



# Fiscal Policy in an Age of Secular Stagnation

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## Abstract

An on-going period of secular stagnation in advanced economies has brought down interest rates, growth rates and inflation. Due to the relatively larger fall in interest rates, the differential between the interest rate paid on government debt and the output growth rate (IRGD) became lower and has even turned negative in most advanced economies. In such an environment, public debt may come at much lower (or even no) cost. Thus, if this pattern remains stable, it has important implications on the role of fiscal policy. Against this background, this paper discusses relevant long-term trends in Europe and aims to explain the currently low IRGD. Furthermore, it investigates possible future IRGD paths and its consequences for fiscal policy.

**Keywords** Fiscal policy · Secular stagnation · Debt dynamics

**JEL Classifications** E43 · E62

## Introduction

Advanced economies around the world have been experienced a period of low growth, low inflation and low interest rates over the past decade. This environment is known as “secular stagnation”, a term most prominently brought forward by Larry Summers who has shared his views in November 2013.<sup>1</sup> These circumstances have important consequences for fiscal policy and should be taken into consideration at the stage of decision-making. The objectives of fiscal policy are seen as to provide means to enhance welfare (e.g. providing public goods and address market failures), promote equal opportunities by addressing distributional disparities and use it as an instrument for macroeconomic stabilisation in the short-term and for long-term sustainability. Against this background, fiscal policy should seek to create buffers in “good times” in order to create space for necessary stabilisation actions. A central

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<sup>1</sup> Speech at the IMF Research Conference on 8 Nov. 2013.

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theoretic point is the assumption that governments face a inter-temporal budget constraint which limits fiscal space. A government borrows money and has to pay interest on its debt. Interest rates can also be seen as the “price of money”. If money becomes cheaper, e.g. interest rates decrease, it is more attractive to borrow. If the interest paid by the government is lower than the output growth induced by additional government spending even the budget constraint for the government does, in theory, not longer exist. This paper focuses on this very relationship, the so-called interest rate—growth differential (IRGD). A negative differential enables debt rollovers, e.g. debt decreases relative to GDP over time since GDP grows faster than interest payments.

Hence, a period of low interest rates entails important consequences for fiscal policy. Assuming stable growth,<sup>2</sup> lower interest rates lead to a more negative IRGD. Since the 1980s, real interest rates in advanced economies face a downward trend and the global financial crisis leads to a further drop. Since then, interest rates remained at (or close to) the zero lower bound (ZLB). Years of persistent low interest rates have lead to peculiar observations with regard to the value of money. For example Austria has issued a 100-year bond at an interest rate of just 1.2 percent; other countries have issued bonds with negative interest rates—e.g. bondholders pay for lending money.<sup>3</sup> Thus, a crucial question is whether this period and its accompanying consequences will persist or not. 100-year bonds are a sign that (institutional) investors expect low interest rates for a long period. Furthermore, there are several papers which show evidence that there is a sizeable decline in the “natural interest rate” in advanced economies.<sup>4</sup> This view is also supported by the recent COVID-19 pandemic, where interest rate reactions in response to sizeable government spending programmes were only minor in most countries.<sup>5</sup> The current economic crisis may even further decrease long-term interest rates (see Jordà et al. 2020). The conclusions reached in this paper should be seen in the context of a medium to long-term view. While the COVID-19 pandemic leads to a massive drop in economic growth and may also have short-term implications on interest rates, which means it affects also the IRGD, it should only have minor effects on the long-run IRGD.

In the following, I will argue that there is indeed growing evidence that the favourable IRGD in the past decade is not a temporary phenomenon but will persistent in advanced economies in the coming decades. This paper concludes that several structural factors such as demographic shifts, high inequality and lower economic growth contribute to lower interest rate levels while potential output levels continue to be on a low but steady level. Thus, it is likely that the IRGD will be negative in many Euro area member states over the next decades. As a raw numerical example: if one assumes an average nominal GDP growth rate in Euro area economies of around 3 percent, the IRGD continues to be negative as long as interest rates paid stay below

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<sup>2</sup> An assumption which is of course too simple, therefore, the role of GDP growth is discussed in more detail in “Methodology and Econometric Model” section.

<sup>3</sup> <https://www.bloomberg.com/opinion/articles/2019-06-25/a-100-year-austrian-bond-at-1-2-what-fresh-madness-is-this>.

<sup>4</sup> See e.g. Holston et al. (2017) or Williams (2015).

<sup>5</sup> A major reason in the current crisis is of course also expansive monetary policy programmes in advanced economies.



this value. This is in line with findings from Summers (2014) who suggests that the zero lower bound and secular stagnation are likely to stay in the future. I will show that fiscal policy makers should take greater account of this transition. The findings should not be seen as a free licence for higher debt levels but rather as an impetus for using additional space for effective public spending on a debt decreasing path. As I will show in my analysis, macroeconomic conditions are expected to be quite heterogeneous within the Euro area. While indicators in some countries show signs of a very favourable debt reduction environment in the future, fiscal space remains tight despite low interest rates in other EU member states and requires additional effort. The COVID-19 economic crisis underlines that past beliefs on fiscal deficits and their meaning for interest rates seem to lose importance. This longer-term trend of a changing economic environment requires a rethinking in fiscal policy.

Therefore, this contribution aims to fuel discussions on how economic policy circumstances are different now and in the decades to come and what implications this entails for fiscal policy making. This paper contributes to the literature by running an empirical forecast of long-term interest rate levels which builds on structural variables, such as demographic indicators or inequality. This stands in contrast to the interest rate mean reverse assumptions that are mostly used in economic models. Against this background, the findings have important consequences for long-term debt sustainability analysis and address potential issues in the existing assumptions of such models. Finally, it connects the argument of a lower or even negative IRGD in the coming decades to relevant economic policy questions in the Euro area, in particular, low public investment and the lack of an Euro area-wide stabilisation instrument.

The paper is structured as follows: section two gives an overview on the fundamentals of public debt development and discusses the potential future development of the key variables in this process. The third chapter explains the methodology and the econometric setting for the projections. Furthermore, it includes simulations and different scenario estimations on the IRGD and possible debt dynamics. Finally, the fourth and fifth chapters take the key points of the results in order to derive policy implications on how to best adapt fiscal policy to the new environment.

## Literature

The literature consists of three main parts. The first subsection explains the fundamentals of public debt development and presents the fundamental equations. The second part builds on these relations and discusses the specific determinants on the respective parts of the IRGD. The main focus will be laid on the determination of interest rates and economic growth, while inflation will be discussed only marginally. Long-term dynamics in inflation are assumed to depend on inflation expectations which rest on the central bank mandate. This chapter also discussed different estimates for long-term potential output projections. Compared to interest rate projections, most output forecasts tend to be very similar in size. Therefore, the big question mark in projecting the future IRGD is related to the development of interest rates. Against this background, this part will extensively discuss several factors



which are potential determinants of low interest rates such as demographic reasons or inequality. These arguments will also frame the econometric approach in Sect 3.

### The Development of Public Debt

The evolution of public debt (in relation to GDP) mainly depends on three main factors: the nominal interest rate which is paid on existing debt ( $i$ ), nominal growth of output ( $g$ ) and the primary balance (“ $p$ ”, e.g. the difference between government revenues and spending, excluding interest payments). For the sake of simplicity one-off measures, such as privatisation proceeds, off-budget operations or valuation changes due to exchange rate moves ( $dda_t$ ) are excluded in the following computations.<sup>6</sup> Therefore, the development of public debt to GDP can be expressed using the following equation:

$$d_t - d_{t-1} = d_{t-1} * \frac{(i - g)}{1 + g} - p_t + dda_t \quad (1)$$

If interest rates decrease substantially while trend growth abates less, *ceteris paribus*, there is more space for a negative primary balance without increasing debt levels. In the decades before the crisis, the differential has been positive for most of the time in EU member states with the exception of Greece, Ireland or Spain, where interest rates fell sharply after they became a member of the Economic and Monetary Union (EMU).<sup>7</sup> A positive differential withdraws the possibility of debt rollover and can result in a ballooning debt ratio and a debt crisis. This effect was observable in the euro area debt crisis where a sharp increase in interest rates and a drop in growth widened the differential substantially within a very short period and consequently pushed debt ratios upwards sharply. However, after the crisis the gap between interest rates and growth narrowed and became even negative in most member states. If this pattern remains stable, it opens up fiscal space and facilitates debt reduction.

### Contributors to Debt Dynamics

As shown in Equation 1 debt dynamics can be computed by investigating the role of interest rates, economic growth and the primary deficit [and the price level]. To understand the future macroeconomic environment, it is therefore necessary to analyse the development of these variables. Since the primary deficit is policy driven, the following part mainly focuses on the long-term development of (potential) output and interest rates.

<sup>6</sup> Public debt is assumed to be held entirely in domestic currency, which is a reasonable assumption for Advanced Economies.

<sup>7</sup> Compare Escolano (2010). Research including long-term datasets indicates negative differentials in the 1960s and 1970s. Blanchard (2019) shows that in the USA, a negative differential is more the rule than the exception in the last 200 years. Compare Escolano (2014) to get more details on the evolution and determinants of the IRGD. The differential tends to be more negative in non-advanced economies.



## Interest Rate

First, I will examine the drivers of future interest rates in the medium and long run. The nominal long-term interest rate has been decreasing in most advanced economies in the past decade, and many economists argue that they will remain low for the next decades as well.<sup>8</sup> According to Ciocytte et al. (2016), explanations for the downward trend can be divided in permanent (P) factors, some of them may build up even further in the future, temporary (T) and uncertain or policy-dependent (P/T) factors. Permanent factors include reductions in debt-financed investments, e.g. by lower set-up costs from “tech firms” than by conventional firms, a declining rate of population growth or shifts in the distribution of income between labour and capital income which can influence the propensity to save on the macro level. Temporary indicators include shifts in global capital flows which may tend to accumulate safe assets.<sup>9</sup> stagnation by Teulings

Rachel and Smith (2015) have estimated that real long-term interest rates have fallen by around 450 basis points (bps) over the last three decades. According to their calculations, around a quarter of this fall stems from a decline of the trend growth outlook (mainly because of demographic changes) and the rest from changing preferences (e.g. relative price of capital, shift in labour/capital ratio, etc.). They project the real rate at around 1 percent in the long run. An important factor is the role of the financial crisis in time series analysis and whether the circumstances following the crisis will become the new “normal”.

There are several directions in which demographics affect interest rates. First, an ageing population means lower population growth which slows down productivity and potential GDP, pushing down interest rates. Second, according to life cycle theory, households in their working life period are net savers and other age groups are net consumers. As people get older, they have more time where they are net consumers pushing interest rates up. Empirical findings suggest that the downward effect is stronger and ageing has a mostly negative effect on interest rates. Results from Carvalho et al. (2017) and Lisack et al. (2017) indicate that changing demographics related to population ageing is to a large extent responsible for lower interest rates and will have a long-lasting downward pressure effect on the natural rate of interest. According to Bean et al. (2015), the dominant factors of decreasing interest rates before the crisis were shifts in savings, associated with demographic developments and Chinese financial integration. Since the crisis changing preferences, e.g. a decline in the propensity to invest and changes in asset supply and demand, seem to have played a role too.

Figure 1 shows estimations on the decomposition of the changes in the equilibrium real interest rate based on Summers (2019). It can be seen that the main drivers of rising rates are more than offset by lower productivity growth and a shift in the working age–retirees relation. Their results indicate a persistently lower real rate over the long horizon.

<sup>8</sup> Compare VoxEU eBook on secular stagnation by Teulings and Baldwin (2014).

<sup>9</sup> Compare literature related to the so-called emerging markets savings glut.



Another hypothesis widely discussed in the literature<sup>10</sup> is the “global savings glut” hypothesis, which states that the desire of saving has been relatively stronger than the desire to invest. This structural disequilibrium may be the result of high savings rates in emerging markets (such as China). A way to capture the suggested overhang of savings over demand is the current account (CA) balance. If a country invests more domestically than it saves domestically, it needs to import these resources, e.g. the country has a CA deficit and vice versa. A country’s current account surplus is hence roughly the net amount of financial capital it is sending abroad. Even though CA surpluses have fallen substantially since the mid-2010s in emerging Asia, CA surpluses have risen significantly in the Euro Area, in particular, Germany. According to Bernanke (2015), the persistent large German surplus is troubling in a world which lacks aggregate demand. Whether the global savings glut hypothesis remains useful as a explanation for low interest rates depends on future developments, in particular, the movement of China towards a less export reliant economy, the lower build-up of foreign reserves in emerging markets and the development in European Union Member states external balances.

Another driver of lower interest rates is rising economic inequality on both the household and firm side. If a larger share of income goes to groups with a lower propensity to spend, a demand–supply disequilibrium arises. Lancaster (2016) uses a overlapping generations model which shows that a permanent increase in income inequality may lead to a persistent reduction in the interest rates. Inequality has risen significantly during the past decades; however, there have been diverging trajectories among advanced economies. While the share of income which went to the top earners increased substantially, growth was more inclusive in Europe. The rise in overall inequality can also be associated with a declining labour share. One of the explanations is that the increase in productivity has been driven by technological progress which is linked to the decline in relative price of investment. Thus, the cost of capital went down and it was more attractive to substitute capital for labour (see Lim and McNelis 2019). It is likely that the ongoing shift towards intangibles and the so-called Superstar Effects among mainly digital companies will contribute to a continuing decline. Thus, the future direction is uncertain and hence its impact on interest rates as well, but there are several signs which suggest rising inequality in the next decades too, even though the effect might be less pronounced in Europe (see Alvaredo et al. 2018).<sup>11</sup>

The same holds true on the corporate level. Analysis from the IMF (see Dao and Maggi 2018) has shown is a significant trend in rising corporate savings. Corporate savings have increasingly amounted to overall savings while household savings have remained mainly stagnant over the past decades. Instead of using sustained gains in profitability for higher investment, firms have build growing stocks of liquid assets on their balance sheets. Furthermore, companies with the strongest increase in cash

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<sup>10</sup> Compare, for example, Bernanke et al. (2005) and Bernanke (2015).

<sup>11</sup> According to estimations of the “World Inequality Report”, inequality will further increase in the “business as usual” scenario. However, if countries follow the inequality trajectory in Europe, inequality can be reduced.



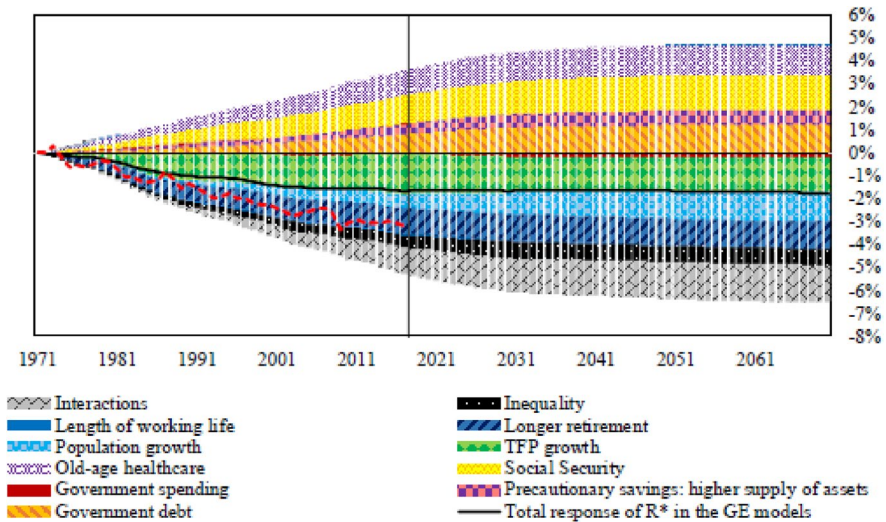


Fig. 1 Decomposition of the changes in equilibrium real interest rate. Summers (2019)

and savings also see the largest profitability, market value and Research and Development spending gains. With capital income shared less equal among the population, higher corporate savings may also reinforce wealth inequality and thus do not lead to higher consumption spending. Against this background, the rise in corporate cash holdings may have also contributed to current account surpluses.

Another important factor is the increasing demand for safe assets which leads to downward pressure on interest rates in advanced economies, considered as “safe harbours”. Blanchard et al. (2014) argue that in the 2000s foreign exchange reserves increased considerably and were invested to a large share in government bonds. A reversal in the near future is unlikely. Tighter financial regulation and higher capital and liquidity ratios lead to additional demand for safe assets by financial institutions. Research from OECD (2019) shows that the share of prime grade sovereign bonds issued as a percentage of total has decreased in the OECD from almost 90 percent in 2009 to around 20 percent in 2018. These results show a clear deterioration in sovereign bond quality in advanced economies. As demand from institutional investors has increased substantially<sup>12</sup> and is expected to increase even further in the future, excess demand for safe assets is likely to persist.

There exist different factors which aim to explain the low interest rate environment (at least in advanced economies). These factors are closely connected and may develop interactions which could make the effects even stronger. The OECD and the European Commission have applied projections for interest rates on a yearly basis up to 2060. These rates are used to compute IRGD forecasts. In addition, I built

<sup>12</sup> Research from the OECD shows that assets under management by traditional investors has increased fourfold in since 2000.



additional interest rate projections which are determined by economic fundamentals. The variety of models allows to construct a more comprehensive picture on interest rate developments and discuss potential different outcomes.

## Output Growth

In the following, I will examine plausible forecasts on growth dynamics, the second part of the IRGD. As growth is very volatile in the short run and fluctuates with the business cycle, the focus will be laid on potential output. The potential of economic activity is based on fundamental growth determinants. The model described by Solow (1956) attempts to explain long-run growth based on a Cobb–Douglas production function which is built on capital, labour and increases in productivity.<sup>13</sup> According to the standard model, economies converge to their steady state equilibrium and long-run growth is determined by technological progress. Since we are interested in long-term debt dynamics, the following analysis focuses on output growth based on the three fundamental production factors which can be shown in the following production function:

$$Y_t = A_t * K_t^\alpha * L_t^{(1-\alpha)} \quad (2)$$

$Y_t$  denotes real GDP,  $K_t$  and  $L_t$  represent capital and labour and their respective production shares and  $A_t$  is total factor productivity.  $L_t$  can be separated in a labour quantity and labour quality contribution. GDP growth can therefore be seen as the derivative of Eq. 2. In order to estimate long-term potential output, it is necessary to have appropriate estimates on the production factors. McQuinn and Whelan (2016) have decomposed euro area growth rates into the depicted factors. They found that the lower rate of TFP since 2000 is a major source of lower growth in recent years. According to McQuinn and Whelan (2008), the long-run steady-state growth rate of output per hour in the Euro Area equals  $g/(1 - \alpha)$ . If one assumes a trend growth rate of  $g = 0.2$  and a  $\alpha$  of 0.3, long-run output growth per hour worked will be 0.3 percentage points per year.

Even though labour force participation rates can be further increased, e.g. by integrating more women in formal employment, overall hours worked tend to decrease.<sup>14</sup> Combined with demographic effects which tend to shrink the labour force significantly in the next decades, it seems intuitive that contribution to output from hours worked will probably decrease overall. These observations are in line with McQuinn and Whelan (2016) who estimate that total hours worked will decrease by more than 10 percent till 2060.

<sup>13</sup> Often denoted as total factor productivity (TFP) which measures changes in GDP with regard to aggregate input factors. TFP could in a simplified way also be seen as the share of growth which cannot be explained by labour and capital inputs.

<sup>14</sup> This effect can be intensified by more part-time workers which increase participation statistics but decrease working hours numbers.





Table 1<sup>15</sup> shows average GDP accounting numbers for the pre-crisis and the post-crisis period for EU-28 and Euro Area-11 countries, respectively. One can observe a clear slowdown for Euro Area countries, which is mainly due to lower total factor productivity and capital contribution. With regard to EU-28 countries, the convergence of mainly eastern European member states has offset the decline in GDP on aggregate. However, what is visible as well is a clear slowdown in capital contribution. In order to have comprehensive output projections, one can try to look at the single factors separately. Obviously, demographic shifts will reduce the contribution of labour quantity to GDP growth and might even have a negative impact.

Productivity might also be affected by ageing societies, because of slower adaptation to new technology, lower worker mobility or declining physical health. Productivity levels, while even increasing due to a catch-up effect in new member states, have lowered in Euro Area countries in the past decade. Nevertheless, it seems reasonable to not assume a further decline and expect a similar rate in the future. Gordon (2014) argues that there is no evidence for slower technological change<sup>16</sup>, McQuinn and Whelan (2016) also expect TFP to continue with the average 2000–2013 growth of 0.2 percent in the Euro Area. The lower TFP in Europe has its roots in two main underlying sources. The first is low investment rates which hampers the amount of capital available per worker and the second the poor diffusion of technology from the frontier to other firms.<sup>17</sup> This can be seen at the decrease in capital as a growth contributing factor too. In addition, the strong presence of consumer-driven sectors where a high share of growth is concentrated in labour-intensive growth sectors and ongoing credit constraints in response to the crisis do also contribute to this weakness. Against this background, capital is projected to be at the post-crisis level also in the next decades.

Long-term projections from the OECD (see Guillemette and Turner 2018) assume rising productivity till 2060 which more than offsets the lower share of active population. According to their estimations, labour efficiency<sup>18</sup> will be more than double compared to the last 20 years. Against this background, trend output in advanced economies seems to remain broadly stable, with per capita potential output even increasing. Guillemette and Turner (2018) estimate real GDP per capita growing by 1.1. percent in the Euro Area from 2018 to 2030 and by 1.7 percent from 2030 to 2060.

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<sup>15</sup> Data series from “conference-board.org” contains time series data on the contributions of factor inputs—labour (labour quantity and labour quality), capital (non-ICT capital services and ICT capital services) and total factor productivity growth (TFPG)—to GDP growth, obtained using a growth accounting method based on 2-year averages.

<sup>16</sup> He shows that TFP has been quite stable in the USA in the past century apart from the “economic miracle” between 1930 and 1970. Instead of a productivity slowdown in recent decades, these years of extraordinary growth were an exception.

<sup>17</sup> Lectio magistralis by the ECB president Mario Draghi, 30. November 2016, Madrid.

<sup>18</sup> Which can be seen as a combination of TFP and labour quality and is estimated in a conditional convergence framework. In steady state, the equilibrium level of labour efficiency depends on the institutional and policy environment and converges to an exogenous rate of global technological progress which is assumed to be 1 1/2 percent.



**Table 1** GDP growth accounting

Period	GDP	Labour quantity	Labour quality	Capital	TFP
EU-28					
1990–2007	2.4	0	0.2	1.7	0.5
2012–2018	2.5	0.5	0.2	1.1	0.6
EA-11					
1990–2007	2.7	0.5	0.2	1.7	0.4
2012–2018	1.7	0.5	0.2	0.9	0.1

Average values on the decomposition of GDP growth for different time spans based on “conference-board.org”

Table 2 shows different long-term estimates on real GDP growth in Euro Area countries and the EU as a whole [compare Carone et al. (2006), Fouré et al. (2012), Hawksworth et al. (2017) and Johansson et al. (2013)]. Growth rates in the next 30 years are expected to be in a range between around 1.3 percent and 1.9 percent growth per year. The latest IMF World Economic Outlook (WEO) from June 2019 estimates potential output to 1.4 and 1.6 in the Euro Area and EU-28, respectively. In general, growth in Euro Area countries tends to be a bit lower than in the EU-28.

## Inflation

A third important component in debt dynamics equation is price developments. In general, a government issues bonds in order to finance a deficit in year  $t$ . In the following years, it pays an interest to investors, which refers to the face value of the bond, over a certain period till the bonds matures. However, if inflation ( $\pi$ ) is  $> 0$  the amount in year  $t$  is worth less than in year  $t_{+1}$ . As  $\pi$  reduces the value of money, a government benefits *ceteris paribus* from rising prices through a constant devaluation of its debt if  $\pi > 0$  for the period  $t$  to  $t_m$ . When it comes to the debt-to-GDP ratio  $\pi$  does affect both components since GDP is measured in real terms.

One obvious and easy possibility to model inflation in the long run is to rely on the ECB legal mandate, which states the objective of Euro Area monetary policy is price stability at below but close to 2 percent. Therefore, it might be intuitive to believe in the ECB reaching its objective. Longer-term inflation forecasts from the ECB have seen inflation at the objective of close to 2 percent since the Euros implementation.<sup>19</sup>

More sophisticated approaches rely on economic models which aim to study medium and long-term dynamics of inflation. According to Kamber and Wong (2018), inflation is determined domestically in the long run, even though foreign

<sup>19</sup> Longer-term forecasts estimate the expected harmonised index of consumer prices (HICP) rate five years ahead. Source: ECB.



**Table 2** Expected growth rates of real output

GDP growth p. a.	2021–2050%	2021–2030%	2030–2050
EA	1.4–1.7	1.4–1.9	1.3–1.6
EU-28	1.5–1.8	1.5–2.2	1.2–1.7

Assumptions on GDP growth based on Carone et al. (2006), Fouré et al. (2012) and Hawksworth et al. (2017), the IMF or Johansson et al. (2013)

shocks matter for short-term movements. However, these short-term fluctuations are very dependent on oil and food prices and on the business cycle, respectively. Hence, the longer the forecast horizon, the more actual inflation depends on inflation expectations. A well-believed inflation target based on a sound and comprehensive monetary policy framework therefore provides a credible inflation estimate.

## Methodology and Econometric Model

As elaborated before, the key relationship for public debt dynamics is the difference between the interest paid on government debt and economic growth. Hence, the empirical analysis focuses on the estimation of the long-term interest rate and uses existing forecasts on long-term output growth rates. From an empirical point of view, this differential has been positive (e.g.  $r - g > 0$ ) for most advanced economies most of the time (Checherita-Westphal et al. (2019)). However, recently the differential has reversed into negative territory in most high-income economies, including the Euro Area. The IRGD was favourable in 2017 for all EU countries except Italy and Denmark (see Fig. 2). Thus, a debate on whether this stance is not just temporary but persistent came up among academics.<sup>20</sup> In order to answer this question, it is key to investigate the difference between the (neutral) interest rate and (potential) output growth.

It is important to note that the actual interest paid matters for the IRGD, which is different from long-term interest rates on issued debt. The following equations are based on Guillemette and Turner (2017) and show the calculation of the interest rate payments. Nominal interest payments  $i_{nt}$  depend on the implicit average interest rate on outstanding debt,  $rp_t$ , and the stock of government debt.

$$i_{nt} = \frac{rp_t}{100} * D_{t-1} \quad (3)$$

In the second step, one can compute the effective implicit interest rate over the projection period.  $rp_t$  at time  $t$  adjusts gradually to the long-run interest rate  $i_t$  as some government bonds mature and new debt is issued.  $RFSH_t$  represents the ratio of

<sup>20</sup> Olivier Blanchard discussed the role of fiscal policy with a persistent negative differential in his 2019 AEA Presidential address. Blanchard (2019).



issuance to the outstanding stock of debt. The higher this share, the faster the adjustment towards the current market rates.

$$rp_t = (1 - RFSH_t) * \frac{i_{nt-1}}{D_{t-2}} + RFSH_t * i_{it}. \quad (4)$$

## Methodology

Since long-term forecasts entail a lot of uncertainty, I use three different scenarios to project the future IRGD. I examine two scenarios which use data from major economic institutions, the European Commission and the OECD. In addition I create another scenario—“baseline model”—which builds on a more structural approach of interest rate forecasting. The “baseline” model can be compared to existing projections. This comparison yields several advantages: first, a comparison of three different scenarios can also be seen as a robustness check and thus check the plausibility of the results and the overall hypothesis of this paper, and second, if major differences emerge, one can look at the specific determinants of those discrepancies and discuss them. All models use annual data on GDP growth, inflation and interest rates to calculate the interest rate-growth differential and assess the future fiscal space. Actual data observations are used in the time span 1980 to 2018; from 2019 onwards I use the institutions’ estimations (where available) and compute the point forecasts based on the described methodology in the baseline model, respectively.

In the “baseline model”, interest rates are based on several structural variables. The signs and coefficients of these determinants are computed using a panel regression with country-fixed effects. The panel consists of the Euro Area-12 countries.<sup>21</sup> The effective interest rate paid is calculated by using Equation 3 and 4 to adjust the actual interest rate by the long-term interest rate paid on new issued debt.<sup>22</sup> GDP is not estimated directly through the model as there already exist many long-term projections which are quite similar in size (see “Output Growth” section). Thus, for GDP projections I use the long-term growth forecasts from the 2019 IMF World Economic Outlook up to 2024 and thereafter perpetuate these values.<sup>23</sup> The projected potential growth rates are in line with most long-term estimations on economic growth, as described in “Interest Rate Model” section.

European Commission estimation data come from the Commission Database AMECO up to the year 2021 and Long-term Medium-Term Objective (MTO) forecasts foreseen in the Stability and Growth Pact. Numbers are taken from 2019 estimations computed in the Fiscal Sustainability Report. Primary balance estimations are used from the latest Fiscal Sustainability Report (Commission 2019); nominal

<sup>21</sup> Because of data availability, the panel should give indications for the overall interest rate development which also affects the whole EU-28.

<sup>22</sup> Data on issuance come from the ECB statistical warehouse on debt securities issuance and service by EU governments. <https://sdw.ecb.europa.eu/reports.do?node=1000004059>.

<sup>23</sup> For 2020 and 2021, I also use GDP forecasts stemming from the EU Commission.



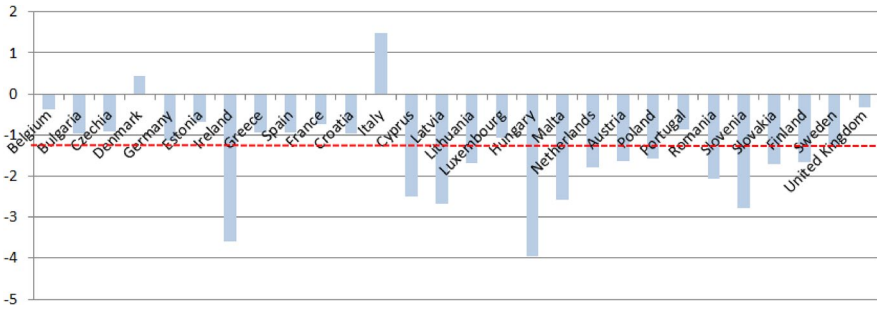


Fig. 2 Interest rate-growth differential 2018 EU countries (Data: AMECO 2019)

growth rates and interest rates, respectively, are used from long-term medium-term objective projections.

Finally, the OECD scenario uses data from the OECD long-term outlook to calculate the future IRGD and apply debt projections (Johansson et al. 2013). Data come from the OECD Long-Term Economic Outlook Database (2018), and the interest rate payments are calculated as the difference of net lending and primary balance. Data till 2021 are used in GDP forecasts; afterwards I use estimates of potential GDP. In order to be able to compare data between the three methodologies, I adjust the OECD financial liabilities variable to the Maastricht debt definition.<sup>24</sup>

### Interest Rate Model

The estimations of long-term interest rates are based on the “Loanable Funds Model” (LFM) which describes the joint determination of savings and investment by capital demand and capital supply. Therefore, I follow Demary and Voigtländer (2018) and Rachel et al. (2017) and use several variables justified by economic theory. The estimations are based on a panel regression analysis using country-fixed effects.

$$Y_{it} = \beta_1 X_{it} + \alpha_i + u_{it} \quad (5)$$

$\alpha_i$  ( $i = 1 \dots n$ ) is the vector of country-fixed effects;  $X_t$  is the explanatory vector which consists of different variables which are used as determinants for capital demand and supply such as GDP growth, debt variables, different demographic variables, inequality and dummy variables. There arises a possible endogeneity issue since interest rates also affect economic growth. However, when it comes to the impact of the interest rate level on potential growth, the long-run effect is quite small. In order to rule out potential problems, the regression is estimated with alternative specifications, such as using potential GDP growth instead of actual output growth or with lagged values. Furthermore, a Hausman specification test is applied to test

<sup>24</sup> This is done by taking the difference between historical debt levels and financial liabilities and adjusting the OECD forecast by this factor.



the consistency of random vs. fixed effects. The results indicate a clear preference for fixed effects. Overall, the applied econometric tests conclude that the mentioned issues do not pose a serious concern to the interest rate estimation. Hence, I stick to the fixed-effects panel regression approach because it gives the most econometric value. In order to better understand the drivers on interest rates, separate estimations on interest rates and growth rates yield more explanatory value for economic policy. Since there already exist many long-term forecasts on the development of potential output, I use the existing assumptions for my forecasts and the regression model focuses on interest rates only.<sup>25</sup>

As a measure of the economic stance, I use GDP growth. Theory would suggest that higher GDP implies higher interest rate; thus, the indicated results are in line with what one would expect. In order to include financial soundness in the model, I add two debt related variables, one, which depicts the change of the debt-to-GDP ratio, and another variable, which shows the difference of the overall ratio to the 60 percent Maastricht criterion. This threshold is of particular importance in the EU and more important for investors than the overall level of debt. Furthermore, the model includes several demographic variables that have a major explanatory value for the decline in interest rates—*Old-age dependency ratio*, *life expectancy* and the *share of 40–59 age*. I also include inequality in the model. Since simulations with proxies of corporate inequality (such as corporate profits, etc.) are of poor data quality, I have only included income inequality, measured as Gini coefficient. For government bonds, it is not only national inequality which matters.<sup>26</sup> Thus, I use country group inequality.<sup>27</sup> Finally, the model includes the Current Account balance and two proxies for the 2009 financial market crisis and the unconventional monetary policy of the ECB since 2014, respectively.

## Regression Results

Next, the underlying econometric results are presented. In order to compute the determinants of long-term interest rates, I use a country-fixed effects panel data regression including cross-sectional weights. The regressions include several variable combinations, based on theory guidance and existing research.<sup>28</sup> or Ichiue et al. (2012) Overall, the model fits well according to the adjusted R2 value and all variables in the model are highly significant (Tables 3, 4).

The detailed results give indications on the drivers of the interest rate levels. Overall, most coefficients and signs are in line with the expectations described in

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<sup>25</sup> Some papers, e.g. Johansson et al. (2013), use the IRGD as dependent variable in their model. This approach has the advantage to overcome possible endogeneity problems. On the other hand, the economic policy value is limited since both economic growth and interest rates have different determinants.

<sup>26</sup> Due to free capital movements in the EU and the high demand of foreign investors which also determines the savings demand balance of the bond markets.

<sup>27</sup> Data from the World Inequality Database—Blanchet et al. (2019).

<sup>28</sup> When using fixed effects estimators, I assume country-specific characteristics apart from the explanatory variables that impact or bias the interest rate level. This approach seems reasonable for this case, e.g. compare Borio et al. (2017).



Sect. 2. First, higher economic growth is associated with higher interest rates. That also means that lower expected potential growth in the future will contribute to lower interest rates compared to the past decades. Both debt variables the increase in debt and the difference to the EU 60 percent threshold, respectively, lead to a higher interest rate. These coefficients are also in line with theory. On the other hand, demographic proxies show a mixed impact on the interest rate. A society with a higher old-age dependency ratio and a larger population group of people aged 40 to 59 will lead to lower interest rates while higher life expectancy increases the number of years in retirement and thus increases the number of “net consumers”. The results are in line with theoretical assumptions—an ageing population leads to higher savings because people at the end of their career save more, while a higher life expectancy includes more people which are net consumers over their life cycle. The panel regression also shows a downward effect of inequality on interest rates. There exist several potential transmission channels. First, the more income is concentrated among fewer individuals, the more is saved in the whole economy. Second, especially wealthy people tend to have more private retirement schemes and securities structured in funds. This may increase demand towards safe assets in advanced economies. The positive sign of the current account seems not what one expects. However, the effect on interest rates is quite small (an improvement in the current account balance of around five percent would, *ceterisparibus*, lead to upward pressure on interest rates of only 65 bp.), and a possible explanation may be that persistent current account surpluses in Euro area countries may lead to expectations of an appreciation of the real exchange rate. In an international market, this necessitates a risk premium on rates to attract investors (see Orr et al. 1995). The two proxies in the regression model which depict the 2009 financial market hysteresis and the ECB unconventional monetary policy, respectively, also show the expected sign. The financial market contagion has sharply increased interest rates in 2009 while the onholding expansive ECB monetary policy has a significantly negative effect. According to the results, the ECB policy has a negative effect on interest rates of about 1 percentage points. This observations is quite useful as it also allows to differ the structural drivers from the exogenous monetary policy influence. Thus, interest rate projections could be adapted depending on how long the ECB conducts its expansive policy tools.

As a robustness check, I have also estimated models including further variables. However, the results do not change significantly. These estimations include a proxy of savings in emerging markets (the results have high explanatory value in the mid 2000s<sup>29</sup> but EU current account surpluses stepped in as the major imbalance on a global scale since then), total factor productivity (which is already represented in GDP growth) and other demographic variables (young-age dependency ratio). Further robustness checks on stationarity, heteroskedasticity and cointegration yield quite robust results for the used model.<sup>30</sup>

<sup>29</sup> See global savings glut hypothesis.

<sup>30</sup> All variables apart from the debt difference to the 60 percent threshold and the group aged 40–59 significantly reject the null hypothesis of an unit root according to the Breitung t-statistic. The Johansen test



**Table 3** Panel estimation: determinants of interest rate-dependent variable: real interest rates

Variable	Model 1
C	11.01** (4.32)
GDP growth	0.27*** (0.04)
Debt diff.	0.10*** (0.02)
Debt 60 percent	0.06*** (0.007)
Old-age dependency ratio	- 0.33*** (0.04)
Life expectancy	0.36 ** (0.09)
Age 40–59	- 0.69*** (0.06)
Inequality	- 0.39 *** (0.09)
CA	0.13 *** (0.09)
Proxy unconventional MP	- 0.95 *** (0.27)
Proxy 2009	3.13 *** (0.47)
<i>N</i>	456
<i>R</i> <sup>2</sup>	0.74

\* $p < 0.1$  \*\* $p < 0.5$  \*\*\* $p < 0.01$

A major caveat of the econometric framework is that the explanatory variables and their signs or coefficients could change in the future while the approach presented in this paper assumes stable relationships. Furthermore, the results are prone to high uncertainty stemming from demographic projections. Migration waves may change the demographic structure of a country significantly and therefore also the respective effect on interest rates. Finally, the higher the extend of monetary policy actions, the harder it is to estimate interest rates structurally. The vast asset purchasing programmes in the past years have lead to “artificial” pressure on interest rates beside structural factors and that needs to be taken into account. The proxy variable in the regression model aims to catch this factor, but the longer this monetary policy tools are in effect, the higher the danger that important influences on the interest rate are missed. An alternative is the estimation of “natural” interest rates [compare

Footnote 30 (continued)

on cointegration and heteroskedasticity tests also perform well. More detailed results are available upon request.





Laubach and Williams (2003)]. This approach has a high value in economic research and theory but only limited value for applied economic policy, though.

The results of the regression are used to forecast long-term real interest rates. By adjusting to (expected) inflation, I use projection on the future interest rates governments have to pay on their bonds. The convergence of nominal long-term bonds to implicit is computed by using data from the ECB on bond issuance. The model fits quite well compared to ex post data up to 2018. For most countries, the short-term forecasting performance is very good too (compare Fig. 11). For France and Italy, the short-term projections assume a bit too high values—thus, I use the latest ECB macroeconomic forecasts to adjust long-term bond yields for 2019 and 2020 (see Eq. 4).

## Projections

The constructed long-run projections are depicted in Fig. 3. The drop in GDP amid the COVID-19 pandemic leads to highly positive IRGD in 2020, but strong catch-up growth afterwards should lead to a reversal to a highly negative IRGD in 2021. In the next years, the results indicate a substantially lower structural interest rate level and lower potential GDP than in the past decades. However, since the decline in interest rates is stronger than in GDP, the IRGD is expected to remain quite low, even though country-specific results differ. The IRGD is projected to remain in substantial negative territory throughout the next decades in “core” and “periphery” countries.<sup>31</sup> Italy is a notable exception, mainly due to assumptions on lower potential growth over the next decade. So, this analysis yields evidence that most EA-12 countries will experience a prolonged period with a more favourable environment for public debt.

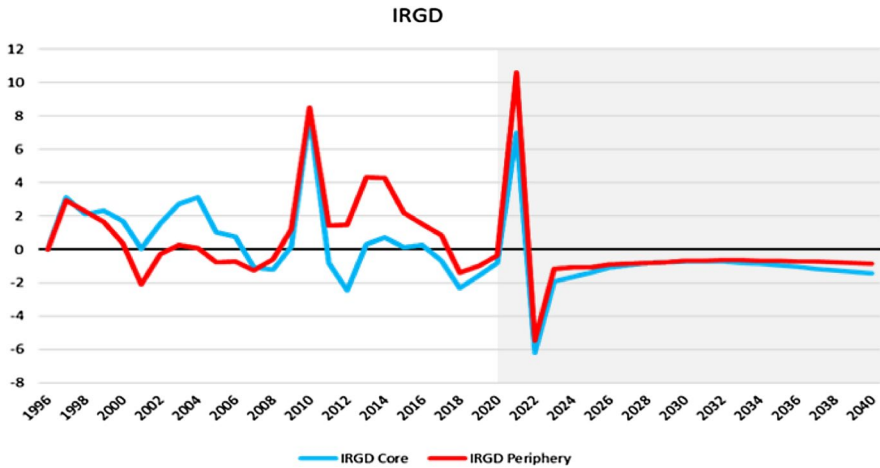
Figure 4 shows point estimations of the average IRGD from 2001 to 2017 (green dots), in 2018 (blue dots) and in 2030 (red dots and light blue dots,<sup>32</sup>), respectively. The x-axis depicts nominal GDP growth and the y-axis the implicit interest rate on government debt. The right-hand graph compares 2001–2017 averages (green dots) to estimations based on the regression analysis (orange dots). The 45° line represents a zero IRGD; points below the line indicate a negative differential and vice versa. One can clearly see that the dots shifted downwards and were mostly negative in 2018. More importantly, IRGDs seem to remain negative in most countries even in 2030.

The results show a favourable environment for public finances in the medium and long run. Even though the cost of public debt decreases, it does not fully disappear. Thus, the additional fiscal space should be used wisely for structural reforms and investment over the long run (see “Using the Fiscal Space” section). Even though there is an expected favourable environment on aggregate, country-specific results are very different. Table 5 shows average values for GDP growth, the interest rate

<sup>31</sup> France is also seen as core country in this case.

<sup>32</sup> Red dots are based on OECD estimations and light blue dots on EC estimations.





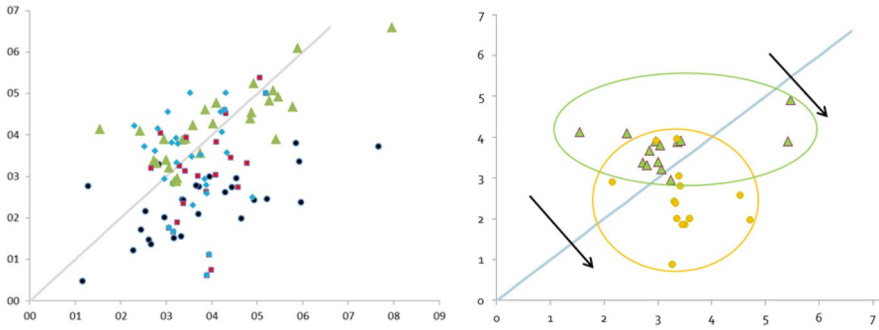
**Fig. 3** Projections from baseline calculations in percent of GDP. The shaded area depicts forecasts.—Core countries cover AT, BE, DE, FI, FR, NL, and LU; periphery covers IT, ES, PT, IE, EL. Shaded area indicates projections. GDP values are based on IMF WEO data, implicit interest rate based on AMECO and own calculations—GDP weighted)

and the IRGD, respectively, for the different estimations scenarios. While all projections assume negative IRGDs for almost all countries on average for 2018 to 2030, there are a few outliers. As already mentioned previously, Italy cannot participate from this environment and shows a positive IRGD in all scenarios. In particular, very low potential growth puts upward pressure on the IRGD in Italy. Thus, further reforms are needed to boost potential growth and increase fiscal sustainability.

### Differences to EC and OECD Estimations

The baseline computations reveal substantial differences of the future IRGD in the long run in the baseline estimations and the EC and OECD projections. The European Commission forecasts the medium and long-term development of macroeconomic key variables in its Fiscal Sustainability Report (with a horizon of  $t_{+10}$ ) and its Ageing Report (Commission 2018). The baseline model in this paper was also motivated by the fact that EC estimations assume relatively high interest rates in the future. In the long run, the Ageing Report projection assumes a steady-state real interest rate at 3 percent (5 percent nominal). However, it is highly questionable whether interest rates will converge to this level. Furthermore, medium-term estimations from the Commission are still below the steady state for most countries till 2030. In the Commissions projections for 2030, the IRGD is on average 0.5 percent lower, e.g. more favourable for debt reduction, than in the average to the past two decades. Furthermore, past projections of the Commission have repeatedly overestimated the convergence (Appendix: Figs. 8, 9, 10). Several papers have estimated the real equilibrium interest rate to be significantly lower than in the past, at or below 1





**Fig. 4** Interest rate and GDP growth in different years (avg. IRGD (2001–2017) and point estimates based on OECD and EC estimations on the left-hand side and baseline model for EA-12 on the right-hand side )

percent.<sup>33</sup> This would indicate a negative IRGD as long as real GDP growth is above 1 percent,<sup>34</sup> which is in line with most long-term projections.

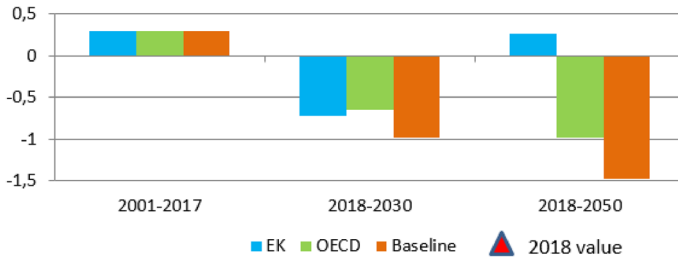
These differences are visible in Figure 5 which displays average IRGDs in three different periods, from 2001 to 2017, from 2018 to 2030 and from 2018 to 2050.<sup>35</sup> While IRGD was positive on average in the past 16 years, the situation changes substantially for the next decade. An even longer projection period up to 2050 indicates a upward pressure on the IRGD; it still is expected to be lower than in the past, however. The difference from the baseline model and EC and OECD estimations lies on the econometric techniques. While the further use models which converge to a “steady-state” equilibrium interest rate, the baseline model is purely empirical driven. Hence, changes in variables (e.g. an onholding ageing population) may continue with downward pressure on interest rates. Longer-term projections up to 2050 show a reversed picture because both EC and OECD estimations assume high equilibrium interest rates (see Fig. 10 in Appendix). However, it is questionable whether the assumptions on rising interest rate will materialise. Many countries have issued high maturity debt at interest rates much lower than their actual payments. Therefore, there should be downward pressure on the implicit cost of debt in the next years. The longer interest rates stay low, the higher the fall of implicit debt costs. The quick reversal in financing costs in Fig. 10 points to expectations of increasing interest rates within the next two years. Nevertheless, the projections overall support the hypothesis that the IRGD is favourable, at least in the next decade. The indicated results are also in line with long-term estimations from the USA. As shown in Fig. 12, the difference of the estimated real rate is assumed to be pretty stable in the baseline estimations.

<sup>33</sup> Compare Rachel et al. (2017), Summers (2019), John Williams (<https://voxeu.org/article/evidence-low-real-rates-will-persist>) or OECD (<https://www.afr.com/markets/low-interest-rates-here-to-stay-says-oecd-director-adrian-blundell-wignall-20150728-gim62a>).

<sup>34</sup> Assuming a long-term inflation rate of 2 percent.

<sup>35</sup> Comparisons cover an unweighted average of EA-12 member states. OECD observations exclude countries where no data was available.





**Fig. 5** IRGD for three periods (averages based on unweighted averages of EA-12 countries for the baseline model, OECD and EC estimations)

**Table 4** Did Countries with fiscal space use it? Source: Investment is measured as public gross capital formation relative to GDP

	2000–2008			2013–2019			Delta	
	Investment	Net lending	IRGD	Investment	Net lending	IRGD	Investment	IRGD
Germany	2.1	– 2.1	1.3	2.2	0.8	– 1.1	<b>0.1</b>	<b>2.4</b>
Euro Area	3.2	– 2.0	0.5	2.7	– 1.7	– 0.2	<b>– 0.5</b>	<b>0.8</b>
Netherlands	3.9	– 0.7	0.0	3.5	– 0.4	– 0.6	<b>– 0.4</b>	<b>0.7</b>
France	3.9	– 2.8	0.4	3.5	– 3.4	– 0.1	<b>– 0.4</b>	<b>0.5</b>
Italy	3.0	– 3.0	1.4	2.3	– 2.6	2.4	<b>– 0.7</b>	<b>– 1.0</b>
Spain	4.2	– 0.2	– 1.2	2.2	– 4.4	0.3	<b>– 2.0</b>	<b>– 1.4</b>

Own calculations based on Eurostat and EC

### Impact of COVID-19 on IRGD

An important point to note is that the results do only describe the structural developments and do largely ignore business cycle movements which affect primary deficits. This is observable in the current COVID-19 pandemic. The pandemic and the entailed lockdown measures have probably triggered the worst economic recession in this century. Governments all over the world have announced enormous fiscal stimulus programmes to support the economy. Even though this paper addresses a more structural development, the impact of COVID-19 cannot be ignored. The huge drop in output in 2020 leads, *ceterisparibus*, to a deterioration of the IRGD from the GDP side. The impact on interest rates so far is negligible, however. Thus, the longer-term projections presented in this paper should not change due to the pandemic. This stems from the fact that current forecasts (up to May 2020)<sup>36</sup> assume a V- or U-shaped recovery, i.e. a huge drop of GDP in 2020 and a substantial rebound in 2021. At the same time, interest rates in the Euro area have only reacted marginally, also due to expanded ECB asset purchasing programmes. Some papers (compare Jordà et al. 2020) argue that interest rates may stay low because of the

<sup>36</sup> Some calculations take data from the European Commission Spring Forecast 2020 into account.



pandemic. Therefore, the overall effect on the average IRGD for a long period of one or two decades is quite small. The effect of the crisis on the interest rate seems also negligible if one uses the coefficients of the econometric model. While in 2020 substantially higher debt levels lead to upward pressure on interest rate levels, this effect is nearly completely offset by downward pressure through lower GDP growth and a lower CA surplus. In 2021, the upward pressure effect may dominate if GDP growth is assumed to bounce back significantly while debt reduction takes place more slowly. If the crisis reveals a more L-shaped development, growth may stay below potential for several years and interest rates could rise in response to continuing expenditure pressure which could lead to a situation where the IRGD stays in positive territory for longer.

## Using the Fiscal Space

The forecast analysis of the main fundamental factors of public finance suggests that there exists additional room for fiscal policy actions. However, at the same time there arise new fiscal challenges such as increasing ageing related expenditures, due to higher health-care and pension expenditures, changes in the tax structure and the large stock of public debt as a legacy of the Euro Crisis. These are issues which need to be kept in mind. Nevertheless, this paper focuses on the changing macroeconomic environment and its fiscal implications. Therefore, the following chapter gives some short insights on fiscal policy shortfalls in the EU and provides suggestions on how to best use this space from a macroeconomic perspective while continue on the debt reduction path. The additional fiscal space needs to be used wisely in order to keep public finances sustainable and resistant against macroeconomic downturns. Hence, the main focus is laid on two pillars. First, I will argue that the favourable IRGD should be used to tackle the (public) investment gap in the EU. Future-oriented investments represent growth friendly expenditures which will provide, adequately set, positive future returns and positive effects on trend growth and debt reduction. Second, lower interest rates require a rethinking of the interaction between monetary policy and fiscal policy, in particular, during economic downturns. If real interest rates remain low, perhaps even negative, room for manoeuvre for monetary policy as a stabilising tool is limited and fiscal policy efforts are needed.

## Public Investment in the EU

In the aftermath of the crisis, both public and private investments have fallen. Persistent low levels of investment may lead to a deterioration of capital and hamper long-term growth potential. However, developments are very heterogeneous across EU member states. While public investment has increased in the new member states<sup>37</sup> in recent years, it lost ground in most western European countries and has not

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<sup>37</sup> Cohesion funds from the EU budget have contributed significantly to a rise in public investment in countries like Latvia, Poland, Romania or Bulgaria after they joined the EU.



recovered since then. Public investment as a percentage of GDP is still significantly below the level of 1995 in the Euro Area. Rising spending in “modern” investments like R & D or intellectual property could not offset the decline. The still persistent gap of public investment in a time of low borrowing costs and low potential growth has prompted calls for more stimulation. Data reveals that countries with the most fiscal space in recent decades did not use it properly to address public investment needs. The IRGD in the Euro area has improved by 0.8 percentage points and turned into negative territory in the post-crisis period compared to the 2000–2008 period. At the same time, public investment declined by 0.5 percentage points which reveals some “unused” potential of future-oriented investments. This “potential” has been even higher in Germany where public investment raise by a mere 0.1 percent while the average budget deficit became positive and the IRGD turned much more favourable. On the other hand, southern European countries like Italy or Spain experienced a deteriorating IRGD, higher net lending and reduced public investment. Thus, it can be concluded that several EU member states have lacked using the additional fiscal space to fuel public investment.

So far, several measures on EU level have been implemented to combat this investment gap; most famous is the “Investment Plan for Europe”<sup>38</sup> which aimed at unlocking public and private investment amounting to over 300 bn Euro over the period 2015–2017. Furthermore, the Stability and Growth Pact<sup>39</sup> contains fiscal flexibility clauses with regard to investment and structural reforms. Recently, discussions on a “Euro Zone Budget” touched upon the issue of low public investment as well. Against this background, in December 2018 EU leaders agreed on a Budgetary Instrument for Convergence and Competitiveness (BICC) which aims to foster public investment within the Euro Zone and ERM-II Member States.

Research by the OECD (2016) supports the view that the low interest environment offers extremely favourable borrowing conditions which should be used to increase productive public spending. Mourougane et al. (2016) argue that there is fiscal room for deficit-financed public investment stimulus of around half percentage point of GDP on average in OECD countries. Investment multipliers tend to be highest where the initial level of public capital is low. Figure 6 shows the estimated effect of public investment on potential GDP depending on the level of public capital stock as a share of potential GDP. One can clearly see that most EU countries have ample space for increasing their stock of public capital. Therefore, EU countries may expect substantial positive effects of higher public investment expenditures as well. In general, if public investment is debt financed, its long-term effects on debt-to-GDP ratio depend on the difference between the return of the investment  $r$  and the interest paid by the government for this additional deficit, denoted in  $i$ .<sup>40</sup>

<sup>38</sup> Also known as “Juncker Plan”.

<sup>39</sup> The flexibility under the preventive arm of the Pact is given by clauses which provide fiscal allowances corresponding to the short-term budgetary impact of investments and structural reforms. However, there are a number of conditions which have to be met, such as that the use of the clauses should not lead to a breach of the three percent deficit threshold and it can only be use in bad economic times.

<sup>40</sup> Note: the government can choose whether it finances the investment via additional debt or by reducing current spending (or increasing revenues). Financed by the latter, it leaves public debt constant while increasing (potential) output. As a result, debt-to-GDP ratio is lower. If the government borrows



Long-term output gains following a permanent rise in public investment of a half percentage point of GDP are assumed to be pretty high. OECD calculations vary between around 0.5 and 2.5 percent difference to the baseline scenario. In fact, output gains are even higher at the zero lower bound. Estimations from the Bank (2016), indicate an debt-financed investment multiplier<sup>41</sup> of around 1.5 percent in the first two years and 1.8 percent in year 10. In the short run, such a public investment shock increasing domestic demand has even positive effects on the public debt-to-GDP ratio (it falls by around 0.25 percent). Even though simulations show that after ten years the government debt ratio slightly increases (just around 0.2 percent), the results underline the effectiveness of higher public investment and its budgetary sustainability, respectively.

There exists urgent need for substantial public investment in Research and Development, infrastructure, dwellings and climate-related investments (which, of course, are also connected to the former areas). The European Commission estimates that the EU will need about Euro 180 bn or about one percentage point in additional (public and private) investment each year in order to meet the Paris Agreement commitments. Against this background, the favourable macroeconomic environment should be used to tackle these challenges. Amid the recent COVID-19 pandemic, calls for economic recovery plans have also gained ground. This situation could yield a window of opportunity to stimulate the economy and contribute to the green transition with dedicated public investment programmes.

This analysis ignores interaction effects of higher investment on interest rates. If a country spends an additional 0.5 percentage points of GDP on public investments, it reduces the savings—investment overhang which may in turn lead to upward pressure on interest rates. On the other hand, it increases GDP growth, e.g. with regard to the IRGD, it is unlikely that the interest rate effect of half percentage point investment increase offsets the investment multiplier. As we have seen before, investment multipliers tend to be higher the larger the existing gap. Therefore, additional spending on public investment presumably widens the differential, e.g. reduces debt-to-GDP ratio even further. Further research is needed to quantify these effects. Furthermore, there is literature on the growing importance of intangible capital investment which is often missed in the analysis of investment gaps. Research from Crouzet and Eberly (2019) shows that the investment gap is highly correlated with the share of intangibles in total capital in the USA. Against this background, calls for higher government spending due to falling investment may overestimate the problem and thus face problems related to crowding out.

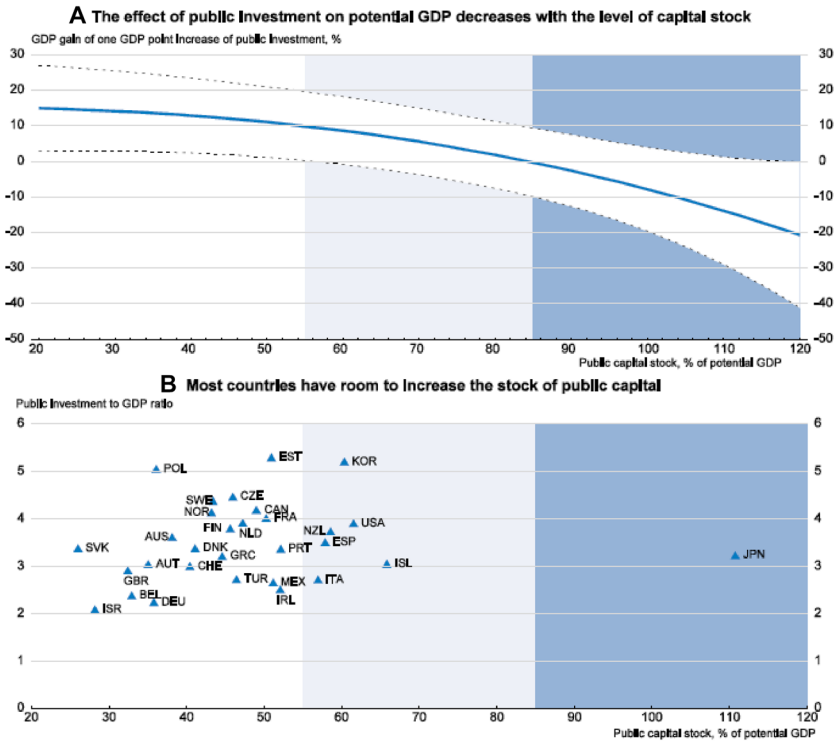
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Footnote 40 (continued)

the money to finance the investment for a number of years, the two effects—increase in debt which is to some extent offset by higher output due to the investment—will work in the opposite direction. The break-even number of years depends on the quality of investment project and the multiplier effect.

<sup>41</sup> In their model, they apply an investment shock of 1 percent of GDP. In order to compare it to our model, we assume a half percentage point investment increase instead. Public investment is assumed to increase by 0.5 percent over 5 years and thereafter gradually returns to the baseline level.





Note: The dashed line indicates the 95 % confidence interval. The measure of the capital stock depends on assumptions on the rate of depreciation of capital and on the level of disaggregation at which the calculation is made. The IMF database of public stock series, which may differ from national sources, has been used to compute these estimates. This database is used here because the capital stock is computed in all countries with the same methodology. Light shading indicates a positive not significant investment effect and darker shading indicates a negative not significant investment effect.

Fig. 6 Estimated returns of public investment (Mourougane et al. 2016)

### Fiscal Policy as a Stabilising Tool

As explained in the previous chapters, interest rates have fallen substantially and there are many signs that they will remain persistently lower than in the past decades. This opens opportunities for fiscal policy, since the IRGD tends to be negative. At the same time, it limits the effectiveness of monetary policy. Transmission channels of expansive monetary policy have already lost ground in the last years. There are no signs of overheating—inflation remains below target the Euro Area and Japan, and market expectations, based on 30-year forecasts, are for less than 2 percent in the USA. Therefore, fiscal policy needs to step in and play a bigger role. Monetary policy close to the zero lower bound usually even amplifies the size of fiscal multipliers<sup>42</sup> which means an larger stabilising effect in crisis times.

<sup>42</sup> There exists wide literature on fiscal multipliers. For an overview see Batini et al. (2014).





Beside the BICC which aims to foster investments and convergence in the medium term in June 2018, the European Commission also proposed an Investment Stabilisation Function (EISF).<sup>43</sup> The EISF shall provide funds for countries hit by an asymmetric shock.<sup>44</sup> The fund would have an overall ceiling for lending backed by the EU budget of 30 bn Euro. The IMF (Arnold et al. (2018)) also proposed a central fiscal stabilisation capacity (CFC) for the euro area. In their proposal, countries contribute to a “rainy-day” fund in good economic times in order to build buffers which can be used to smooth macroeconomic shocks during economic downturns. If countries contribute 0.35 percent of GDP per year, the stabilisation capacity could build up assets of about 2 percent of euro area GDP in good economic environment. In the case of a shock, the fund would provide considerable stabilisation. Estimations from the IMF estimate that the CFC would reduce the impact of a shock by about one-third if monetary policy is not constrained and by about three-fifths if monetary policy is constrained.

In general, proposals from the literature suggest that average contributions to the amount of 0.1 percent to 0.35 percent of GDP already allow a significant stabilisation potential.<sup>45</sup> Beside, addressing the investment needs an era of low interest rates, thus, has important implications for fiscal policy as a macroeconomic stabilisation tool as well. First, a lower IRGD opens some space for preventive funds or fiscal capacities which can be used in severe economic crisis. Secondly, the effectiveness of fiscal policy is likely to be higher in such an environment and should therefore gain more attention from policy makers.

## Policy Implications

This analysis indicates several important findings for fiscal policy makers. Due to favourable conditions on debt dynamics in the medium and long term, there is increased space for active fiscal policy actions. This allows for more ambitious objectives in addressing the lack of public investment in the EU and the increasingly important role of fiscal policy as a macroeconomic stabilisation tool. An important point to note is that this paper provides an economic overview on possible changes in the underlying forces of debt development without prejudice. There is, of course, the possibility of discretionary budgetary measures which have only negligible positive economic effects. A favourable IRGD should not lead populist decision makers to endanger the sustainability of public finances by excessive spending money. In the past years, many countries did not face the problem of an unfavourably IRGD but of exorbitant spending in non-efficient expenditures. Ongoing public deficits lead to substantially high levels of public debt have been reducing the scope to tackle relevant challenges for the future.

This paper should also contribute to policy discussions on the technical design of legal fiscal frameworks. Facing an era of secular stagnation, it is to question on

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<sup>43</sup> COM(2018) 387/978103.

<sup>44</sup> There are specific triggers, such as deviation from long-term unemployment rates.

<sup>45</sup> see Impact Assessment of EISF SWD(2018)297/978107.



how binding fiscal rules should adapt to changing circumstances, e.g. the size of the IRGD has important consequences on the debt reduction path, even if the budget balance is stable. Fiscal rules, however, tend to focus on budget balance figures. A permanent shift in the IRGD, therefore, requires a discussion on the appropriate design of an adequate rule set. As an example, one of the impediments of more expansive fiscal policy is legally binding debt brackets, e.g. the so-called *Schuldenbremse* in Germany. Recently, German economists have started to question the sense of such a rule while the government can lend money even at negative interest rates.<sup>46</sup> It is to argue more generally, how useful such instruments are in times of low interest rates. Nevertheless, debt brackets have advantages too. Long-term projections are prone to major revisions and clear rules may provide stability and tend to be a major anchor for sustainable public finances.

Due to the limited scope, this work only touches upon a small piece of the fundamental developments in macroeconomics. Further research is needed in order to understand the interactions of the different dynamics in a better way, e.g. the effects of higher public investment on real interest rates. Since all relevant factors are endogenous in a macroeconomic system, these interactions could lead to substantial shifts on the path of public finance. Finally, there are some issues which are policy driven and may also have an impact on the future development of the IRGD. Structural reforms, such as raising the retirement age, tackle inequality or introduce measures to pull migrants to overcome a shortage of labour supply and smooth the ageing of the population have important consequences for trend growth, the determination of interest rates and public finances on the revenue and expenditure side. Finally, the recent COVID-19 pandemic has led to an unprecedented fiscal stimulus among advanced economies. Even though interest rates are still low, also due to expanding monetary policy actions, long-term effects and changing government spending habits may change the dynamics of the structural approach presented in this paper.

## Conclusion

Interest rates have witnessed a significant decline in the past decades in the magnitude of several percentage points. In the Euro Area, they have been persistently staying at the zero lower bound since the financial crisis. This trend is not only a decision of central banks but reflects a fundamental change in equilibrium interest rates. As a result, the gap between output growth rates and debt service costs has widened, e.g. the interest rate—growth differential (IRGD) reached historical lows (in fact it was significantly negative in most EU countries). Such a situation allows for much easier debt rollovers and, if prolonged, consequently also calls for a rethinking in fiscal policy acting.

Against this background, it is crucial for medium- and long-term policy making to study the development of the variables responsible for movements of the IRGD.

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<sup>46</sup> see Handelsblatt February 2019—<https://www.handelsblatt.com/politik/deutschland/defizitregel-oekonomen-stellen-schuldenbremse-infrage/24035638.html?ticket=ST-3000544-7jxZUqY2hnW7fezEg5gE-ap2>.



First, there is a lot of evidence that potential output growth in the EU will be lower in the next 30 years than in the past decades; however, pretty stable compared to current growth rates. The reasons are manifold: lower population growth reduces the supply of labour and will contribute less (or even negative) to GDP growth. In addition, a reduction in productivity growth was already observable in recent years. Nevertheless, demographic changes also mean higher capital per worker, and thus, rebounding productivity increases which may offset returns to capital decreased. Higher levels of investment could boost capital intensity and contribute more to growth as well. Hence, long-term growth prospects are assumed to lie between 1.3 and 1.8 percent for the EU.

With regard to interest rates, economists views are more divided. To many observers, the current period of historically low policy rates since the financial crisis seems an unusual and only temporary phenomenon. However, there is strong evidence that the decline of interest rates was subject to a longer-term trend and has been the result of more fundamental changes in the macroeconomic environment such as lower GDP growth, an ageing society, lower investment, excess savings (mainly in emerging markets (EM)) and higher inequality. While some of these trends, like excess savings in EM or lower investment, may be reversed, other factors such as lower growth or demographic developments will very likely continue to put downward pressure on interest rates. These observations are underpinned by a panel regression analysis on the determinants of real interest rates. Thus, interest rates are expected to stay below the average of the past 30 years in the next decades.

Projections on the development of the IRGD support the hypothesis that due to the persistent low interest rates future IRGD will be below past averages as well. Three different scenarios, based on European Commission forecast, on long-term OECD estimations and on own calculations which are built on the foundation of a panel regression analysis, show a negative IRGD for most EU member states for the next decade. Even though the projections suggest an advantageously fiscal situation on aggregate, country-specific results vary widely. An exception is Italy which is likely to be confronted with interest rates larger than growth rates for the next 10 years. In addition, the financial crisis left many EU countries with a high debt burden. The negative IRGD can therefore substantially contribute to a reduction in the debt mountain. Countries with high debt levels should therefore continue their debt reduction path towards a sound fiscal position and increase efforts to implement structural reforms in order to boost long-term growth potential. On the other hand, for countries with lower debt levels and more favourable IRGD the situation provides scope for addressing important needs which contribute to long-term economic success, such as to close the gap of public investment which has been widening over the past years. Furthermore, an era of lower interest rates reduces the effectiveness of monetary policy in response to a crisis and requires a stronger role of fiscal policy. An on-holding period of a favourable IRGD should thus allow for more a ambitious approach for using fiscal policy as a macroeconomic stabilisation tool.

The COVID-19 pandemic has lead to a substantial short-term effect on the IRGD, in particular, due to the massive drop in economic growth. Interest rates are still well below their past levels, though. Thus, the long-term impact of the pandemic on the IRGD is expected to be negligible, provided that it does only pose a temporary shock and does not change the dynamics of advanced economies in the long run.



This paper should not be understood as a *carte blanche* for certain member states to increase their already high debt levels but as a contribution on the long-term perspective of Macroeconomics as a whole. More research is needed in order to better understand the drivers of long-term interest rates and growth potential. Nevertheless, this work aims to mark a starting point in an indispensable discussion on how fiscal policy should look like in the next decades.

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## Appendix

### Additional Graphs

See Figs. 7, 8, 9, 10, 11, 12, Table 5

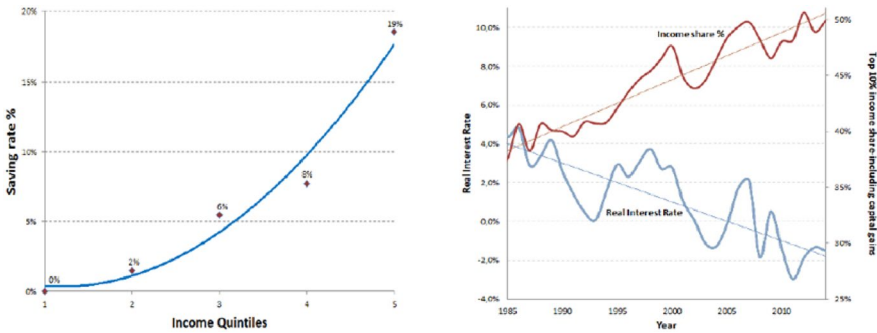


Fig. 7 Inequality and interest rates. Lancaster (2016)

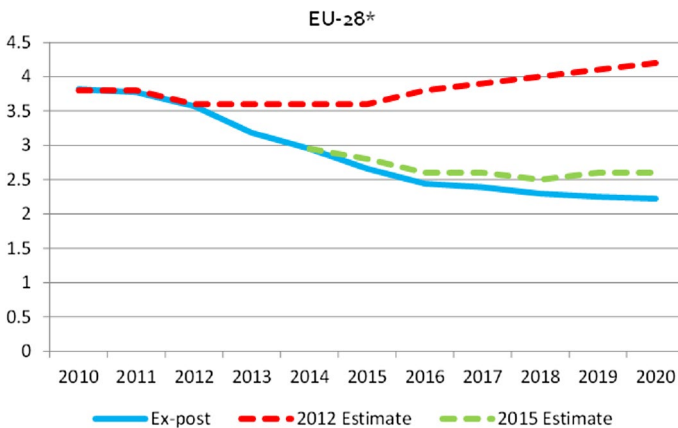


Fig. 8 Implicit interest rate forecast for EU. Based on EUROSTAT and European Commission Reports on Fiscal Sustainability



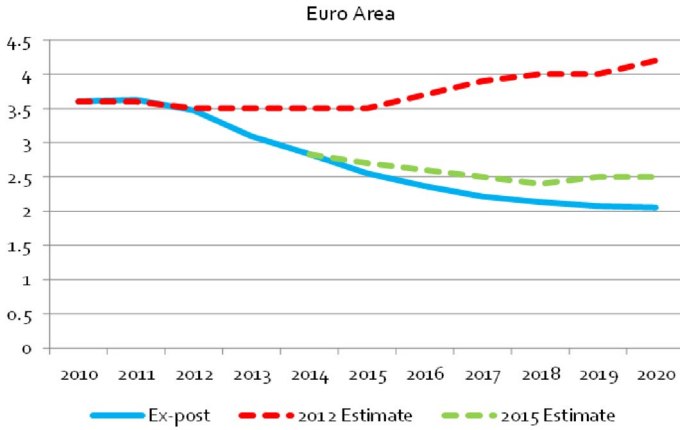


Fig. 9 Implicit interest rate forecast for Euro Area. Based on EUROSTAT and European Commission Reports on fiscal sustainability

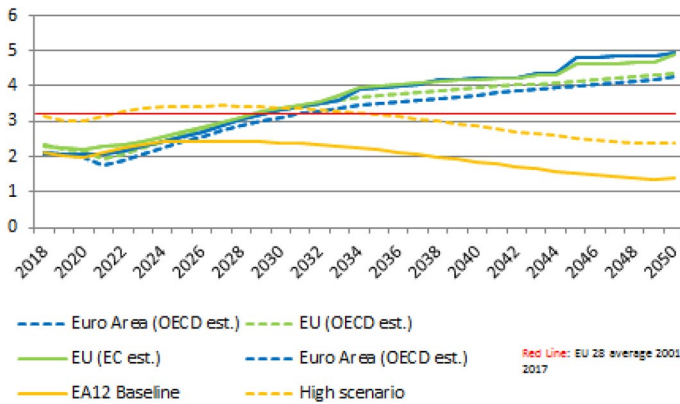


Fig. 10 Implicit interest rate projections. OECD, EC and Baseline Estimations

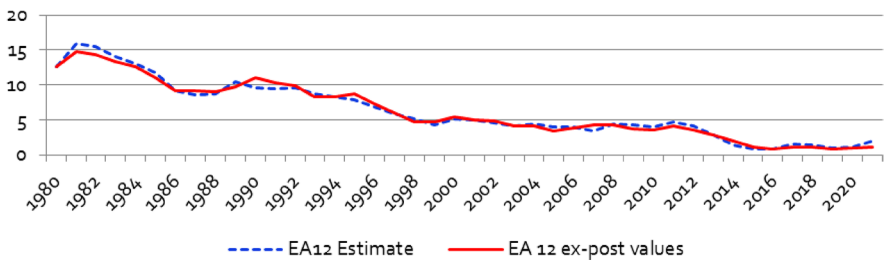
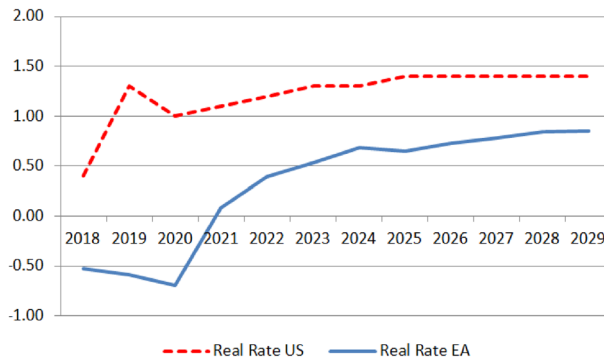


Fig. 11 Baseline model and ex post values. Based on own calculations





**Fig. 12** Baseline estimations 2018 to 2030 for EA12 and USA. *Own calculations and CBO Projections* CBO (2019)

**Table 5** Country-specific projections

	EC			OECD			Baseline		
	Interest	GDP	IRGD	Interest	GDP	IRGD	Interest	GDP	IRGD
Belgium	2.57	3.26	-0.69	2.81	3.72	-0.90	2.43	3.13	-0.70
Bulgaria	3.22	3.51	-0.29						
Croatia	3.67	3.11	0.56						
Cyprus	2.90	3.24	-0.34						
Czech Republic	2.27	3.75	-1.48	3.25	4.24	-0.99			
Denmark	2.75	3.75	-0.77	0.77	3.87	-3.10			
Estonia	0.58	3.88	-3.30						
Finland	1.61	3.20	-1.59				1.32	3.27	-1.96
France	2.54	3.27	-0.73	2.77	3.42	-0.65	2.72	3.00	-0.24
Germany	2.05	3.00	-0.95	1.74	3.16	-1.42	1.73	3.00	-1.27
Greece	2.82	2.55	0.27	3.67	2.82	0.85	3.87	2.65	0.12
Hungary	3.86	4.14	-0.28	4.96	5.26	-0.30			
Ireland	2.58	4.11	-1.53	3.22	4.49	-1.26	2.01	5.00	-3.00
Italy	3.41	2.39	1.02	3.79	2.51	1.28	2.30	1.65	0.64
Latvia	2.57	4.05	-1.48	2.27	3.88	-1.61			
Lithuania	2.56	3.01	-0.45	3.11	3.35	-0.23			
Luxembourg	3.09	4.23	-1.14				2.37	4.16	-1.79
Malta	3.50	5.12	-1.62						
Netherlands	1.66	3.14	-1.48	1.97	3.77	-1.81	2.49	3.09	-0.60
Austria	2.21	3.69	-1.47	2.48	3.65	-1.17	1.92	3.37	-1.45
Poland	3.47	4.28	-0.81	4.16	4.42	-0.26			
Portugal	3.32	2.79	0.53	3.75	3.17	0.59	2.83	2.92	-0.09
Romania	4.35	4.32	0.04						
Slovak Republic	2.53	4.74	-2.21	2.65	4.65	-2.00			
Slovenia	2.56	4.12	-1.56	3.19	3.95	-0.34			
Spain	2.89	3.09	-0.19	2.95	3.01	-0.05	1.61	3.05	-1.44
Sweden	1.17	3.95	-2.78						
EA-12	2.53	3.04	-0.51	2.94	3.22	-0.28	2.29	2.92	-0.63
EU-28	2.66	3.04	-0.51	3.14	3.23	-0.09			

Average values for the period 2018 to 2030 for each country. Own calculations based on EC, OECD and regression model



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