cost, but the burden of servicing that debt. This is more the case with public debt than private, especially individual debt. Governments, unlike people, effectively live forever, so can continuously rollover payments.

The level of debt is a particularly poor guide to public financial sustainability in an era of low interest rates. As interest rates have fallen over the last number of decades, countries have been able to run deficits and sustain higher and higher levels of public debt. Historically, countries that sustained high levels of debt were likely to run afoul of financial markets, but that is much less so today.

“

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This can be seen in Figure 4. It shows the evolution of the debt to GDP ratio and interest payments relative to GDP in a selection of Europe's economies. Interest payments relative to GDP proxies the burden of servicing debt, but it excludes interest payments received by states. These can arise through state investment in financial assets, including through central bank holdings of government bonds and other financial instruments. Moreover, inflation can erode the value of debt and the payments to service it. Nominal interest payments relative to GDP may, therefore, understate how onerous it is to service borrowing, as it looks only at gross not net borrowing, while also excluding the impact of inflation.

Nevertheless, it shows that the relationship between debt and the (approximate) cost of servicing has broken down. This is well illustrated in Germany, where data stretch back furthest. From the early 1970s until the late 1990s, increases in debt correlated well with debt-servicing costs. After that, Germany continued to accumulate debt, but the burden of servicing it actually fell. Germany's debt is currently historically high, but the cost of servicing it is exceptionally low. Italy displays a similar pattern, although the cost of servicing debt remains elevated, as it started from a higher base.

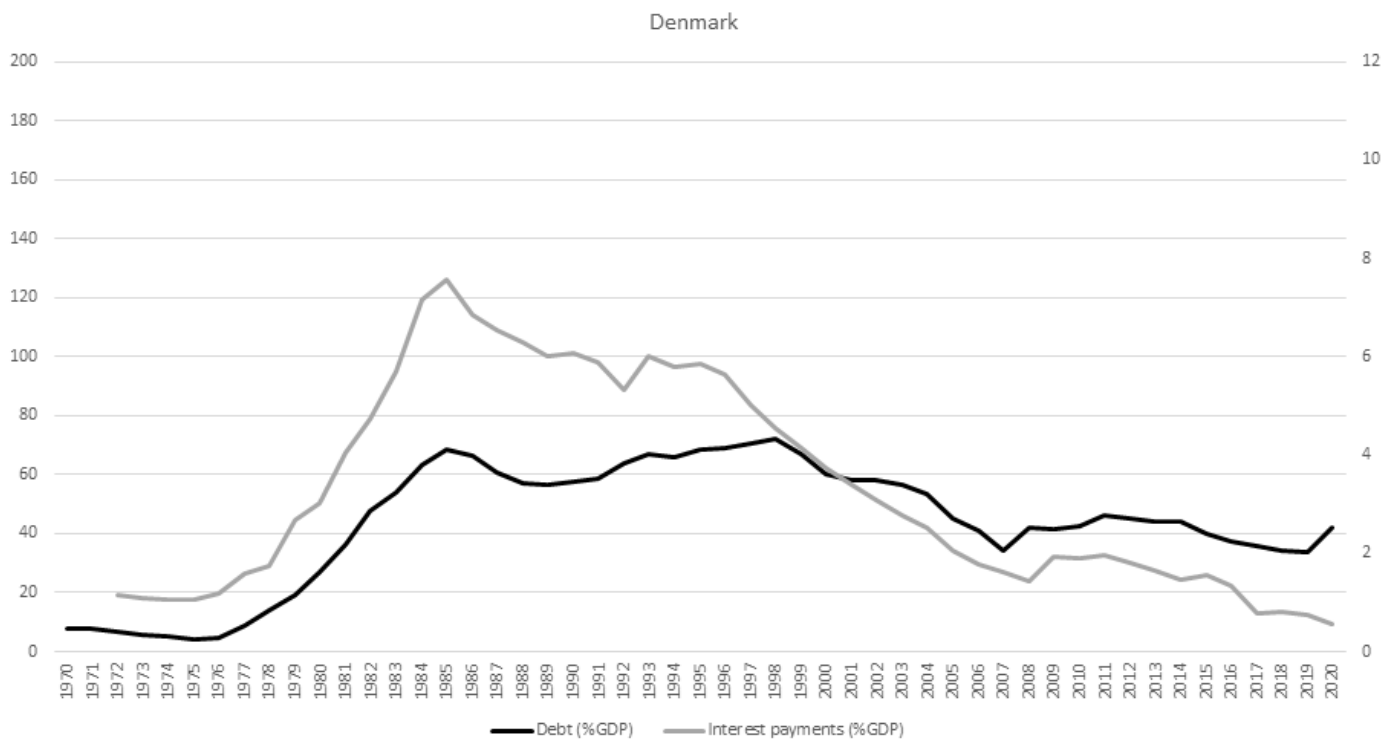
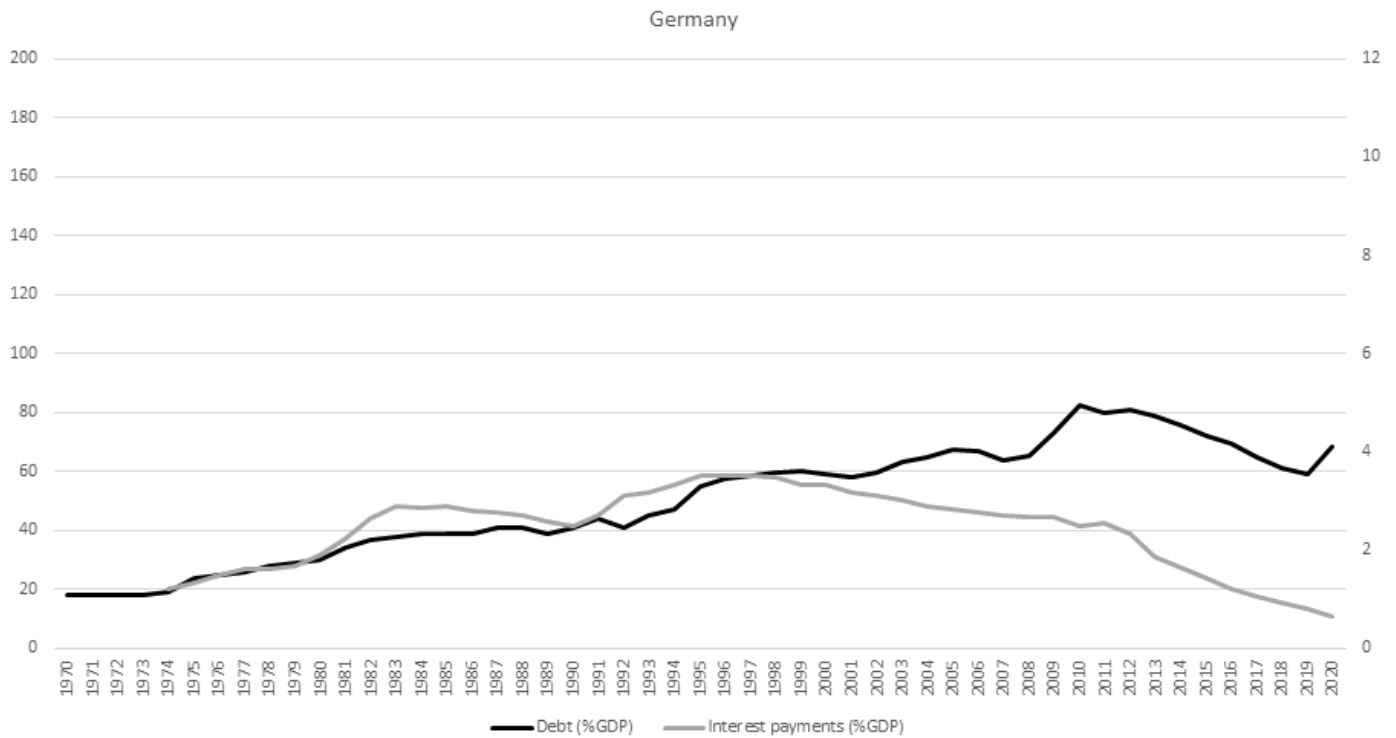
This trend of falling debt-servicing costs is not restricted to eurozone or high-income countries, as illustrated by Denmark and Romania. In Denmark, the relationship between debt and servicing costs breaks down sooner than in Germany and Italy – the early as opposed to late 1990s. Fewer data are available for the case of Romania, and it has had low levels of indebtedness in its recent history. A clear pattern of divergence between the two series is only evident in the last decade. The point remains, though, that the debt level is no longer a reliable measure of borrowing costs, a point which holds across a diversity of European countries.

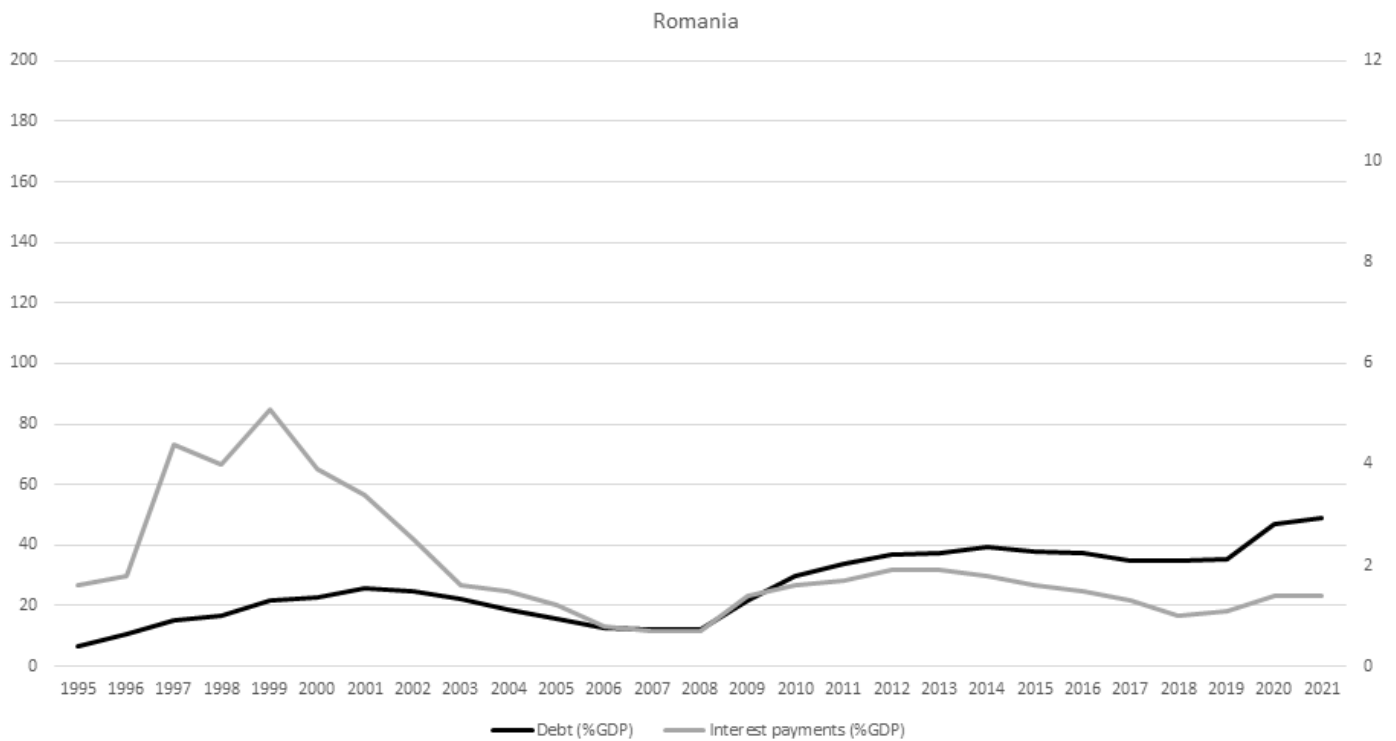
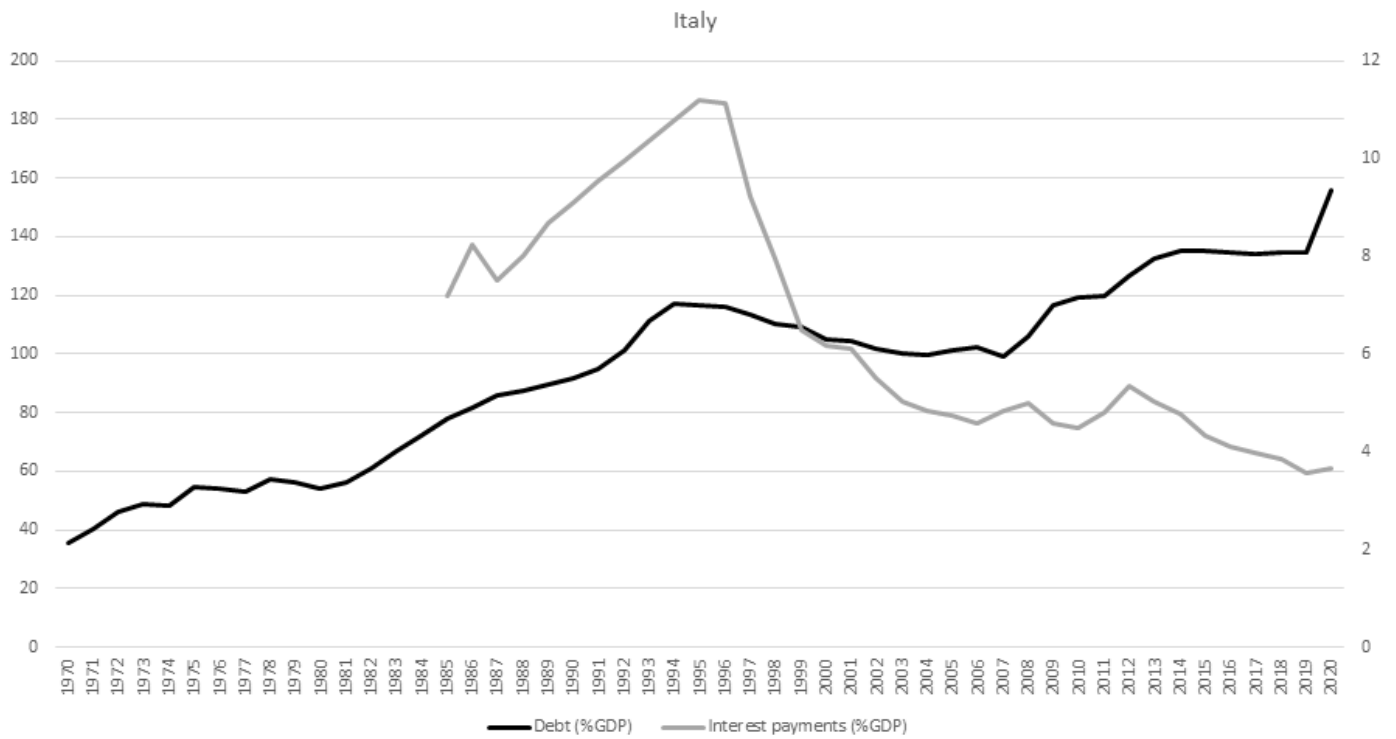
As debt is merely the accumulation of annual deficits and surpluses, or the sum of the differences between spending and revenue, the relevance of not only the level of debt is diminished under low interest rates, but also the deficit. As long as economic growth exceeds the interest rate, states are capable of

running a deficit without the need to finance it with future increases in taxation. Intuitively, we can think of a deficit incurred in a previous year as a historic debt. If an economy is growing at a sufficient rate, the historical debt becomes smaller relative to the size of the economy. Moreover, it is the interest rate on borrowing that determines the rate of growth of a historic debt in monetary terms, so if the interest rate is small compared to output growth that debt as a share of output falls over time. This is more fully explored in Box 3.



Figure 4. Debt and the debt burden in the EU.





Source: IMF Government Finance Statistics, Eurostat and Macrofinance Lab.

The reasons why interest rates have been able to fall without overheating the economy or inducing inflation are contested. The fact that inflation had not been induced by successive reductions in the policy rates suggests a shortfall of demand. An ageing, slowly growing, or even declining, population has less need for investment, in both machinery and housing.<sup>7980</sup> A similar point is true when an economy has completed urbanisation. The move toward an intangible economy may also depress the need for

fixed capital investment.<sup>81</sup> On the consumption side, older people save a greater share of their income which, similar to the decline in investment leaves a shortfall of demand.<sup>82</sup> The same is true of rising income inequality given the lower propensity to consume among the rich,<sup>838485</sup> whereas the decline in worker bargaining power means that inflation is less likely in general and when unemployment falls in particular.<sup>86</sup>

### Box 3. Debt dynamics in action

If the real level of debt is given by  $B$ , the real interest rate by  $r$  and the real primary balance or surplus by  $S$ , then:

$$B = (1 + r) B_{-1} - S \quad (6)$$

Equation (6) says that this period's debt is given by the previous period's debt times the interest rate on that debt plus new borrowing. If a country has a surplus, then the primary balance is positive, so debt falls. Rearranging to get the change in debt, we have:

$$B - B_{-1} = rB_{-1} - S \quad (7)$$

More relevant, of course, is debt relative to output, not the euro level of debt, deficit and so on. Defining the growth rate of output as  $(1+g) = Y/Y_{-1}$  and dividing both sides by  $Y$ , and with some algebra, we can get:

$$b = \frac{(1+r)}{(1+g)} b_{-1} - s \quad (8)$$

Where  $b=B/Y$ ,  $s=S/Y$ . This can be rearranged to get the fundamental equation of debt dynamics:

$$b - b_{-1} = \frac{(r-g)}{(1+g)} b_{-1} - s \quad (9)$$

This demonstrates that the change in the debt ratio depends on the primary balance and the product of  $(r-g)$  and the previous period's debt.

Stability of debt means no change in debt, so that the previous period equals the current period debt, and the term on the left side disappears. In other words, stability implies:

$$s = \frac{(r-g)}{(1+g)} b \quad (10)$$

The term in the denominator is typically close to one, and so, can be ignored. For most of modern economic history,  $r > g$ , so that the right-hand term is positive. That is to say, debt stability implies that  $s > 0$ . So, for debt not to explode, a state would have to run a primary surplus. However, as  $r-g$  has been negative for the last number of decades, debt stability need not imply running a surplus, depending on how much growth exceeds the interest rate<sup>87</sup> and on the level of the debt.<sup>88</sup> Sustained deficits of sufficient size, of course, will prove unsustainable.

On the financial side, there is a greater demand for safe assets, which pushes sovereign and other bond yields down.<sup>89,90</sup> This may be partly due to societal ageing and the growth of institutional investors, such as pension and insurance funds. In that case, lower interest rates on government and other bonds are the flipside of an investment shortfall, independent of a monetary-policy-induced fall in rates. The demand for safe assets may also be a result of financial regulation, including post-financial-crisis banking regulations.<sup>91,92</sup> Finally, a greater risk aversion among investors may lead them toward safe assets, such as sovereign debt, and away from risky assets, such as equity.<sup>93</sup>

Whatever cause or constellation of causes is identified, notwithstanding the recent high levels of global inflation, low interest rates are likely to be here for the foreseeable future. Importantly, many advanced European countries are likely to suffer from structural shortfalls of demand. This is likely to lead to high levels of unemployment and absent fiscal expansion. While public investment in constant-price terms may be steady over the last number of decades, higher deficits and higher levels of public investment are now warranted to maintain demand, independent of the need to transition toward environmentally sustainable economies.

## 4.2 Inflation, rising interest rates and public debt sustainability

The Russian invasion of Ukraine marked a return of inflation after a decade or so of price increases below central banks' targets. The ECB raised interest rates four times in 2022 alone, driven by extraordinary increases in gas and energy prices. Other central banks in Europe and across the world have pursued similar monetary tightening. With monetary tightening, government bond yields of all countries have increased, but the increase has been most pronounced in highly indebted countries, such as Italy and Greece.<sup>94</sup>

The first thing to note is that inflation is expected to be temporary. The latest forecast predicts both

price growth and, similarly, GDP deflator growth to peak in 2023 and then subside.<sup>95</sup> Similarly, ECB interest rates are expected to peak and then decline in 2023.<sup>96</sup> The growth-interest differential, even if it were to become unfavourable, would not do so for long.

Significantly, higher interest rates on new borrowing do not necessarily translate into a higher average interest rate on government debt, which is the relevant metric for sustainability. If a government locked in long-term funding when interest rates were high, the rates at which they are now refinanced may be higher than what they were, say, two years ago, but could still be lower rates than the rates at which they borrowed two decades ago. Darvas shows that the average interest rate on government debt continued to fall in both Italy and Germany during 2022.<sup>97</sup> It is expected to continue to fall in Italy up to 2027, whereas it is expected to plateau in Germany. With economic growth expected to be positive in the coming years, the continued decline in interest rates should not translate into unsustainable debt.

Darvas looks at changes in the forecasted 2026 debt to GDP ratio between April 2021 and April 2022 forecasts among 13 EU countries.<sup>98</sup> He decomposes the change into six components: interest rate changes; GDP deflator changes;<sup>99</sup> real GDP changes; tax rate changes; primary-expenditure changes; and stock-flow adjustment changes. The later forecast sees a smaller 2026 debt to GDP ratio in ten countries, compared to the previous forecast, and a higher ratio in three countries. Higher than expected interest rates tend to elevate projections of debt, but it is higher than expected primary expenditure that is forecasted to put the most pressure on debt. Nevertheless, this is somewhat offset by changes in the tax rate and real growth. However, it is higher inflation that tends to bring down debt the most, almost completely offsetting higher expected debt due to higher spending.<sup>100</sup>

In terms of the debt-servicing burden, the advantages and disadvantages of which will be explored more fully in the following section, inflation can also offset the effects of rising interest rates. This is because inflation erodes the value of the

interest payment and, importantly, erodes the value of the accumulated debt. Effectively, when inflation rises faster than interest rates, the overall burden of servicing debt, interest payment plus principle, falls

in real terms. For this reason, Furman and Summers favour the use of the real interest payments to GDP ratio in measuring the burden of servicing debt.<sup>101</sup> This is explained more fully in Box 4.

#### Box 4. Real debt-servicing burden

The inflation-adjusted rate of return, or rate of interest, is equal to the nominal rate divided by the inflation rate:

$$1 + r = \frac{1+i}{1+\pi} \quad (11)$$

Where  $r$  is the real rate of interest,  $i$  is the nominal interest rate and  $\pi$  is the inflation rate. Rearranging and multiplying, we get:

$$1 + i = 1 + \pi + r + r\pi \approx 1 + \pi + r \quad (12)$$

As  $r\pi$  is small enough to be ignored, rearranging, we get the familiar:

$$r = i - \pi \quad (13)$$

That is, the real interest rate is the difference between the nominal rate and the inflation rate. It follows that:

$$rD_{t-1} = (i - \pi)D_{t-1} = iD_{t-1} - \pi D_{t-1} \quad (14)$$

where  $D_{t-1}$  is the previous period level of debt in nominal value terms. The term on the left is the real value of servicing debt, and it is equal to the nominal payment on debt minus the part of debt that is inflated away. To understand the intuition, take two economies: both have debt levels of 100, with interest rates of 5%; and both have zero output growth. Economy 1 has 0% inflation; Economy 2 has 5% inflation. The first payment is due next year ( $t$ ) on stock of debt in  $t-1$ . The total debt burden in both economies would be 105 at  $t$ , just before the interest payment is made. However, the real value of the total burden in Economy 2 would be  $105/1.05=100$ , so the real value of total payments due has not changed, unlike in Economy 1. As Economy 1 has no inflation, the real value of the total debt burden is the same as the nominal value, 105. For Economy 2, it is as if there were no interest payment due. In other words, inflation has reduced the real value of the total payments due through a reduction in the real value of the interest payment and the real value of the stock of debt.

Furman and Summers divide across by the current year's nominal GDP to get:<sup>102</sup>

$$\frac{rD_{t-1}}{GDP_t} = \frac{(i-\pi)D_{t-1}}{GDP_t} = \frac{iD_{t-1}}{GDP_t} - \frac{\pi D_{t-1}}{GDP_t} \quad (15)$$

where  $GDP_t$  is the nominal GDP in year  $t$ . This measures the real debt-servicing burden relative to GDP. The first term on the rightmost side is the nominal interest payment, whereas the second term is the amount of debt that is inflated away.

Another metric is to instead use real GDP based on the original year.<sup>103</sup>

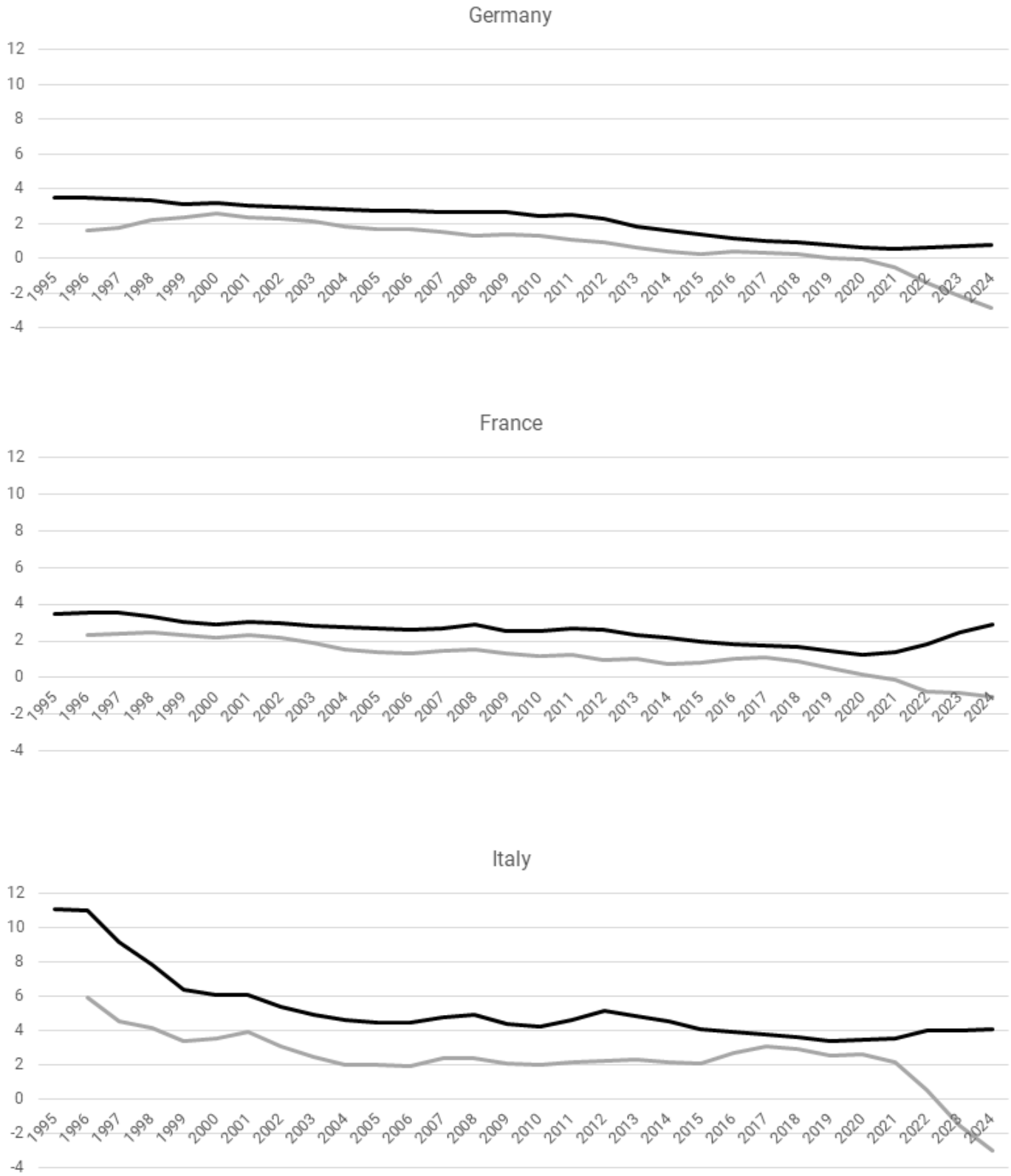
For the sake of consistency with other studies, we use nominal GDP, as per Furman and Summers.<sup>104</sup>

Figure 5 compares the nominal debt-servicing to GDP ratio with the real debt-servicing to GDP ratio, as per Equation (15). Along with France and Germany, the EU's two largest economies, we present trends for Italy and Greece, the two most indebted economies. Following Furman and Summers, we measure inflation as the rolling average change in the consumer price index for the previous five years. This has the effect of smoothing large increases, so that real debt service is understated in years in which inflation has spiked, but overstated in the years after the spike has passed. Data for 2022-2024 are based on 2022 autumn EU Commission forecasts. Nominal and real interest payments are, for reasons of data availability, presented on a gross basis.

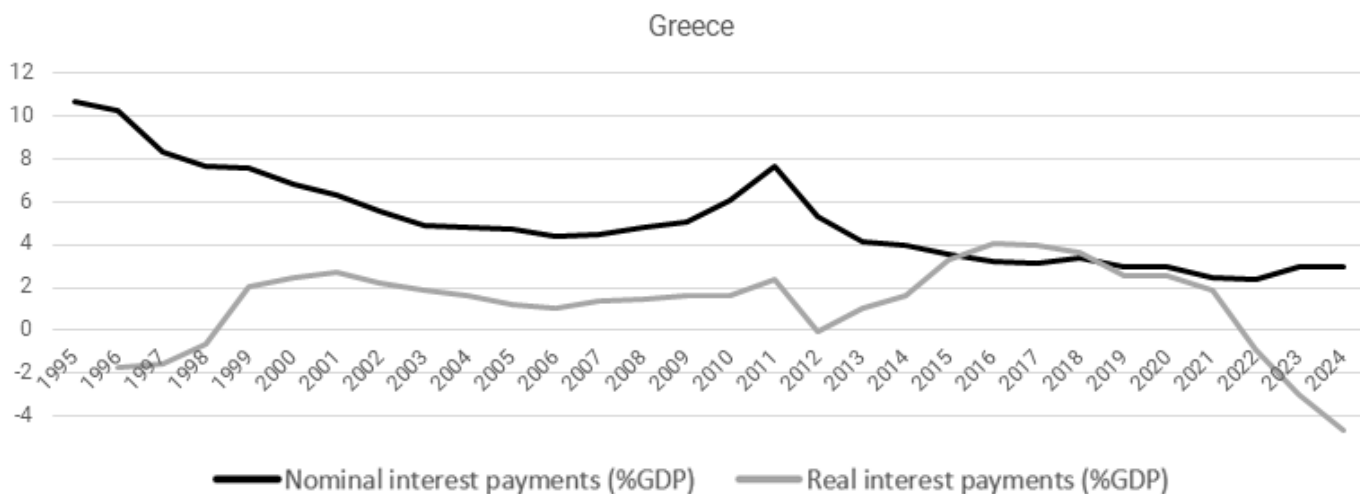
In all countries, aside from Greece, the nominal and real debt-service burdens move in tandem until 2021, after which time the two series diverge. The co-movement reflects the generally stable rates of inflation countries have experienced for two and half decades. That the series are generally not far apart reflects the fact that inflation has also been low, in line with national central bank and ECB policy. Greece is the exception, as, long before the recent bout, it had both severe inflation problems and high debt through the 1990s. Real debt service was higher in Greece post-financial crisis due to negative inflation.

Since the return of inflation from 2021 and beyond, the trend in nominal debt service changes little, except for in France, where it increases considerably. In all four countries, real debt servicing falls markedly and, in fact, turns negative. The decline in debt service on a real basis has been most pronounced in Greece and then Italy. This is more a result of higher accumulated stocks of debt than it is higher inflation or GDP growth. With higher stocks of debt, the erosion impact of inflation is magnified. The main point is that, as with the debt to GDP ratio, understanding the impact of higher interest rates in recent times needs to be considered jointly with the impact of higher inflation.

Figure 5. Real and nominal debt-service burden (% GDP).







Sources: Eurostat and OECD.

### 4.3 Beyond debt and deficits: servicing debt and other issues

Given that it is not the level of debt, but the current and future repayment of debt, that imposes a cost on the economy, and that debt levels and debt-servicing burdens have been diverging, the conclusion would appear straightforward: one should focus on trends in debt servicing as a guide to public financial sustainability. While we agree that this is a sensible strategy, the conclusion is complicated by a number of factors. These relate to how to correctly measure and forecast debt servicing, what constitutes an unsustainable trend in public finances, and how to control for an inevitable plethora of confounding factors, not least of all political economy factors and monetary policy.

What constitutes debt sustainability is an open question. The original rationale for 60% came from the average debt levels among EU countries at the time, and required nominal economic growth to be an unrealistic 5%.<sup>105</sup> Given the vastly different macroeconomic circumstances today and likely into the future, and the arbitrary principles upon which the original debt and deficit targets were based, they are clearly not fit for purpose in the current environment.

The recent history of sovereign stress and sovereign crises may provide an insight into what level of debt is unsustainable. But like debt sustainability, what constitutes a sovereign debt crisis is also open to interpretation. The European Systemic Risk Board compares its classification of crises over the last 50 years with the IMF database.<sup>106</sup> It finds significant but ultimately incomplete overlap. Moreover, countries may adopt fiscally unsustainable policies, but ultimately avoid a sovereign debt crisis through fiscal austerity or perhaps through debt monetisation and inflation.

Assuming a reliable definition of sovereign debt and crisis can be agreed upon, there are other complicating factors that prevent future sovereign debt problems being predicted from the soundness or not of a country's fiscal policy. International factors, such as unfavourable trade developments, war and natural catastrophes, can derail a seemingly sound fiscal stance. Similarly, banking and other types of financial crises can quickly morph into sovereign debt crises. Ireland, for instance, ran budget surpluses and had among the lowest levels of indebtedness in the EMU during the 2000s. It later underwent a sharp sovereign debt crisis, as it experienced a severe recession and recapitalised its banks. While fiscal rules attempt to address this through examining structural budget deficits, as discussed, these are unobservable.



A related complicating issue is monetary policy, which was unaccommodating during the financial crisis and which EMU member states only influence rather than control. Under most monetary systems, it has typically been understood that central banks will intervene and purchase their state's debt when it comes under pressure from financial markets, especially when an increase in yield is unrelated to a country's underlying fundamentals.<sup>107</sup> This has not been the case throughout most of the EMU's history. For instance, Spain had somewhat more favourable debt and deficit dynamics than the UK in 2011. Spain, however, quickly found itself mired in crisis, as the ECB, unlike the Bank of England, refused to commit to purchasing sovereign debt with sufficient force to bring yields down.<sup>108</sup> Ultimately, Spain experienced a sovereign debt crisis, but the UK did not. Again, while this may ultimately manifest itself in rising debt-servicing costs and higher levels of debt, the prior trajectory of debt dynamics may be a poor predictor of sovereign debt stress, especially if there is uncertainty around a central bank's commitment to intervene.

In dealing with a crisis, countries excluded from international financial markets may resort to so-called financial repression.<sup>109</sup> This refers to a wide set of potential policies aimed at reducing borrowing costs, including compelling domestic banks to hold government bonds. The central bank may also purchase government bonds, which, while containing borrowing costs, can induce inflation later on. In that case, debt and debt-servicing dynamics may not only fail to predict financial stress, but could even fail to identify an ongoing crisis. These options are, of course, unavailable to eurozone countries but should be borne when drawing on international evidence linking debt, deficit and servicing dynamics to fiscal sustainability.

Countries may try to forego default, restructuring or international assistance, despite a sharp deterioration of financing conditions, such as a large rise in interest rates. A country that has locked in enough funding to fulfil its near-term obligations may see if the rate increase is temporary. If the increase is likely to be permanent, long-term funding enables a country to take corrective action through

higher taxes or reduced spending, improving its creditworthiness. Otherwise, it would have to go to the markets and borrow at high rates, and undergo a sharper and perhaps larger consolidation. The length, maturity or duration<sup>110</sup> of a country's borrowing is, therefore, an important consideration that can temper the costs of servicing debt that an adverse shock would otherwise have. A country will have to refinance its debt at some stage, so it cannot fully insulate itself from rises in interest rates. Still, the maturity of European and advanced-country debt has steadily lengthened over the last number of decades.<sup>111112</sup>

Other factors to consider are the investor base and the share of fixed versus floating debt that a country has issued. If a country has a high share of foreign investors versus domestic investors, the country may be more vulnerable, as foreign investors may be quicker to sell. Countries with a high share of foreign-denominated debt, such as emerging-market EU countries that do not use the euro, may be vulnerable to currency movements. Finally, variable-interest-rate debt renders a country vulnerable to changes in interest rates, not only through refinancing but on the price of servicing its historic debt.

#### **4.4 Debt and debt service as predictors of financial stress: descriptive statistics**

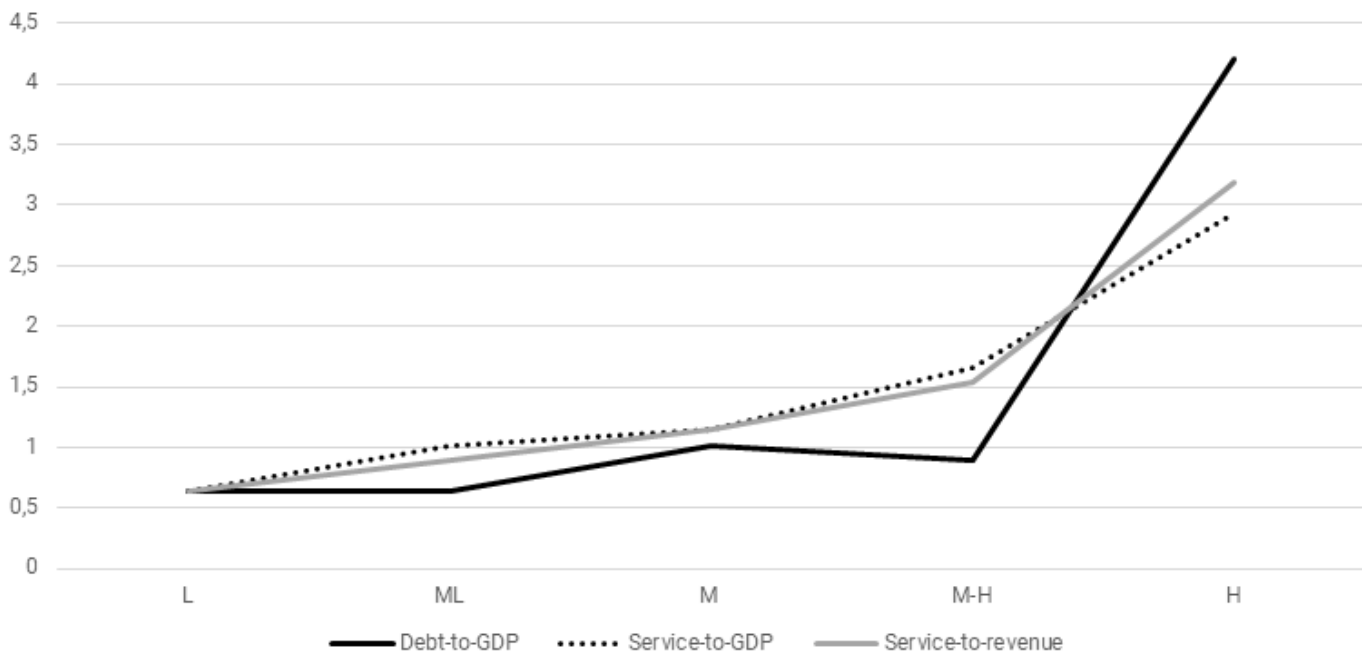
Before looking at how different metrics perform, some comments on how to define debt servicing are warranted. The nominal interest payments to GDP ratio is perhaps the most commonly used metric. The real interest rate to real GDP ratio is favoured by Furman and Summers as being more meaningful, in that it accounts for inflation.<sup>113</sup> Another candidate is the interest payments to revenue ratio. This may be favoured as it points to the share of resources available to the government being used to service debt, within a government's ability and willingness to tax its society.<sup>114</sup> This could be superior to interest payments to GDP if a government's willingness or ability to generate revenue or tax to service its debt is weak.

With these caveats in mind, Figure 6 looks at EU member states' financial sustainability since the 1970s. It plots the percentage frequency that a country has experienced a "sovereign episode" against the level of public financial stress. It looks at three different measures of stress or financial sustainability: gross public debt to GDP ratio; nominal interest payments to GDP ratio; and nominal interest payments to government revenue ratio. It divides financial stress data into quintiles: low; medium-low; medium; medium-high; and high. The threshold for a country in a given year being in the bottom quintile for debt to GDP ratio is 29.8%, beyond which it is in the medium-low group. The threshold for it being in the medium-high quintile group is 83.8%, beyond which it is grouped as highly indebted. A value of 60% of GDP is in the medium-indebtedness group.

The respective figures for interest payments to GDP are 1.1% and 4.5%, and for interest payments to revenue are 2.9% and 10.5%.

A country is deemed to have undergone a sovereign episode if it meets any one of a number of criteria. The criteria are (1) experienced a sovereign debt crisis, according to Lo Duca et al.;<sup>115</sup> (2) experienced a sovereign debt crisis or sovereign debt default or restructuring, according to Laeven and Valencia;<sup>116</sup> (3) experienced domestic or external debt default or restructuring, according to BFFSS;<sup>117</sup> and (4) experienced an inflation crisis, according to the BFFS project.<sup>118</sup> If any member state in any given year experienced any one of these, then that member state is categorised as having experienced a sovereign episode in that year.

**Figure 6. Sovereign debt episode frequency and financial sustainability.**



**Sources:** Debt, interest payments and revenue data are taken from IMF Government Finance Statistics, Eurostat and Macroeconomic Lab. Sovereign episode data are taken from Lo Duca et al. (2021), Laeven and Valencia (2020) and BFFSS (2022).

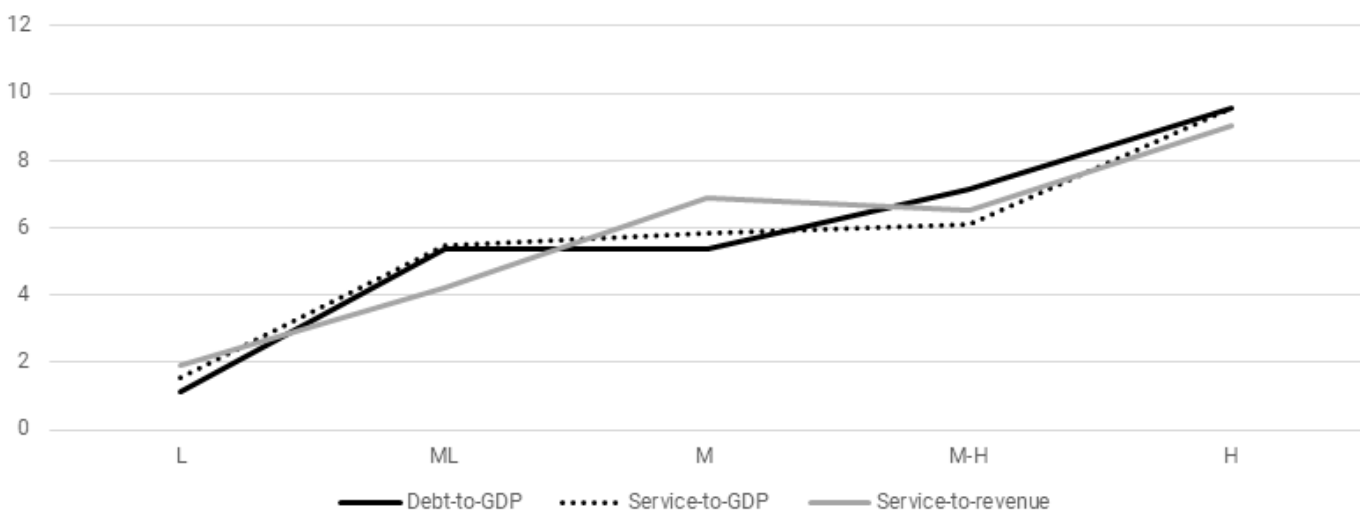
We see that the three measures perform similarly. The sovereign episode frequencies for low levels of debt to GDP, low debt service to GDP and low debt service to revenue are all 0.6%. This means that since the 1970s, when countries have had low levels of indebtedness, for instance, in 99.4% of cases, the countries have not experienced a sovereign debt episode. We see that high levels of debt are more hazardous than low levels of debt, as there is a big jump between medium-high and high levels of debt. This is not to say that high levels of debt are more hazardous than high levels of debt servicing. Rather, it is that the move from medium-high to high levels of debt entails greater risk than the corresponding move on the debt-servicing measures – the debt-servicing measures already had elevated risk as medium-high levels of servicing.

This suggests that developments in debt servicing are likely to provide an earlier warning. Interestingly, both interest payment to GDP and interest payments to revenue increase monotonically (or steadily) with respect to frequency. Medium levels of debt would appear to be more benign than medium-high levels of debt. This hints that debt developments are a somewhat less reliable predictor of future stress.

Figure 7 repeats the above exercise but adds one more criterion: whether a country is engaging in fiscal consolidation. The rationale is that a country could have pursued unsustainable fiscal policies but avoided a sovereign episode, as defined above, by engaging in austerity.

The literature identifies fiscal consolidation using two approaches: the traditional approach and the narrative approach.<sup>119</sup> The traditional approach defines a fiscal adjustment as an improvement of the cyclically adjusted primary balance in excess of a chosen threshold, in our case, in excess of 0.5% of GDP for two consecutive years, as per Afonso and Alves.<sup>120</sup> The narrative approach is based on the study of historical documents to identify fiscal adjustment episodes. It examines announced budget plans and national laws, and detects measures and actions aimed at deficit reduction, as described in policy documents.<sup>121</sup> When either of these criteria is met, a country is deemed to have undergone fiscal consolidation. When a country in a given year fulfils any of the criteria in Figure 6, or undergoes either measure of fiscal consolidation defined here, it is deemed to have undergone a fiscal episode in that year.

**Figure 7. Fiscal episode frequency and financial sustainability.**



**Sources:** Debt, interest payments and revenue data are taken from IMF Government Finance Statistics, Eurostat and Macrofinance Lab. Sovereign episode data are taken from Lo Duca et al. (2021), Laeven and Valencia (2020) and BFFSS (2022).

We see that the three measures perform very similarly. The sovereign episode frequencies for low levels of debt to GDP, low debt service to GDP and low debt service to revenue are all near 2%. This means that since the 1970s, when countries had low levels of indebtedness, for instance, in 98% of cases, countries have not experienced a fiscal episode. In around 9% of cases of high levels of stress, across all three measures, countries experience a fiscal debt episode.

The interest payments to GDP ratio is now the only measure that increases monotonically with respect to episode frequency. Each increase in level, as we move from low to high, results in an elevated level of risk. In contrast, medium levels of interest payments to revenue appear to be more benign than medium-high levels, whereas medium-low levels of debt appear more benign than medium levels. This hints at greater reliability of the debt service to GDP ratio.

In summary, emphases on debt and deficits do not capture the cost of borrowing, especially in an era of low interest rates. Conceptually, the debt-servicing burden coupled with considerations about the composition of debt are more meaningful indicators. Despite this, the fiscal rules attach central importance to debt and deficit. The descriptive statistics presented in this section indicate that debt is not a better guide to financial sustainability and may, in fact, be inferior.

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# **5. PREDICTING CRISIS: AN ECONOMETRIC ANALYSIS**

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# 5. PREDICTING CRISIS: AN ECONOMETRIC ANALYSIS

This section provides an empirical analysis aimed at identifying the variables that best act as leading early warning signals for public finance sustainability stress. It examines the determinants of the probability of stress econometrically and finds that the debt-servicing burden is a more powerful predictor of financial unsustainability than the deficit or debt.

## 5.1 Model and data

Safeguarding fiscal sustainability and preventing a crisis are among the main concerns of policymakers. Our contention has been that it is the burden of servicing debt and not the level or increase in the level of debt that is of relevance for financial sustainability. Conceptually, it is not debt per se, which can be rolled over, that imposes a burden, but the resources devoted to servicing it. The descriptive statistics in the previous section also suggest that debt service is a better predictor of sovereign stress.

A number of studies have investigated various episodes of crisis and/or financial distress, with the aim of drawing policy lessons, addressing vulnerabilities and limiting them. The literature has provided different criteria to identify the occurrence of a crisis and has developed different methodologies for detecting the risk that a crisis may arise.<sup>122</sup> Those methodologies are represented by the signals approach,<sup>123124125126</sup> discrete choice models, i.e., logit models<sup>127128129130</sup> and machine-learning techniques.<sup>131132133</sup>

To study the effects on the probability of crises, our model relies on a crisis indicator as the outcome variable and uses it to model the probability of an episode of distress conditional on public debt, public deficit and debt-servicing burden. In each period, countries are either experiencing a crisis or

they are not. Data are in annual frequency and were collected using various sources, as in the previous section. Three hundred episodes are detected in the sample, 133 of which took place after 2008.

The first independent variable is the debt to GDP ratio; the second is the primary balance, which excludes the interest payment component of the deficit or surplus; and the third variable is interest payments. All three are expressed as percentages of GDP. The model can be written as:

$$SE = \beta_0 + \beta_1 DEB + \beta_2 PB + \beta_3 INT + u \quad (16)$$

Where SE denotes sovereign episode, which takes a value of zero if there is no episode and one if there is. DEB, PB and INT denote debt, primary balance and interest payments to GDP ratio, respectively. We expect all coefficients to be positive, meaning, as they increase, the likelihood of an episode increases. A more complete description of the model can be found Box 5.

### Box 5. Logistic regression to predict sovereign episodes

The model estimates the probability of a sovereign crisis episode using a logit model, also known as logistic regression. The model allows for modelling binary-dependent variables, which take a value of either zero or one. One can estimate the probability that an event ( $y$ ) occurs at a particular time and in a particular country, conditional on  $j$  explanatory variables ( $x$ ). In its simplified form, the model can be specified as follows:

$$y_{it} = \beta_0 + \sum x_{jt}\beta_j + u \quad (17)$$

where  $\beta_0$  and  $\beta_j$  are unknown coefficients and  $u$  is the error term. The response variable,  $y_{it}$ , is the binary variable. The variable takes a value of one when the crisis episode occurs in country  $i$  at time  $t$  and takes a value of zero otherwise:

$$y_{it} \begin{cases} 1 & \text{if country } i \text{ in year } t \text{ experiences an episode} \\ 0 & \text{otherwise} \end{cases}$$

From the estimated coefficients ( $\beta_j$ ) of the model, it is possible to calculate the estimated probabilities of the event. The probability that the dependent variable is one, that is, the probability that the event happens, is given by:

$$Pr(y = 1|x_j) = F(\beta_0 + \sum x_{jt}\beta_j) = \frac{1}{1 + \left(\frac{1}{e^{(\beta_0 + \sum x_{jt}\beta_j)}}\right)} \quad (18)$$

and conversely, the probability the event does not happen is given by:

$$Pr(y = 0|x_j) = 1 - Pr(y = 1|x_j) \quad (19)$$

It is important to clarify that logit coefficients ( $\beta$ ) are all expressed in log odds units, and they cannot be read as a standard ordinary least squares coefficient. They have to be transformed, by taking the exponential of the regression coefficients. In fact, logistic regression models use a parameter called the odds ratio (OR), which allows the relationship between the dichotomous response variable and the predictors to be quantified. The OR represents the probability of the event occurring divided by the probability of the event not occurring:

$$OR = \frac{Pr}{1-Pr} \quad (20)$$

It is the ratio of the probability to its counterpart. That is, it is the ratio of the probability that the event occurs ( $Pr$ ) to the probability that it does not occur ( $1 - Pr$ ). Coefficients can also be interpreted by calculating the marginal effects, which show the change in probability when the independent variable increases.



## 5.2 Results

As discussed in Box 5, coefficients from logistic regression belie straightforward explanation, but can be transformed to give meaningful interpretations.

Table 1 illustrates the derived marginal effects, which give the change in the probability of an event for a given change in an independent variable. A positive (negative) coefficient means that higher levels of the associated macroeconomic indicator increase (decrease) the probability of an event.<sup>134</sup>

**Table 1. Conditional probability of a sovereign episode.**

	Marginal effects	OR	LPM
<i>Debt to GDP ratio</i>	0.034*** (0.006)	1.035*** (0.006)	0.002*** (0.000)
<i>Primary balance</i>	-0.192*** (0.050)	0.825*** (0.041)	-0.012** (0.004)
<i>Debt-servicing burden</i>	0.343*** (0.10)	1.410*** (0.152)	0.011* (0.031)
<i>N</i>	846	846	846
<i>Chi<sup>2</sup></i>	46.58***	46.58***	
<i>F-test</i>			27.04***

**Sources:** Debt, interest payments and revenue data are taken from IMF Government Finance Statistics, Eurostat and Macroeconomic Lab. Sovereign episode data are taken from Lo Duca et al. (2021), Laeven and Valencia (2020) and BFFSS (2022).

**Note:** \*\*\*, \*\*, and \* denote significance at 1%, 5%, and 10%, respectively.

The model appears well specified. The chi-squared test shows the joint significance of the regressors and rejects the hypothesis that the coefficients are jointly equal to zero, at 1% significance level. The logistic regression coefficients are highly significant and present the expected signs.

The logistic regression confirms evidence emerging from the descriptive statistics presented in the previous section. The likelihood of a sovereign episode increases as the level of debt increases. In particular, a one percent increase in the debt to

GDP ratio increases the probability of a sovereign episode by almost 0.034%, holding other variables constant. A percent increase in the debt-servicing ratio to GDP increases the probability of an event by 0.34%, all else being equal. The likelihood of an episode falls as the primary balance increases. A one percent change increase in the primary balance reduces the likelihood of an event by 0.19%, holding other variables constant. Alternatively, a percent increase in the deficit raises the probability of an event by 0.19%.

Similar to the previous section, we also model the effects of changes in the three variables on the likelihood of a fiscal event (Table 2). This means that the dependent variable includes various measures

of sovereign stress and crisis, but it also includes episodes of fiscal consolidation. The definition of an event is therefore broader.

**Table 2. Conditional probability of a fiscal episode.**

	Marginal effects	OR	LPM
<i>Debt to GDP ratio</i>	0.019*** (0.004)	1.019*** (0.004)	0.005*** (0.000)
<i>Primary balance</i>	-0.068** (0.027)	0.934** (0.025)	-0.011** (0.004)
<i>Debt-servicing burden</i>	0.148*** (0.054)	1.160*** (0.063)	0.041*** (0.010)
<i>N</i>	846	846	846
<i>Chi<sup>2</sup></i>	46.58***	46.58***	
<i>F-test</i>			30.85***

**Sources:** Debt, interest payments and revenue data are taken from IMF Government Finance Statistics, Eurostat and Macrofinance Lab. Sovereign episode data are taken from Lo Duca et al. (2021), Laeven and Valencia (2020) and BFFSS (2022).

**Note:** \*\*\*, \*\*, and \* denote significance at 1%, 5%, and 10%, respectively.

Again, the model is well specified, and the Chi-squared test shows the joint significance of the regressors, rejecting the hypothesis that the coefficients are jointly equal to zero at 1% significance level. The logistic regression coefficients are highly significant and present the expected signs. In particular, a one percent increase in the debt to GDP ratio increases the probability of a fiscal event by almost 0.02%, holding other variables constant. A percent increase in the debt-servicing to GDP ratio increases the probability of an event by 0.14%, all else being equal. The likelihood of an episode falls as the primary balance increases. A one percent increase in the primary balance reduces the likelihood of an event by 0.06%. Alternatively, a percent increase in the deficit raises the probability of an event by 0.06%.

Our results show that all three indicators elevate the risk of public financial sustainability stress, but that an increase in debt servicing poses a greater risk than a widening of the deficit or a rise in debt, all else being equal. The results, therefore, corroborate the previous section, which emphasised the need to focus on debt servicing.

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# 6. DISCUSSION AND POLICY

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## 6. DISCUSSION AND POLICY

This policy study has looked at arguably the most important aspect of economic governance in the EU today: the fiscal rules. It has long been recognised by economists that the main debt and deficit anchors upon which the rules are based are arbitrary, with little grounding in economic theory, evidence or insight. As the rules have evolved, layers of complexity have been added, with greater reliance on unobservable and difficult to estimate variables. This has led to more scope for interpretation, discretion and error. The rules have been repeatedly breached and have failed to prevent sovereign stress and crises. Given the reluctance of governments to cut current spending or increase taxation, the rules are, moreover, an effective barrier to expanding public investment, a prerequisite for meeting Europe's climate challenges.

As unedifying as it may be to base the central pillar of economic governance on capricious theoretical constructs, the analysis presented in this policy study goes a step further. It is not only the unobservables that are problematic, but so is the centrality given to its two founding principles: the level of debt and the government balance – a large debt that requires little service is not a drain on resources. The emphasis on debt and deficits is misplaced conceptually, and is a poor guide for sound budgetary policy.

The EU has major challenges ahead of it in the coming years. Most urgent is the need to tackle climate change, and the public investment it requires will have to compete with the fiscal demands of societal ageing, as public investment has done in the past. It is of utmost importance that the EU's system of economic governance facilitates, not hinders, those challenges. This policy study showed that the EU's highest-income countries devoted large amounts of resources to public investment to help build and rebuild those economies. Solidarity among member states demands that those countries that have greatest need for public investment are not prevented from doing so. Prevention of environmental destruction demands that all countries invest – and invest big.

The following recommendations include high-level, aspirational policies based on what we believe make most sense from an economic perspective and given the challenges that the EU faces. We are cognisant of the political realities of the EU, the fiscal conservatism of Germany and other core countries, and the economic thinking within national and European institutions. We therefore make a series of lower-level technical recommendations on how the fiscal rules may be amended, which are more likely to gain political traction.

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*The level of debt and deficit do not, in and of themselves, impose financial burdens on states.*

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*Debt and deficit targets should be subordinated to debt servicing in reformed fiscal rules. We believe that the 1/20th debt-reduction rule should be scrapped.*



### **6.1 Replace fiscal rules with fiscal standards focused on debt servicing**

The current make-up of the fiscal rules is based on a number of unobservable variables and a number of observable variables with arbitrary thresholds that would, in any event, be inadequate even if revised. Grounding fiscal policy in the calculation of OGs is highly problematic, whether through a structural deficit target or expenditure rule. Accordingly, reference to OGs in any revised rules should be abandoned. Going a step further, this policy study has emphasised that the level of debt and deficit do not, in and of themselves, impose financial burdens on states. They are, of course, not inconsequential, as higher values increase debt servicing. Ratings agencies also pay attention to them, such that large movements can impose real costs through rating downgrades, even if changes in economic fundamentals are more limited.<sup>135</sup> Ultimately, however, it is through the burden of servicing debt that such a deterioration is realised. We therefore believe that debt and deficit targets should be subordinated to debt servicing in reformed fiscal rules. We believe that the 1/20th debt-reduction rule should be scrapped.

As with debt and deficits, there is no single level of debt servicing that can be identified as unsustainable or leading to unsustainability.<sup>136</sup> The risk that a given level of debt service poses to a member state will be

context specific. Priewe recommends a net interest burden (taking account of payments to the central bank and taxation on interest income) of 3% of GDP,<sup>137</sup> whereas Furman and Summers suggest real net payments should not exceed 2%.<sup>138</sup> Our analysis in Figure 5 suggested a significant increase in risk of a sovereign episode after medium-high levels of gross debt service, which was 4.5% of GDP. Below this level, comparatively few countries have been in crisis.

For prudence purposes and as a compromise, a nominal net interest burden in excess of 3% could be considered cause for alarm. The threshold would form part of a broader debt sustainability analysis, which would examine the current debt-servicing burden, as well as the future debt-servicing burden. Such an analysis would require modelling an uncertain future and stress testing under various scenarios. A version of the existing debt sustainability analysis is the most obvious framework to use. The analysis would include current reference to, and stress testing of, the debt service to revenue ratio, the debt to GDP ratio and the government balance. Reference to these variables would be made in terms of their impact on the debt-servicing burden and as auxiliary variables in their own right. As per Furman and Summers, projects beyond a horizon of ten years should be given little weight.<sup>139</sup>



*We propose that debt composition is an important accompanying consideration of a revised fiscal framework that emphasises the burden of servicing debt.*



## **6.2 Examine the debt maturity profile and composition**

A key consideration when relying on debt servicing to guide sustainability is the risk that interest rates rise. In that case, the cost of debt rollover becomes higher in the future. If the rise in interest rates is temporary, and if a state has sufficient finance locked-in, and so, does not have to refinance itself in the near future, then it can wait until rates have normalised before rolling over its debt, thus insulating itself from the temporary rise in rates. Even if the increase in interest rates is permanent, and provided the state has sufficient finance locked-in, the country can improve its financial position through gradually increasing taxation or reducing spending. In that case, the cost of rolling over an existing debt will be lower due to its improved creditworthiness, and the need to finance new deficits at now higher interest rates will also be lower. It would not be able to do so without painful and damaging frontloaded adjustments if an inordinate amount of its debt were short term. Having a sufficient amount of debt that is not due in the short term is, therefore, an important buffer against refinancing risk.

Moreover, if a significant portion of the debt is variable-interest debt, then higher interest rates will require higher coupon payments, regardless of the maturity profile. A number of factors are, therefore, relevant when considering the risk that interest rates rise, including the fixed versus variable composition of debt, the average time to maturity of debt, debt duration and avoidance of redemption peaks.<sup>140</sup> Countries with longer-dated debt and

that is of mostly fixed interest will be considered less vulnerable to refinancing risk. Debt that is denominated in a country's own currency and with a stable investor base is also favourable. Although foreign currency and variable-interest government debt are comparatively small components of EU government debt in aggregate, this is not true for all member states.<sup>141142</sup>

Of course, existing debt sustainability analysis takes into account the composition of government debt in the context of a general concern about the development of the debt to GDP ratio. We propose that debt composition is an important accompanying consideration of a revised fiscal framework that emphasises the burden of servicing debt.

## **6.3 Focus on observable variables: 100% debt to GDP ratio is best**

At the time of writing, the rules have been suspended, and there is great uncertainty surrounding what they will look like in the future. The latest thinking among policymakers is that a considerable overhaul of the rules is warranted, but that the original target of 60% debt and 3% deficit are to be retained. As discussed, the latest proposal is that the Commission undertakes a debt sustainability analysis and puts forward a "reference adjustment path" as a starting point. Member states then respond with a medium-term fiscal adjustment plan, which includes plans for investment and the potential to extend the four-year implementation period. For medium- and



*A combined 100% debt target and 3% deficit target – aligned with country-specific debt-reduction plans that exclude unobservable variables and make allowances for green investment – would be a major leap forward.*



high-risk debt countries, the adjustment indicator is primary net expenditure, with reference to the 1/20th debt reduction removed, and the structural balance demoted to the initial sustainability analysis only.

The European stability mechanism has suggested an upper limit for the debt to GDP ratio of 100%,<sup>143</sup> combined with an expenditure rule and a government balance limit of 3%. A combined 100% debt target and 3% deficit target – aligned with country-specific debt-reduction plans that exclude unobservable variables and make allowances for green investment – would be a major leap forward. Given the current state of fiscal rules, which are not fit for purpose, we would also endorse such a reform.

#### **6.4 A climate investment fund**

As already discussed, the current rules make it extremely difficult for member states to leverage public investment at the level required to meet their emissions targets. The most recent proposal is that green and other types of investment will be taken into consideration when member states and the EU agree on a medium-term fiscal adjustment plan. While this is welcome, it is unlikely that a member state's investment plan, including climate-related investment, will be fully detached from its underlying fiscal and debt dynamics. Highly indebted countries are more likely to struggle to reach their climate investment targets than countries whose fiscal

position is sounder. This is a problem as many of the highly indebted countries, such as those in southern Europe, have high investment needs.

It has long been recognised that a monetary union can only function properly in the presence of some sort of a fiscal union. Similarly, tackling climate change requires policies that go beyond the level of the nation state. A permanent EU climate investment fund would facilitate the much-needed energy, transport and other investments required to meet the EU's emission targets. It would also avoid procyclical cuts to climate-related investment during downturns.

For Heimberger and Lichtenberger, the fund could be based on the Next-Generation EU model.<sup>144</sup> Funds would be disbursed to member states after negotiation according to need. The fund would be financed by EU bonds, so the liability would remain with the EU. Any funds disbursed to member states would then not add to national public indebtedness, so that compliance with fiscal rules would not arise. If disbursement of funds were to be dependent on national match funding, then the match funding part would add to national spending, debt and deficits. In that case, as under the most recent reform proposals, national match-funding green investment would be taken into account in the medium-term adjustment path thereby mitigating the need for consolidation. The common fund could finance half or more of the required increase in public investment needed, where estimates are that public investment will need to grow by between 0.5 and 1.8% of GDP.





*A combined 60% debt target and 3% deficit target – aligned with a country-specific debt-reduction plan over a four-year-plus horizon, which makes allowances for green investment, but removes reference to structural deficit and the 1/20th debt-reduction rule – would be an improvement on the current rule set.*



### **6.5 EB preferable to structural deficit target**

Many reform proposals recommend retaining an EB but removing reference to a structural deficit. The EB requires that net government spending should not exceed the rate of growth of potential output. This requires an estimate of potential output, and so is subject to measurement error. Moreover, the benchmark effectively requires that government spending remain constant as a share of national income, excluding increases in taxation. This limits public spending, as it is politically difficult to increase taxes. Much of this limit is unnecessary in an era of secular stagnation, as the rate of economic growth tends to exceed the interest rate, which enables states to run moderate deficits without threatening financial stability.

As above, the latest proposal effectively demotes the structural deficit from being a key target indicator to playing a background role in the initial sustainability analysis, but retains an EB rule. Existing EB rules use potential output calculated using an average between periods  $t-5$  and  $t+4$ . The structural budget balance rule, such as a requirement that the structural deficit does not exceed 0.5% of GDP, limits net spending based on an annual calculation of potential output. As discussed, calculation of potential output tends to be procyclical and subject to considerable revision. As the EB rule uses a medium-term perspective to calculate potential

output (growth), fluctuations in spending tend to be smoothed out and tend to be less procyclical than with a structural budget balance rule. An expenditure rule may also be favourable because net expenditure is under the direct control of governments, whereas the structural balance is not.

While the November 2022 review has not been finalised, we welcome the demotion of the structural deficit in favour of net primary expenditure. A combined 60% debt target and 3% deficit target – aligned with a country-specific debt-reduction plan over a four-year-plus horizon, which makes allowances for green investment, but removes reference to structural deficit and the 1/20th debt-reduction rule – would be an improvement on the current rule set.

### **6.6 Improve calculation of potential output**

The current rule set uses an aggregate production function to calculate the potential output of the economy, with labour capital and TFP being the key inputs. There are severe and, in some cases, intractable measurement problems with these variables. Nevertheless, provided the structural balance is to remain in the background, or if the main expenditure indicator is to be made with reference to potential output in the finalised version of the reform process (which is currently unclear), improvements can be made to the potential output measurement as it relates to the fiscal rules.

The labour inputs into the production function are calculated using NAWRU and a trend participation rate. As discussed by Bertram et al.<sup>145</sup> and Sigl-Glößner et al.,<sup>146</sup> both measures can be made less procyclical. Recall that an increase in NAWRU means that more unemployment is considered permanent, which lowers the estimate for potential output, and hence, the fiscal space. NAWRU estimates tended to be higher for countries hardest hit by the financial crisis. Much of the procyclicality arises from “endpoint bias”, in which more recent data are weighted more heavily. NAWRU could instead be based on a proxy of full employment, such as by deducting long-term unemployment from actual unemployment.

Using trend participation can generate procyclicality, as a recession can lead to more workers becoming discouraged, which lowers the trend participation rate in the coming years. This leads to a lower calculation for potential output. Bertram et al.<sup>147</sup> and Sigl-Glößner et al.<sup>148</sup> suggest using the labour-force participation rate consistent with full-capacity utilisation, as opposed to trend participation. As the capacity of the economy is presumably less affected by cyclical shocks than the trend participation rate, such a move would render potential output less procyclical.

They also propose a different measure of participation. If the participation rate is retained, a measure that assumes a narrowing of the gap between male and female labour force participation would expand the fiscal space. With more of the population available for work, potential output would be higher.

A combined 60% debt target and 3% deficit target – aligned with a country-specific debt-reduction plan over a five-year-plus horizon, which retains an expenditure rule based on improved measurement of the OG with allowances for green investment, but removes reference to structural deficit and the 1/20th debt-reduction rule – would be an improvement on the current rule set.

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# APPENDIX

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# APPENDIX

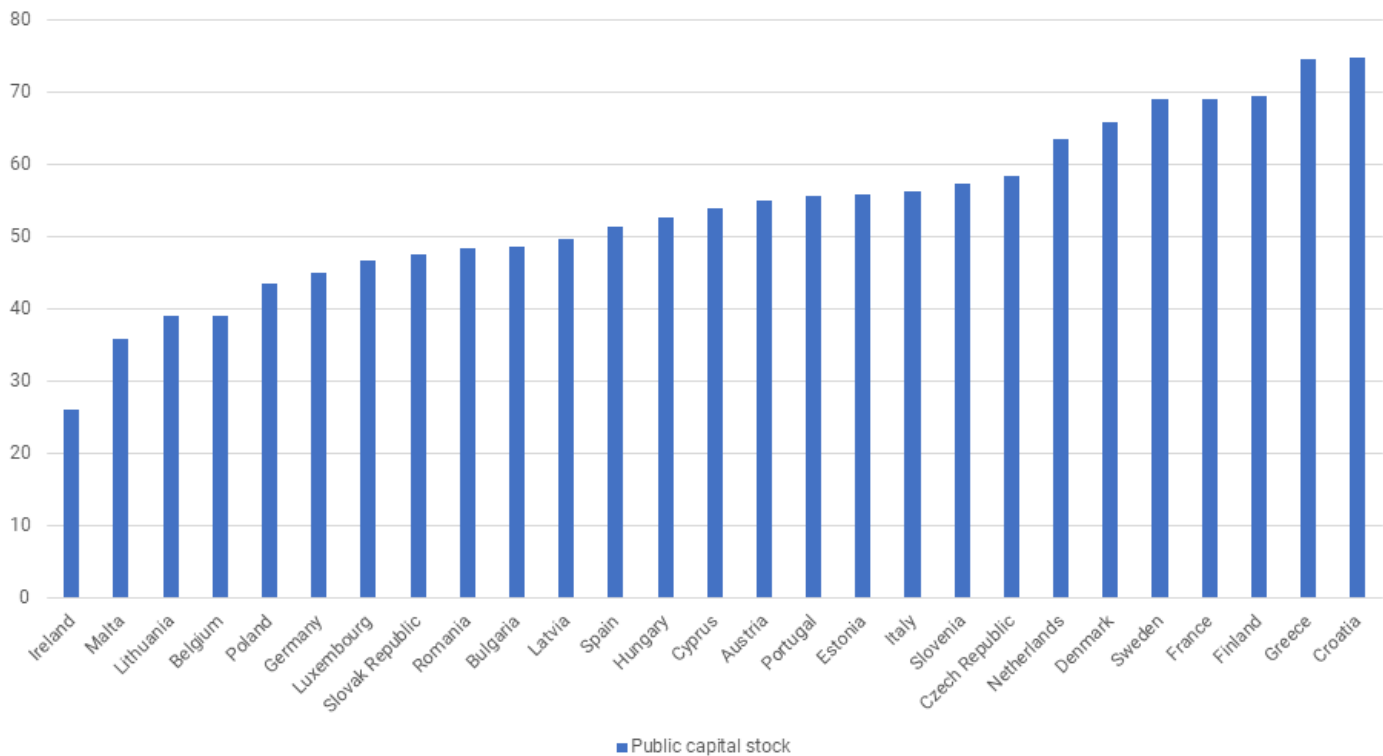
The stock of capital in a country is not well measured. As with investment, the boundary problem of what is public and what is private persists, as do the problems of cross-country differences in depreciation and the measure of intangible capital. On top of that, there is an aggregation problem. Capital goods, like all goods, comprise many categories of items, from buildings to roads, machinery and more. Measurement of capital goods in physical terms, such as the number of different types of specific goods, would therefore require conciseness. Though accurate, it would require many different categories of goods and would have limited usefulness for general analysis. As described before, measuring the capital stock in monetary terms depends crucially on the base year.

Nevertheless, the IMF Investment and Capital Stock Database measures the stock of public capital in monetary terms. It does so by assuming no public capital stock for an initial year (1860), and then assumes a certain rate of public investment until data on public capital formation become available. This gives an estimate of the stock of public capital until data on public investment become available, based on an assumed accumulation of public investment. Once data on investment become available, the capital stock is now based on the accumulation of observed public investment and standardised assumptions about the rate of depreciation.<sup>149</sup> This is obviously less satisfactory than calculating the stock of capital based on direct measurements of the assets themselves, notwithstanding the problems associated with this. Data should, therefore, be treated with a healthy dose of caution.

Data are in line with expectations, at least based on recent levels of public investment discussed in Section 3. As can be seen, Croatia and Greece have very large stocks of public capital. Figure 1 showed Greece as a major investor, while public investment in Croatia hovered around 6-7% of GDP pre-financial crisis. The Nordic countries also stand out as a

group for having high levels of capital, consistent with them being high public investors historically. Public investment in France has declined less than in Germany, which may explain its strong performance. Spain is somewhat below average, whereas Italy is about average. The seemingly poor performance of Poland is surprising.

Figure A. Public capital stock (% GDP).



Source: IMF Investment and Capital Stock Database, WEF (2020) and World Bank.

Notes: Data for central and eastern countries are generally not available before 1990. The base year for prices is 2017.

The series, however, says less about the quality of public investment or the level of public investment needed. Although there is a relationship between the level of capital stock and perceived infrastructural quality, as per survey evidence, the relationship is not strong. It is rather implausible that Belgium has a much higher need for public investment than, say, Greece, which appears to have a very high level of public capital. Other sources are needed as a complement.

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- This is arguably a more meaningful metric, as it measures the real burden of debt relative to real output, rather than mixing a real denominator and a nominal numerator. In Economy 2, debt servicing is only zero in real terms with respect to prices in year  $t-1$ . However, being an index number, it can only be defined with respect to a base year in a country. It is, therefore, less appropriate for international comparative purposes.
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The EU fiscal rules are one of if not the most discussed aspects of EU economic policymaking. With the impact of COVID-19 and the impending climate catastrophe, it is almost unanimously agreed that they are in need of reform. Midst the pandemic, fiscal rules have been suspended and the EU put in place a series of unprecedented measures in Europe's history.

The EU's regime of fiscal governance, enshrined in the Stability and Growth Pact and the Fiscal Compact, is perhaps the strictest of any region in the developed world. This policy study aims to assess what reforms can be made to ensure the sustainability public finances across the EU, enable much-needed climate investment while preventing the growth of inequality between and within member states:

This study provides an in-depth analysis of the fiscal rules, their evolution, and their shortcomings, and how they may be reformed. As Europe has emerged from repeated crises in recent years, it is of utmost importance that governance ensures sustainable prosperity for all.

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