BRIEFING

Requested by the BUDG committee

European Parliament

EU borrowing costs

Drivers and dynamics in times of rising rates

KEY FINDINGS

Debt issuance by the European Commission on behalf of the EU has **increased massively since the launch of the SURE and NGEU** programmes. Of the approximately 400 EUR billion in outstanding EU debt as of May 2023, 85% arises from borrowing since 2020. Large-scale borrowing is expected to continue until 2026 to fund the remainder of NGEU, as well as for concessional loans to support Ukraine.

When these programmes were launched, interest rates were at historic lows – even negative for some maturities. However, **interest rates have risen sharply in 2022**. Beyond the widespread rise in euro-denominated interest rates due to the **ECB monetary tightening**, in response to the surge in inflation, the EU has also faced a **widening of the spread** between its yields and those faced by major European issuers, such as France and Germany. This spread-widening is driven by **a combination of markets features, circumstantial factors, and institutional features**.

The EU cannot affect the overall cyclical movement of interest rates and will have to learn to live with it, like sovereigns do. However, the European Commission should continue its efforts to try to narrow the spread with major European sovereigns, by further developing the relevant **market infrastructure and improving its issuance strategy**. However, the Commission will not be able to do it alone, **institutional developments** including progress on the development of new 'genuine' own resources and a long-term substantial presence in the bond market will be necessary to fully reap the benefits of EU borrowing.

A large share of the EU borrowing (around 420 EUR billion in total, in current prices) is intended to finance unprecedented 'non-repayable support' – Recovery and Resilience Fund grants and additional funding for existing EU programmes under the MFF. The interest costs associated with this part of the debt lie with the EU budget. Our estimates suggest that, due to the high, current and expected, level of interest rates, this **cost could be twice as large as what was initially estimated** at the start of the MFF 2021-27.

As a result, because interest costs for the borrowing of the non-repayable support are accounted for under the MFF 'expenditure ceiling', this will exert further pressure on the funding of important EU programmes, which are already affected by inflation. The EU should thus quickly **review how interest costs are accounted for in the EU budget** and in the MFF.

Introduction

The European Commission has long issued debt on behalf of the European Union (EU), but the scale and nature of this borrowing has changed drastically since the COVID-19 crisis. Historically, the European Commission mainly issued debt to finance three lending programmes to support countries experiencing financial difficulties: the European Financial Stability Mechanism (EFSM) for euro-area countries, Balance of Payment (BoP) assistance for non-euro-area EU countries, and Macro-financial assistance (MFA) for non-EU countries.

Policy Department for Budgetary Affairs

Authors: Grégory Claeys, Conor McCaffrey, Lennard Welslau

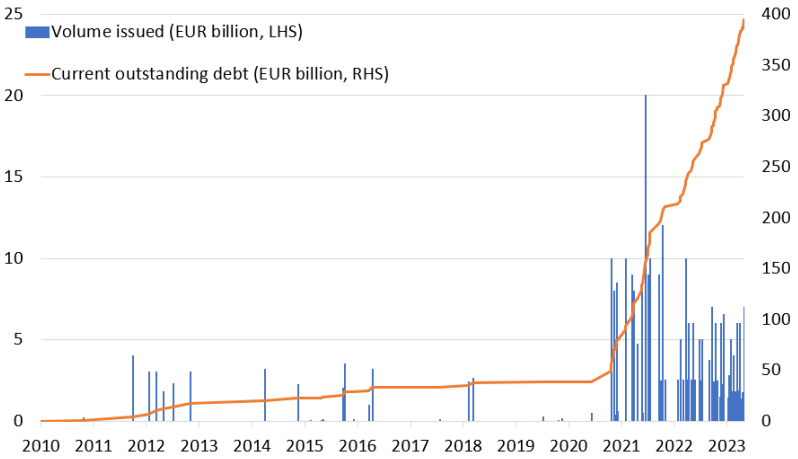
Directorate-General for Internal Policies

PE 749.450 - May 2023

EN

While these programmes are guaranteed in different ways, these loans are all distributed on a 'back-to-back' basis, meaning that, while the countries in question benefit from the more favourable borrowing conditions generally available to the EU, they are directly responsible for the repayments of the debt and interest costs incurred[1]. As a result, until the COVID-19 crisis, EU borrowing had been relatively small in scale and dependent on the timing of the recipients' needs, making the Commission an unpredictable player on financial markets.

Figure 1: Issuance and outstanding debt of the EU (in EUR billion)



Source: Bruegel based on Bloomberg and European Commission.
Note: Data as of 30 April 2023; EU debt includes debt securities issued to finance the MFA, BoP, EFSM, NGEU, and SURE programmes.

This changed in 2020, as the EU massively increased its borrowing to create two new instruments designed to respond to the COVID-19 crisis: the Support to mitigate Unemployment Risks in an Emergency (SURE) and Next Generation EU (NGEU). SURE was designed to reduce the financing cost of national short-term work schemes, which were a crucial tool to avoid an increase in unemployment during the COVID-19 lockdowns, and consisted of 98.4 EUR billion in back-to-back loans distributed to 19 countries between 2020 and 2022. The SURE debt was issued in the form of social bonds[2]. NGEU on the other hand is an active instrument with three functions: to provide loans[3] (up to 385.8 EUR billion in current prices) and grants (338 EUR billion) to EU countries through the Recovery and Resilience Facility (RRF), and to provide additional support (83.1 EUR billion) towards six EU programmes under the Multiannual Financial Framework (MFF)[4].

The introduction of these two instruments changed the nature of the EU as a borrower and entailed a very significant increase in EU debt issuance. Over 93% of the bonds issued by the Commission between October 2020 and December 2022 went towards financing these two instruments, and of the approximately 398 EUR billion in outstanding EU debt as of 30 April 2023, over EUR 350 billion comes from borrowing since October 2020 – ie when SURE borrowing started[5]. As a result, the total outstanding debt of the EU (Figure 1) is already larger than the debt of some EU countries such as Austria and Greece and should exceed the nominal level of debt of the Netherlands in 2024. Moreover, to issue efficiently such a large amount of EU debt, the European Commission quickly built a comprehensive borrowing strategy, based on the best practices of major EU issuers, using a mixture of syndicated transactions and auctions and relying on a large primary dealer network[6] (details on the number, the average size of issuances and the coverage ratio of each type of operations can be found in Table A1 of the Annex).

1 An exception is the MFA+ programme providing support for Ukraine after the Russian invasion, where the EU announced that it would service the interest costs on the borrowing as a mark of solidarity (https://ec.europa.eu/commission/presscorner/detail/en/ip_23_228).
2 See details in https://commission.europa.eu/system/files/2020-10/eu_sure_social_bond_framework.pdf
3 As of April 2023, only 7 countries have requested loans under this facility. The deadline for doing so is August 2023. Unclaimed loans can be used to finance RepowerEU.
4 ReactEU, Horizon, RescEU, InvestEU, the Just Transition Fund and the European Agricultural Fund for Rural Development.
5 Between June 2021 and December 2022, 170 EUR billion, including 36.4 EUR billion in green bonds, was issued to support NGEU. As discussed later in the paper, from January 2023, the Commission moved to a 'unified funding strategy', meaning that EU debt is not issued per programme anymore, but through general EU bond. As a result, the breakdown of the share of issuances by programme stops at the end of 2022.
6 See Christie *et al.* (2021) for a detailed explanation on the EU borrowing strategy, on its primary dealer network and on the differences between syndicated transactions and auctions.

Beyond the scale of the borrowing, the two programmes are markedly different, both in terms of their purposes but also of their impact on the EU budget. SURE loans were issued on a back-to-back basis, meaning that the responsibility for servicing this debt and for paying the interest rate costs falls on each of the 19 countries who requested this support. For NGEU loans, while the debt is guaranteed by the EU budget, including through an increase in the own-resources ceiling[7], the costs associated to the debt is also borne by countries in question.

That leaves 420.1 EUR billion in so-called 'non-repayable support' in the form of RRF grants and additional EU programmes' financing. The cost of repaying the borrowing related to these expenditures, as well as the associated interest costs, will be serviced through the EU budget. Given the large amounts that will need to be repaid it will either take place through the creation of new own resources, or as a last resort through an increase in member states contributions to the budget (using the increase in the callable headroom)[8].

Simultaneously to these fundamental developments in the establishment of a more sophisticated EU borrowing toolbox, another major economic trend of the last couple of years has been the global return of inflation and a sharp rise of interest rates after years of below-target inflation and historically low rates in advanced economies.

Given the magnitude of the EU borrowing and the fact that such an increase in interest rates was not expected when these programmes were launched, it is crucial to examine how the cost of the EU debt has evolved since their inception in 2020-21. This policy brief also intends to understand more specifically what the main drivers behind the recent evolution of EU yields have been, as well as to estimate what the interest costs borne directly by the EU budget could amount to until the end of the 2021-27 MFF, given today's level of interest rates and current market expectations on how rates might evolve in the next four years. The brief concludes with policy recommendations that could help reduce the cost of EU borrowing in the future.

Borrowing cost developments since the start of EU large-scale debt operations

When the EU started its large-scale borrowing operations, in 2020 for SURE and in 2021 for NGEU, interest rates in Europe and in other advanced countries were at historic lows, after being on a downward trend for several decades (Figure 7)[9]. As a result, until the beginning of 2022, the EU borrowed at very favourable rates across all maturities – even at negative rates for maturities below 10 year (Figure 2 and 3). Moreover, at the time, markets expected rates to remain relatively low in the foreseeable future, which means that when the European Commission estimated how much borrowing costs would amount to for the whole 2021-27 MFF, they expected a cumulative interest cost of only 14.9 EUR billion until 2027[10].

However, interest rates began to rise sharply in 2022. For instance, 10-year yields on EU bonds increased from negative levels to more than 3% in less than a year (Figure 2 Panel A). Besides, and more interestingly, EU yields, which had been between German and French yields for most maturities until February 2022 (Figure 2 Panel A and B), started to exceed French yields after the start of the Ukraine war. And as of April 2023, the EU yield curve was not only significantly above the French one, but also near or even above the Spanish one for maturities up to 2 years, despite enjoying a much better rating than France and Spain (with respectively median ratings of AAA, AA and A-, see Table A2 in the Annex).

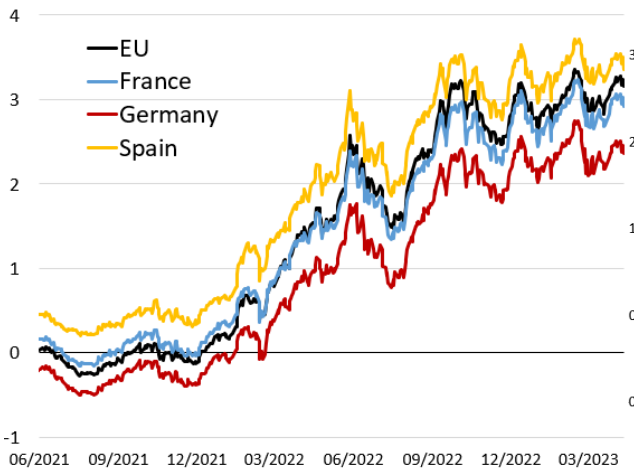
[7] EU countries agreed in 2020 to increase the EU's debt guarantees via an added 0.6% of EU gross national income (GNI) in callable headroom (see Christie *et al*., 2021 for details on the functioning of the guarantee)

[8] See own resources decision: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020D2053

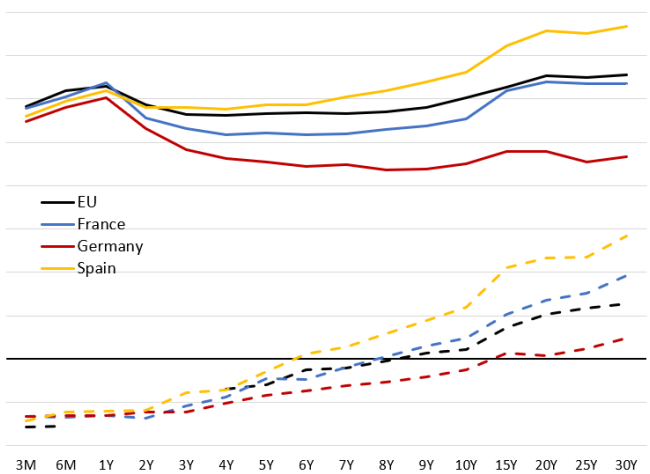
[9] For explanations on the fall in the level of interest rates in the decades before COVID-19, see Zettelmeyer *et al*. (2023).

[10] Source: https://commission.europa.eu/system/files/2021-01/mff_2021-2027_breakdown_current_prices.pdf

Panel A: 10-year benchmark yields (in %)



Panel B: yield curves in January 2022-April 2023 (in %)



Source: Bruegel based on Bloomberg. Notes: dash lines represent data as of 3 January 2022 while unbroken lines represent data as of 11 April 2023. For January 2022, the EU yield curve was incomplete so the values for the 1- and 3-year maturity yields are extrapolated.

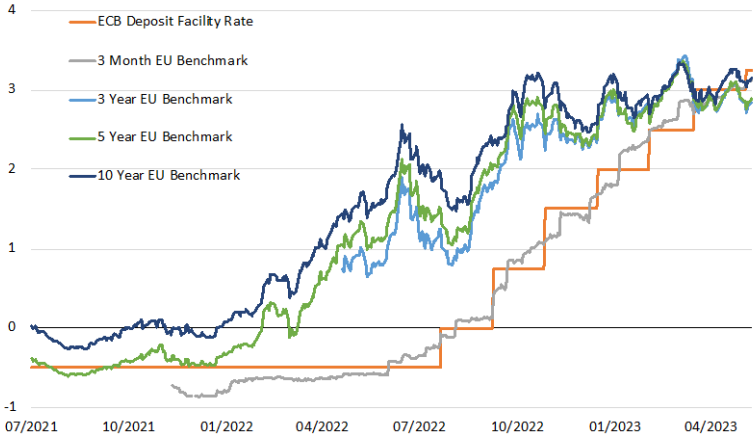
Thus, two key drivers account for the substantial rise in EU yields in 2022: firstly, the rapid increase in all euro-denominated short-term rates in 2022 due to the European Central Bank (ECB)'s monetary tightening, and secondly, and more interestingly, the notable increase in the spread between EU yields and German (as well as French) yields.

Monetary policy tightening by the ECB to tame above-target inflation

The strongest (and most obvious) driver behind the sharp increase in EU yields during the year 2022 was the tightening of the ECB monetary policy to tame inflation. Indeed, the combination of supply-side bottlenecks caused by the on-going COVID-19 pandemic in some regions of the world, the quick reopening of the euro area economy in 2021 and a strong increase in energy prices because of the war in Ukraine in 2022, led to a sharp increase in inflation in the euro area, up to double digits for the first time in four decades.

The ECB first ended its net asset purchases in the first half of 2022 and then started hiking its policy rates in July 2022. The increase of the ECB's deposit facility rate, its main policy rate to steer short-term market rates, by 375 basis points (bps) – from -0.5% to 3.25% (Figure 3) – at the time of writing, represents the first round of hikes of the ECB since 2011 and the sharpest cumulative increase since its creation in 1999. Logically, as soon as market started expecting the ECB's monetary tightening, EU yields of all maturities, like all other euro-denominated rates, started increasing quickly (Figure 3).

Figure 3: EU rates across maturities and ECB main policy rate (in %)



Source: Bruegel based on Bloomberg. Note: changes in the ECB Deposit Facility Rate as of announcement date

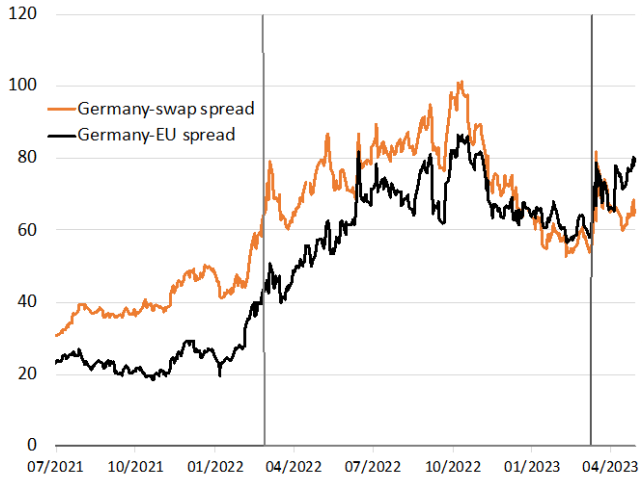
While most observers did not foresee such a resurgence in inflation and a sharp monetary tightening after the COVID-19 crisis until the end of 2021, the increase in EU yields as a result of the ECB's monetary tightening is not inherently surprising (Claeys, 2023). To make it simple, medium- and long-term rates are mainly determined by the expected path of short-term rates over the life of the asset plus a term premium for holding long-term debt instead of rolling over short-term debt across the entire period. Bond yields therefore fluctuate with the business cycle and with central banks' policy rate movements, and EU bond yields are no exception.

However, in the case of EU bonds this is not the end, or even the most interesting part, of the story. The general increase of euro-denominated rates may quantitatively be the main driver behind the recent surge in EU yields, but it does not explain why EU yields have been increasing more than some European government yields, such as Germany, France or even Spain's yields.

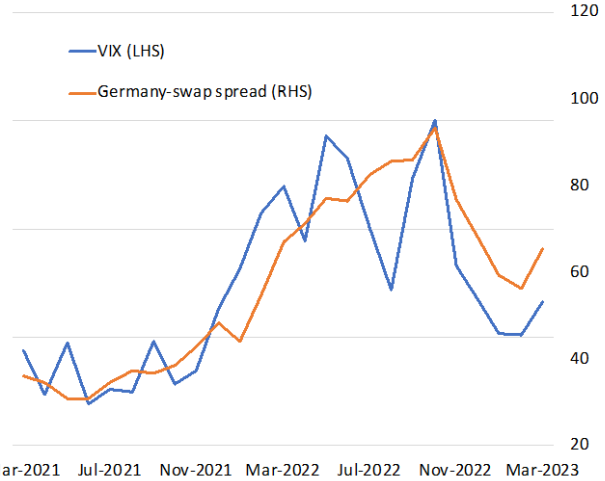
Higher spreads versus European government bonds

Indeed, the most remarkable development as far as EU bond yields are concerned in 2022 is the increase in the spread between EU and German yields for all maturities (Figure 2 Panel B). For instance, the spread between the 10-year EU yield and German yield, which had been stable around 20 bps during the whole year 2021, rose sharply (especially after the start of the war in Ukraine) to reach a level above 80 bps in October 2022, before receding towards 60bps, and increasing again recently when the banking turmoil started, first in the US, with the failure of Silicon Valley Bank, and then in Switzerland with Crédit Suisse (black line in Figure 4 Panel A).

Panel A: EU and swap spreads vs Germany (in bps)



Panel B: VIX and Germany-Swap spread (in bps)



Source: Bruegel based on Bloomberg. Notes: Panel A: 10-year spreads between EU yields and swaps vs Germany (in bps), the first vertical line is 24/02/2022, the date of the Russian invasion of Ukraine. The second vertical line is 10/03/2023, when Silicon Valley Bank was placed under receivership. Panel B: Monthly average of the VIX index and the German Bund-Swap spread (in bps). The VIX Index is a measure of 30-day expected volatility of the U.S. stock market, derived from mid-quote prices of S&P 500 call and put options. It is one of the most recognized measures of volatility, widely reported by financial media and followed by market participants.

Potential explanations behind the 2022 spread widening

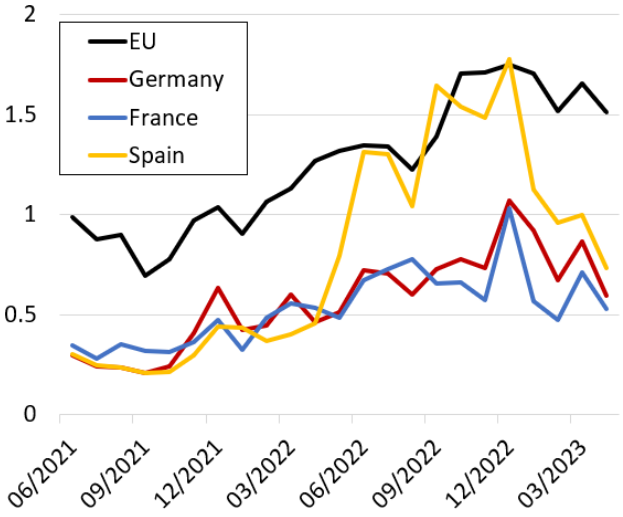
But what are the underlying factors behind this rise in the spread between German yields and EU yields? Providing a definitive answer to this question is challenging as various factors likely contributed simultaneously, making it difficult to disentangle their individual effects. In addition, some of these factors are difficult to quantify and even sometimes to substantiate using publicly available data. So, to understand what has happened to EU yields recently, we have conducted interviews with a broad range of stakeholders that engage with EU debt on a regular basis and represent diverse perspectives: traders, fixed-income strategists from leading European banks, asset managers, experts from central counterparty clearing houses (CCPs), national Treasuries officials, debt-management office (DMO) officials from EU member states and European institutions, etc. The potential reasons behind the divergence of EU yields that we have compiled through these discussions can be conveniently grouped – albeit somewhat arbitrarily, as they are all ultimately interconnected, as we will see – into three main types of explanations: 1) markets features, 2) circumstantial factors, and 3) institutional features.

Market features: differences between EU bonds and European government bonds

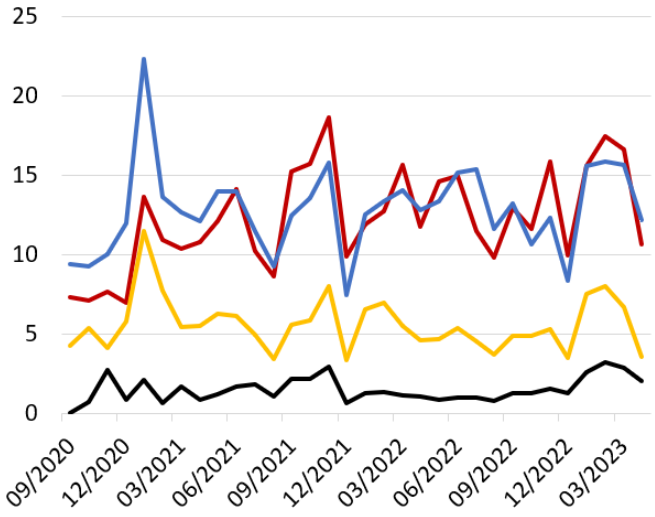
Even though EU bonds have radically changed in nature and in magnitude with the establishment of SURE and NGEU, there are still major differences with European government bonds, and in particular with those that play a benchmark role in European financial markets such as German or French bonds, which make them imperfect substitutes for these bonds at this stage.

A key distinction between EU and these government bonds is their **liquidity**, which refers to the ease with which they can be exchanged for cash. In general, investors prefer assets that can be quickly and easily resold and are willing to pay a premium for such liquidity. This is particularly true in a market environment characterised by rising rates and volatility, such as the one we are experiencing today, as well as during times of high stress or uncertainty, such as during geopolitical or banking turmoil episodes that have occurred in the last 18 months. In such situations, investors may need to sell their assets quickly, making liquidity an especially valuable attribute.

Panel A: Average bid-ask spreads (in bps)



Panel B: Volume of securities traded daily (in EUR billion)

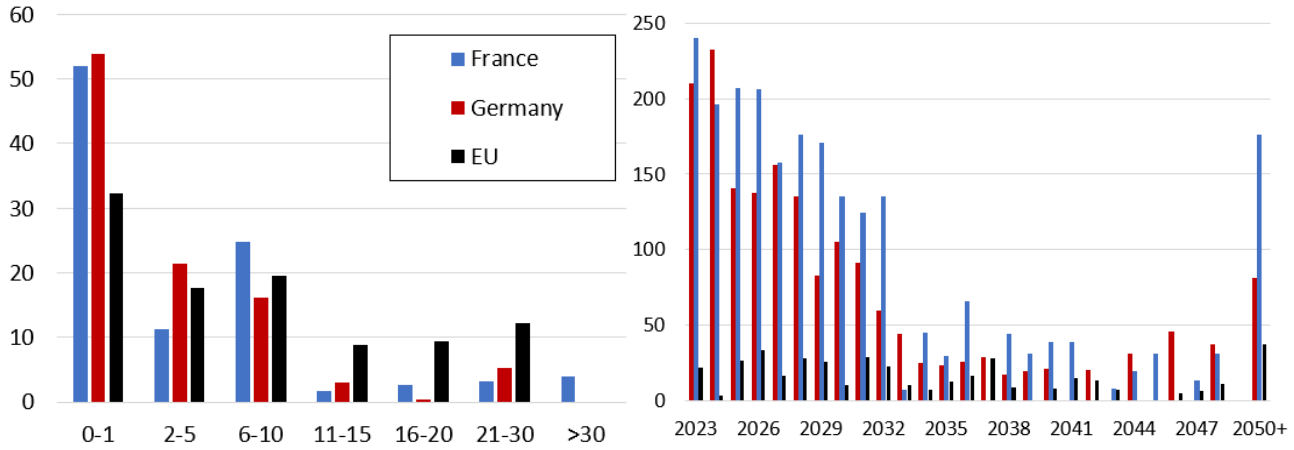


Source: Bruegel based on Bloomberg. Notes: Panel A: Monthly average of bid-ask spreads for 10-year bonds for selected issuers in basis points. Panel B: Monthly average of daily volume of security trades by issuer in EUR billion

At this stage, the liquidity of EU bonds is much lower than the liquidity of other major European issuers. A good measure of liquidity is the bid-ask spread – ie the difference between the highest price that a buyer is willing to pay for an asset and the lowest price that a seller is willing to accept at a given point in time. Over the last two years, the average bid-ask spread on EU bonds is twice as high as the French and German ones, and most of the time higher than the one for Spanish bonds, indicating a much lower liquidity of EU bonds (Figure 5 Panel A**)**.

Even if the EU is now considered as a large and frequent issuer which competes with major issuers in the primary market, the EU debt that is traded daily in the secondary market is still much smaller than the one of other major European issuers (Figure 5 panel B). This is logical given that its total outstanding debt is still much smaller (eg around 400 EUR billion for the EU vs 2.3 trillion for France, see Table A2 for other comparable issuers in the Annex). Moreover, the EU yield curve is still very much in construction: even if the EU is now present along the whole curve at all maturities (Figure 6 Panel A), the outstanding amount of bonds at each point still represents only a small share of Germany or France (Figure 6 Panel B). Having a **full curve** with a significant number of trades at each point helps to boost arbitrage trades and thus overall liquidity.

Panel A: share of issuance by maturity in 2022 (in % of total) Panel B: Debt by redemption date (in EUR bn)



Source: Bruegel based on Bloomberg. European Commission, Agence France Trésor and Deutsche Finanzagentur. Notes: Panel A: Issuance in 2022 by maturity (in % of total issuance) Panel B: Scheduled redemptions of outstanding debt (in EUR billion LHS).

If liquidity plays a crucial role in the appeal of a particular security, other market features are also seen as highly desirable by investors. Among them, the possibility to post a security as **collateral** to obtain cash easily and almost at par is often considered crucial by investors. On that front again, EU bonds does not fare well compared to major European issuers. The announcement by the ECB on 20 December 2022 (ECB, 2022) that it will accept EU bonds as a collateral in its monetary operations with the same haircut as similarly rated sovereigns from 29 June 2023 on constitutes a milestone for the EU and sends a strong signal to market participants (and also shows the support from another influential EU institution). However, in CCPs, which are increasingly used to centralise financial transactions, in particular repo operations, the eligibility as collateral and the haircuts applied are still different for the EU than for European government bonds (EGBs). Haircuts applied to EU bonds by the most important CCPs (LCH, Eurex Clearing, Ice Clear Europe and Euroclear) are indeed much higher than the one applied to Germany and France (see example for a 10-year bond in Table A2 of the Annex). Most CCPs now have their own risk management frameworks and do not rely on the ECB risk management framework and are thus not expected to automatically follow the ECB in June. Besides, the use of EU bonds as collateral in CCPs remains negligeable, especially compared to the use of German and French bonds (see the numbers for collateral in repo operations in Table A2).

More generally, although EU bonds are now subject to the same favourable regulatory treatment as the highest-rated EGBs[11], financial institutions still treat them differently in practice. For instance, in **internal risk models** of financial institutions, EU bonds are often considered riskier and are assigned higher risk weights due to their relative lack of history compared to government bonds. Additionally, EU bonds are often traded on a separate desk from government bonds – the SSA desk – with much smaller trading and exposure limits, which further reduces their liquidity.

The appeal of a bond can also be enhanced by its inclusion in a specific bond index. These indices, initially created to measure the performance of the aggregate or of a specific segment of the market, have become increasingly relevant as passive investors rely on them to construct their portfolio[12]. As EU bonds are not currently part of the most widely used **sovereign bond indices**[13] – currently composed only of central government bonds issued in own currencies (Eichert and Tanguy, 2023a) – they have access to a smaller and less diversified investor base[14]. This is particularly significant given the growing importance of passive investing in recent years.

Other specificities of EU bonds are hindering their popularity and contribute to the interest rate premium paid by the EU compared to Germany. To name the most important ones: the absence of a **repo facility** managed by the EU like the one managed by the German DMO to enhance liquidity and avoid temporary scarcity episodes for instance, the absence of **futures** on EU bonds (which boost trading and liquidity by giving traders some material to build trades), the smallest presence of EU bonds **quoted on electronic platforms**, the **fragmentation** of bonds between the various EU programmes (NGEU, SURE, Green NGEU, MFA, BoP, EFSM), which also reduced the overall liquidity of EU bonds.

However, the European Commission is aware of these issues and has launched **various initiatives** to deal with them. To reduce fragmentation between different programmes, the EU moved to a unified funding strategy in January 2023 (EU, 2022). This means that all the different programmes supported by EU borrowing will be financed with standardised EU bonds instead of different programme bonds (even if some diversity of bonds will remain with Green NGEU bonds and SURE social bonds). Such a unified strategy, which will also allow the EU to use more tapping of existing bonds should help increase the liquidity of its debt (Bletzinger et *al.*, 2022), something also highlighted by investors in a recent survey on EU bonds (Eichert *et al.*, 2022). When it announced the launch of its unified funding strategy, the European Commission also announced other initiatives in the pipeline: it is working on establishing a repo facility for 2024 to boost liquidity, and it is putting in place a price quoting commitment for its primary dealers which should be in place in the summer 2023 (see also Table A2 for details on primary dealer obligations)[15].

Finally, a last substantial difference between the EU and countries like Germany, France and Spain remains in terms of **issuance strategy**. The EU relies massively more than these countries on syndications than on auctions for its debt issuance: syndicated transactions represent 51% of the EU debt issued in 2022 while for Germany, France and Spain they only account for 4%, 2% and 13% respectively (Table A2). It is understandable that, as a new major issuer that needed to establish itself on the market, the EU preferred to ensure a large demand for its debt and to highlight the oversubscription in its first borrowing operations than to minimise costs, and this is probably easier to do through syndications with the help of major European banks. However, the much higher level of oversubscription in syndications compared to auctions[16] – in which the bargaining power of investors is smaller – might suggest that the European Commission is selling its bonds at a too cheap price (ie conversely at a too high yield).

[11] They are considered as a Level 1 High-quality liquid assets (HQLA) in Liquidity Cover Ratio (LCR) calculations and in capital requirements with 0% risk weight for banks in the Basel III framework and no capital charge in solvency requirements for insurance companies in Solvency II.

[12] Passive investing refers to a buy-and-hold portfolio strategy for long-term investment horizons, with minimal trading in the market. Index investing is the most common form of passive investing, whereby investors seek to replicate and hold a broad market index or indices.

[13] The most widely used indices are S&P Dow Jones Indices, Bloomberg Fixed Income indices, ICE Fixed Income Indices, FTSE Russell, MSCI and JP Morgan (Eichert and Tanguy, 2023a)

[14] See the difference in investor base in Figure A2 in annex.

[15] Source: https://ec.europa.eu/newsroom/budget/items/770837/en

[16] The cover ratio is 9.6 for syndications and 1.9 for auctions, see Table A2.

In theory, all these structural market features of EU bonds should mainly explain the level of the spread between EU and German yields, but not its recent increase (unless some of these features have become more important for investors in recent months, which might be the case, as we have seen for liquidity at the beginning of this section). However, when bond prices diverge, these differences act as frictions that reduce the substitutability between EU bonds and EGBs, which hinders arbitrage opportunities and thus impedes the self-correction that would result in a narrowing of the spread.

To explain the specific evolution of EU yields since the start of 2022, it is also crucial to understand one last market feature which is how EU bonds are priced in financial markets. Indeed, one reason why EU yields have diverged in 2022 is because EU bonds and sovereign bonds are priced differently by market participants. Like the debt securities of other entities considered as Supranationals, Subnationals and Agencies (SSAs), EU bonds are mainly **valued in comparison with swaps**[17], while European government bonds (EGBs) are generally priced in comparison with German bonds (also called Bunds).

There are several reasons why SSAs are traditionally priced against swaps instead of Bunds. This generally reflects the increasing role of the swap curve as a benchmark in financial markets, given its large market size and frequent use in hedging and positioning activity[18]. But more specifically, in the SSA market, some issuers – mostly public and multilateral development banks – often employ swaps to manage the interest rate risk that arises from the mismatch between their liabilities and assets' maturities. The spread to swaps is thus a significant factor in their cost calculation. Consequently, traders have adopted the practice of using the swap curve as a benchmark in their pricing models to value the bonds of SSAs. In the end, whatever the reason behind this market convention is, the result is that the EU yield curve is much more correlated with the swap curve than with the German one (Figure 4 Panel A).

Circumstantial explanations

One reason behind the increase in the EU-German spread is that, since the start of 2022, swaps and German yields have faced two **opposite dynamics**.

On the one hand, German yields have increased at a more modest pace than most interest rates, as they benefited from an increase in risk aversion, compared to swaps (see eg the strong correlation between the VIX index, which measures expected volatility in financial markets, and the German-swap spread visible in Figure 4 Panel B). Such a flight to quality/liquidity towards German bonds is to be expected during high stress episodes such as the war in Ukraine or the banking turmoil that started with the failure of Silicon Valley Bank (which are both visible in Figure 4). In addition, the substantial increase in collateral needs resulting from the general increase in volatility in financial markets and the sizable margin calls[19] linked to surging energy prices in the spring and summer of 2022[20] further contributed to the high demand for German bonds, exacerbating their already significant scarcity resulting from years of ECB Quantitative Easing. The peak in the spread between Bunds and swaps/EU yields coincided with the period when concerns around collateral scarcity were most pronounced, namely in October 2022. However, subsequent measures taken by the Deutsche Finanzagentur and the ECB to alleviate collateral scarcity (ICMA, 2023) concurred with a narrowing of the spreads at the end of 2022 and beginning of 2023 (Figure 4 Panel A).

---

17 A swap is a financial contract in which two parties exchange an annual fixed payment for a specified period, in return for a floating short-term rate. The fixed rates for various maturities are used to construct the swap curve. The swap most often used in this case for euro denominated assets is the swap against the six-month Euribor.

18 See details on the swap market and its benchmark role in Remolona and Wooldridge (2003), Kreicher *et al.* (2017) and Dalla Fontana *et al.* (2019).

19 A margin call is a demand from a brokerage house to a customer that more money or securities be deposited in their account when the amount in it falls below what is stipulated as necessary to covers financial transactions.

20 As noted by the ESRB (https://www.esrb.europa.eu/pub/pdf/other/esrb.letter230320_on_emir_review_mep~058e272ec7.en.pdf), the EBA (https://www.eba.europa.eu/sites/default/documents/files/document_library/About%20Us/Missions%20and%20tasks/Correspondence%20with%20EU%20institutions/2022/1039915/EBA%20response%20to%20EC%20request%20on%20energy%20markets.pdf), or the Financial Times (https://www.ft.com/content/b58480fb-b9de-4316-af21-b82167ef3e20), there is plenty of anecdotal evidence supporting this, but not much public data available, as CCPs do not share this data publicly.

On the other hand, swap rates also increased more quickly than EGBs in 2022 because of the high demand to these financial products from financial institutions in need of hedging themselves against the interest rate risk resulting from the unexpected general rate increase. These two opposite developments led mechanically to an increase in the Bund-swap spread, and, given the benchmark role swap rates play for EU yields, in an increase in the Bund-EU spread too.

Another potential circumstantial explanation that might have contributed to the increase in the spread, which is also regularly mentioned, is the **end of the ECB net asset purchases** in the first half of 2022. This occurred at a time when the supply of EU bonds was very abundant, which could have made it more difficult for investors to absorb them (Bonfanti and Garicano, 2022). This factor may have played a role since the ECB faced fewer constraints when purchasing supranational bonds, such as EU bonds, as the issuer limit was set at 50%, than when buying euro-area government bonds, with a 33% limit. This meant that the ECB could buy a higher share of the flow of recently issued bonds and thus have a higher positive impact on their price than on the price government bonds. This effect disappears when the net purchases stop (or more precisely when they are expected to stop). This has probably contributed to the increase in the spread. However, the impact of the end of ECB purchases might be more ambiguous than it seems[21], as the higher volume of bonds available to market participants to trade could also increase their liquidity, potentially reducing the yield premium paid by the EU for lower liquidity. Which effect dominates is difficult to determine.

Institutional features: the EU is still conceptually very different from sovereign issuers

Some of the elements discussed in the previous two subsections already hint at the fact that institutional factors play a crucial role in explaining why borrowing costs are higher for the EU than for Germany (or France). Its non-inclusion in sovereign bond indices, or the fact that the EU is considered as an SSA and therefore evolve in a different market in which the main benchmark is the swap and not the Bund highlight that EU bonds are different than sovereign bonds. In fact, even if we listed it as a circumstantial reason, the fact that EU yields moved with swaps and thus rose more quickly than Bunds' yields during stress episodes shows that EU debt securities, despite their very high rating, do not have yet the essential property of safe assets which is to credibly store value at all times, especially during crises (Caballero *et al.*, 2017).

Most rating agencies consider that the guarantee for the EU's debt provided by the own resources ceiling and its increase in 2020 is in practice equivalent to 'joint and several liability', meaning that each country should be liable to repay the debt both individually and jointly, which underpins its high ratings[22]. However, some have interpreted the widening of the spread with Germany in 2022 as a possible signal that market participants are starting to doubt the legal framework underpinning the EU's debt (Kraemer, 2023). This interpretation is probably exaggerated given that ESM and EIB yields have evolved similarly as the EU even though they benefit from a very different type of guarantee (supported by paid in and callable capital in their case). However, it is undeniable that a majority of investors see the EU as an "*inbetweener*", ie a hybrid issuer between an SSA and a sovereign (Eichert *et al*. 2022). This view is largely justified by three main institutional features of EU debt.

First, the EU is not supposed to be a permanent player in the bond market. The legal framework of the recovery instrument states that the net issuance of EU bonds should end at the end of 2026 and that after that there should only be a partial roll-over of the debt to reduce it gradually until it is fully extinguished in 2058. This will reduce drastically the liquidity in the EU bond market after 2026 and thus reduces the appeal of the bonds already today, as EU bonds cannot be part of long-term investment strategy/portfolio (Eichert *et al*. 2022). Moreover, the development of a futures market would not be viable if the EU is not present in a consistent way with a steady stream of issuance and if liquidity falls after 2026.

[21] It is also impossible to measure precisely this effect given that the ECB does not release the detailed data on its purchases of supranational bonds.

[22] Currently, Fitch, Moody's and DBRS rate the EU's debt as AAA, while Standard and Poor's rates the EU's debt as AA+.

Second, even though the EU has some features of a sovereign, with a legislative branch and a judicial branch it misses a key feature of the usual definition of sovereignty which is taxation power. Even if the EU can indirectly access member states' resources through the GNI-based contributions, it also signals to markets that the EU is fully reliant on its members and their difficult negotiations for its financing, and thus different from a sovereign which can resort to taxation very easily and quickly. This is also in fact probably one of the main reasons why the EU does not fulfil the criteria to be included in the main sovereign bond indices (Eichert and Tanguy, 2023a).

And third, the supranational nature of the EU also results in the fact that the EU does not have a natural domestic buyer base to tap into (which is often prevalent during stress times, for better or for worse) because European banks are still predominantly national and still exhibit a very strong domestic bias in their asset holdings (Beck *et al*., 2022). Only a real internationalisation of banks at the European level, probably driven by the completion of the banking union, could help on that front.

These institutional elements explain why EU borrowing costs are higher than the ones of Germany (despite a similar rating) or France (despite a higher rating). But why did this spread increase in 2022 then? Even though the temporary nature of the EU borrowing had been written in stone since the launch of the large-scale EU borrowing, it seems that markets were initially convinced of the 'Hamiltonian moment' nature of the 2020 decision to borrow together to finance the COVID-19 recovery package, and that the recovery fund, in some way or another, and the bond issuance associated to it would quickly become permanent[23].

However, during the year 2022, markets received a clear and repeated signal from some EU countries that they were serious about the fact that they saw the massive EU borrowing only as a one-off response to a once-in-a-century shock. Even though the idea to build a NGEU-like tool – first to deal with the energy crisis and later to respond to the US Inflation Reduction Act – floated around during the whole year 2022, the idea never materialised. This led markets to adjust their expectations about the permanence of the EU presence in the bond market. The increase in spread in 2022 can then be seen as a lengthy price discovery as the limited life of NGEU became more tangible to market participants. In addition, the absence of progress on 'genuine' own resources in 2022, despite the proposal made by the Commission at the end of 2021[24], probably achieved to convince markets that EU borrowing would not be permanent. In fact, the share of investors considering the EU only as an SSA and not even as an inbetweener increased by 10 percentage points between November 2021 and 2022 (Eichert *et al*. 2022). These various developments on the institutional front probably played a significant role in the spread widening of 2022.

Projected borrowing costs borne by the EU budget in the coming years

As discussed previously, the EU will borrow a total of 420.1 EUR billion, in current prices, for 'non-repayable support' (i.e., for RRF grants and additional EU programmes' financing) before the end of 2026. The interest costs associated with this borrowing will be serviced through the EU budget[25]. It is therefore crucial to estimate how these costs could evolve until the end of the current 2021-27 MFF.

This estimate will be highly dependent on the evolution of interest rates in the coming years. At this stage, market participants' median expectation is for rates to stay at around their current level over the next few years. Indeed, investors expect the 10-year euro swap rate – a good proxy for the EU yields as discussed above (+/- a small spread, eg of around 10bps on average on 10-year rates) – to only fall slightly towards 2.8 percent by 2026 (Figure 7). One way to quantify uncertainty around this baseline projections is to derive probabilities of different scenarios from swap option prices. This approach suggests that uncertainty about the level of nominal interest rates in the euro area is very high, even at the 3-year horizon. With 50 percent

[23] See for instance: http://www.international-economy.com/TIE_Su20_EUHamiltonSymp.pdf
[24] See: https://ec.europa.eu/commission/presscorner/detail/en/ip_21_7025
[25] The interest costs on the remainder of the EU debt (incurred for SURE and NGEU loans) will be borne directly by the EU countries which have requested these loans.

probability, investors expect it to be in the 1.9 percent to 3.7 percent range in 2026, while the 90 percent probability interval ranges from 0.1 percent to 6.2 percent, as shown in Figure 7.

How does this translate into actual EU interest costs? Combining data on the EU's current debt stock with estimates of future financing needs, the maturity structure of current debt, market expectations for the level and volatility of future interest rate, and average spreads between swaps and EU yields allows us to make projections for annual interest costs that will be serviced by the EU[26].

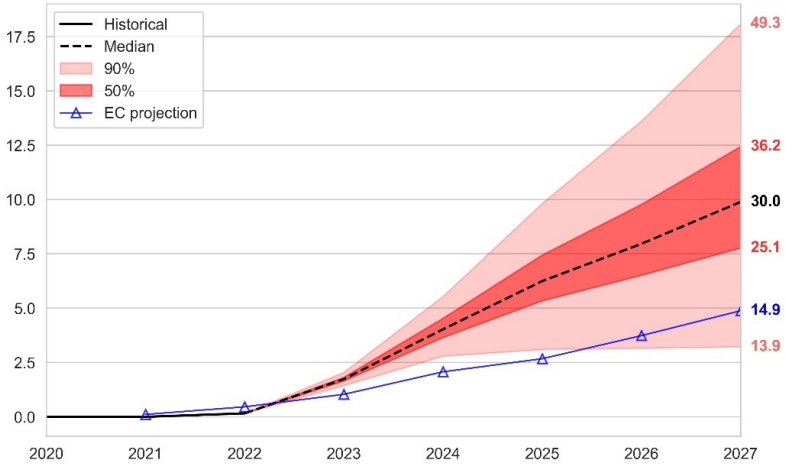
Our results, displayed in Figure 8, suggest that it is highly probable that the interest costs on EU debt borne by the EU budget will be much higher than what was forecasted by the European Commission at the beginning of the MFF in 2021 (the blue line with triangle markers in Figure 8). While the Commission's initial forecasts envisaged annual interest costs to increase slowly towards around 5 EUR billion in 2027 (and overall costs for the whole MFF to be around 15 EUR billion), our baseline scenario envisages that annual costs could be twice as large, reaching 9.9 EUR billion in 2027 (while total costs would amount to 30 EUR billion, see bold numbers on the right side of Figure 8). However, again, given the high uncertainty surrounding the level of interest rates in the coming years (represented by the large confidence intervals in Figure 7), costs could considerably vary around our baseline estimate: with 50 percent probability, interest costs should be in the 7.8 to 12.4 EUR billion range in 2027, while the 90 percent probability interval ranges from 3.2 to 18.1 EUR billion, as shown in Figure 8.

How should the EU deal with the large uncertainty surrounding its interest costs? As discussed previously, it is normal for rates and thus for interest costs to fluctuate with the business cycle. The EU will thus need to learn to live with this and optimise its borrowing strategy – for instance in

Figure 7: 10-year swap rate, expected rate and option-implied confidence intervals (in %)

Source: Bruegel based on Danske Bank and Bloomberg. Notes: The chart displays historical and possible future values of the 10-year euro swap rate. The 10-year euro swap rate reflects the markets' expectations of the average short-term rate over the next 10 years and can thus be interpreted as a good proxy for the 10-year EU yields. Dark and light red shaded areas correspond to the 50 and 90 percent confidence intervals, respectively, as defined by risk-neutral probabilities derived from the option prices on 10-year-swap rates.

Figure 8: Projected annual and total interest costs borne by the EU (in EUR billion)



Source: Bruegel based on Danske Bank, Bloomberg and European Commission. Notes: The chart presents historical and projected annual interest rate costs (lines, LHS) and total costs (numbers in bold, RHS) borne by the EU. 50 and 90 percent confidence intervals are based on option implied interest rate volatilities (see notes to Figure 6 and methodology detailed in the Annex). The blue line with triangle markers displays the European Commission's projections from 2021 (https://commission.europa.eu/system/files/2021-01/mff_2021-2027_breakdown_current_prices.pdf).

[26] See details about the methodology, data sources used, and assumptions made to obtain these estimates in the Annex.

terms of maturity structure to lock in low rates when they are available – to minimise interest costs, as sovereigns do. However, in practice, the EU should also change how interest costs are accounted for in the EU budget.

Indeed, given the current inflexible way the MFF and EU budget are constructed (as these have not been thought for expenditures that can fluctuate endogenously), a much higher level of interest costs than the initially planned 14.9 EUR billion will quickly exert pressure on some important EU budget programmes in the coming years. This is because interest costs would compete with other expenditures (European Parliament, 2022, paragraphs 10 and 31-33).

It is true that the significant surge in inflation is resulting in a substantial increase in the gross national income (GNI) of EU countries. Consequently, this will lead to a noteworthy rise in the 'own resources ceiling', enhancing the guarantee on the EU debt provided by EU countries. In nominal terms, the EU can call upon higher contributions from member states if necessary to repay its debt or pay interest. Thus, there is no concern about the EU defaulting on its financial commitments. However, at the same time, the current inflation surge does not increase the 'expenditure ceilings', as these are capped at 2018 prices plus a fixed annual growth rate of 2 percent to account for inflation (EU, 2020, Article 4.2). This means that a large increase in interest payments, such as the one that we project, could quickly exhaust funds at the expense of EU programmes that are located under the same expenditure category, or 'heading' in the EU budget jargon (e.g., Erasmus+ or the European Social Fund+)[27].

Policy recommendations and concluding remarks

There are circumstantial drivers behind the increase in EU yields that took place in 2022: firstly, the surge in inflation which led to the sharpest monetary tightening since the creation of the ECB, and secondly, a divergence between euro-denominated swaps and German bunds which led to a stronger increase in EU yields than in EGBs yields because EU yields are more correlated with swaps than with German yields. As far as the first one is concerned, the EU cannot do anything about it and will have to learn to live with the cyclical nature of interest rate movements. However, in our view, the second one is more problematic as it highlights that the EU is not yet considered fully as a provider of safe assets. This means that even if the German-swap spread declines to its 2021 level, because temporary drivers of the divergence would fade, and bring back EU yields lower, the underlying problem would persist and could come back during future stress episodes.

Therefore to reduce borrowing costs and bring back EU yields towards German yields in a permanent way, in order to reap the full benefits of EU borrowing (because if EU debt is more expensive than what countries can obtain by themselves it will not be are attractive to them), the EU will have some work to do to convince markets that EU bonds should be traded in the same way as sovereigns[28].

Our **main recommendations** are the following:

1. The **issuance strategy of the European Commission** can still be improved to reduce EU borrowing costs at the margin: the Commission should quickly **increase the share of auctions** and limit its usage of syndicated transactions to reduce the bargaining power of its primary dealers and obtain better prices for the EU debt. At the very least, the Commission should be more aggressive in terms of prices in its syndicated transactions. Moreover, to increase the liquidity of its bonds, the EU might also focus first on building a **very liquid short-**

[27] This issue comes on top of the more general problem that in real terms the EU budget is already reduced because inflation has been much higher than the 2% level that is used every year to transform agreed amounts in 2018 prices into current prices.

[28] The convention of pricing EU bonds against swaps could evolve. It made sense for EIB, ESM and other SSAs who have a balance sheet and need to manage their balance sheet risks with swaps, but this is not the case for the EU, which does not have a balance sheet nor exactly a lending book, and is already more like a sovereign in that regard, with cash flows coming from indirect taxation.

term end of the yield curve (to attract more trading) instead of scattering its issuances all over the yield curve, including in very long-term maturity.

2. The European Commission should continue to work on **building market infrastructures** for EU bonds to increase their appeal for investors. There are already various worthwhile initiatives in the pipeline that have been announced in December 2022 when the Commission introduced its unified funding strategy (electronic quotes, repo facility, etc.). In addition, the Commission should continue trying to convince index providers to include EU bonds in sovereign bond indices which would increase its investor base and the overall demand for EU bonds drastically, and to develop a futures market which would increase the number of trades taking place and thus the liquidity of EU bonds.
3. However, the last element shows that changes in market features will have to go hand in hand with some institutional development: to be considered as a sovereign, and to benefit from the safe asset status of a highly rated sovereign, **the EU probably needs sovereign features** such as taxation power. The EU as an issuer is currently trapped between SSA and sovereign status. The spread widening in 2022 and results from investors' survey (Eichert *et al.*, 2022) suggest that, after a strong start, the EU might be sliding back towards the SSA status. **Technical market developments will thus not be enough** (and might not even be possible if there is no institutional progress) to escape this trap. If EU countries want to reap the full benefits of EU borrowing, some political progress will have to take place. The discussion on the creation of new own resources to repay the EU debt scheduled for the autumn of 2023 will therefore be critical. The **development of 'direct taxing powers'** would greatly help from a symbolic perspective, as well as in practice, as it would be a great argument to be included in sovereign bond indices. As far as member states are concerned, it is counterproductive to repeat that EU debt is not permanent: at the minimum EU borrowing should remain in the EU toolbox for future crises, but could also be beneficial in good times to serve other purposes, for instance to finance European public goods to help solve today's most pressing challenges (climate, defence, R&D in clean tech, etc.)
4. Finally, given the much larger interest costs than initially planned, **the EU should review quickly how interest costs are accounted for in the EU budget and in the MFF** to avoid that this exerts undue pressure on important EU programmes. One solution – the one recommended by the European Parliament (2022) itself – is to use the occasion of the mid-term revision of the MFF scheduled for 2023 to exclude the interest payments' budget line from heading 2b and to count it above the MFF expenditure ceilings. A second solution, while maybe not feasible in the immediate future, that should be given serious consideration is a comprehensive review and modernisation of the excessively intricate and outdated accounting framework of the EU budget[29]. Specifically, eliminating the possible inconsistency between own resources and expenditure ceilings should be prioritised, as the former grows in tandem with actual inflation while the latter grows at a fixed 2% trend. Finally, another, more ambitious, solution is (again) to quickly make some progress and find an agreement on genuine own resources that can be allocated, at least in part, towards debt repayment and interest expenses, as agreed in 2020[30].

[29] Darvas (2019) makes a similar recommendation based on the fact that the accounting framework of the EU is not used by any other country or international institution.

[30] See the joint declaration by the European Parliament, Council and Commission on the treatment of NGEU interest costs and repayments in the 2021-2027 MFF: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020C1222(04)

References

Beck, T., J.-P. Krahnen, P. Martin, F. Mayer, J. Pisani-Ferry, T. Tröger, B. Weder di Mauro, N. Véron and J. Zettelmeyer (2022) 'Completing Europe's banking union: economic requirements and legal conditions', Policy Contribution 20/2022, Bruegel, available at: https://www.bruegel.org/policy-brief/completing-europes-banking-union-economic-requirements-and-legal-conditions-0

Bletzinger, T., W. Greif and B. Schwaab (2022) 'Can EU bonds serve as euro-denominated safe assets?', ECB Working Paper n°2712. August. 2022. available at: https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2712~6f023a5df2.mt.pdf

Bonfanti, G. and L. Garicano (2022) 'Do financial markets consider European common debt a safe asset?', Bruegel blog, 8 December 2022, available at: https://www.bruegel.org/blog-post/do-financial-markets-consider-european-common-debt-safe-asset

Caballero, R., E. Farhi, and P-.O. Gourinchas (2017) 'The safe assets shortage conundrum'. *Journal of economic perspectives*, *31*(3), 29-46, available at: https://pubs.aeaweb.org/doi/pdf/10.1257/jep.31.3.29

Christie, R., G. Claeys, and P. Weil (2021) 'Next Generation EU borrowing: a first assessment', In-Depth Analysis prepared for the European Parliament's Committee on Budgets (BUDG), available at: https://www.europarl.europa.eu/thinktank/en/document/IPOL_IDA(2021)699811

Claeys, G. (2023) 'Finding the Right Balance (Sheet): Quantitative Tightening in the Euro Area', prepared for the Economic and Monetary Affairs Committee (ECON) of the European Parliament, available at: https://www.europarl.europa.eu/cmsdata/267599/Final_CLAEYS.pdf

Dalla Fontana, S., M. Holz auf der Heide, L. Pelizzon and M. Scheicher (2019) 'The anatomy of the euro area interest rate swap market'. ECB Working Paper Series. No 2242. European Central Bank, available at: https://www.ecb.europa.eu/pub/pdf/scpwps/ecb.wp2242~b1f459eb90.en.pdf

Darvas, Z. (2019) 'Memo to the commissioner responsible for the European Union budget', in M. Demertzis and G.B. Wolff (eds) Braver, greener, fairer: Memos to the EU leadership 2019-2024, Bruegel, available at: https://www.bruegel.org/sites/default/files/wp_attachments/BRAVER-GREENER-FAIRER_Memos2019_1.pdf

ECB (2022) 'ECB reviews its risk control framework for credit operations', Press release, 20 December 2022, available at: https://www.ecb.europa.eu/press/pr/date/2022/html/ecb.pr221220_1~ca6ca2cc09.en.html

Eichert, F., L. Harreau, and V. Tanguy (2022) 'EU investor survey 3.0: stuck in transition', Credit Agricole CIB Research, SSA Focus, 16 November 2022, available at: https://research.ca-cib.com/article/details/172e71e4-518c-4035-9433-bf125f0f11ec

Eichert, F., and V. Tanguy (2023a) 'Impossible is nothing (but it will still be hard): EU pushing for inclusion in sovereign bond indices according to Reuters', Credit Agricole CIB Research, SSA Focus, 4 May 2023, available at: https://research.ca-cib.com/article/details/ccd5c8ad-448c-451e-b743-618480496388

Eichert, F., and V. Tanguy (2023b) 'NGEU disbursement tool', Credit Agricole CIB Research, SSA Focus, 14 April 2023, available at: https://research.ca-cib.com/article/details/d667a04c-91bd-4931-85a6-968b66a0469f

EU (2020) 'Council Regulation (EU, Euratom) 2020/2093 of 17 December 2020 laying down the multiannual financial framework for the years 2021 to 2027', available at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=uriserv%3AOJ.LI.2020.433.01.0011.01.ENG

EU (2022) 'Regulation 2022/2434 (EU, Euratom) of the European Parliament and of the Council of 6 December 2022 amending Regulation (EU, Euratom) 2018/1046 as regards the establishment of a diversified funding strategy as a general borrowing method', available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32022R2434&from=EN

European Commission (2021) 'Semi-annual report on the execution of the NextGenerationEU funding operations pursuant to Article 12 of Commission Implementing Decision', Report C(2021)2502, available at: https://commission.europa.eu/system/files/2022-02/com_2022_43_1_en_act_part1_v6.pdf

European Commission (2022a) 'Half-yearly report on the implementation of borrowing, debt management and related lending operations pursuant to Article 12 of Commission Implementing Decision', Report C(2022)9700, available at: https://commission.europa.eu/system/files/2023-02/COM_2023_93_F1_REPORT_FROM_COMMISSION_EN.PDF

European Commission (2022b) 'Funding Plan January-June 2023', available at: https://commission.europa.eu/system/files/2022-12/Factsheet_Funding%20Plan_January-June%202023_19dec_1.pdf

European Parliament (2022) 'Resolution on upscaling the 2021-2027 Multiannual Financial Framework: a resilient EU budget fit for new challenges', 2022/2046 (INI), 15 December 2022, available at: https://www.europarl.europa.eu/doceo/document/TA-9-2022-0450_EN.pdf

ICMA (2023) 'The European repo market at 2022 year-end', ICMA European Repo and Collateral Council (ERCC) Briefing Note, January 2023, available at: https://www.icmagroup.org/assets/ICMA-European-Repo-Market-2022-brochure-January-2023.pdf

Kraemer, M. (2023) 'EU bonds have not lived up to high expectations', Opinion, Financial Times, 18 April 2023, available at: https://www.ft.com/content/dc82d584-4961-4af3-ab32-eb504bb3e375

Kreicher, L. and R. McCauley and P. Wooldridge (2017) 'The bond benchmark continues to tip to swaps'. BIS Quarterly Review, Bank for International Settlements. March. pp 69-79, available at: https://www.bis.org/publ/qtrpdf/r_qt1703h.pdf

Remolona, E., and P. Wooldridge (2003) 'The euro interest rate swap market', BIS Quarterly Review, Bank for International Settlements. March. pp 47-56. available at: https://www.bis.org/publ/qtrpdf/r_qt0303f.pdf

Zettelmeyer, J., G. Claeys. Z. Darvas. L. Welslau and S. Zenios (2023) 'The longer-term fiscal challenges facing the European Union' Policy Brief 10/2023. Bruegel, available at: https://www.bruegel.org/policy-brief/longer-term-fiscal-challenges-facing-european-union

Annex

Methodology to derive projections of interest costs that will be borne by the EU

Projections of future interest costs that will be borne by the EU are calculated by combining data on the EU's current debt stock with estimates of future financing needs, the original maturity structure of current debt and market expectations for future interest rates.

We use European Commission transaction data and press releases to identify historical interest costs for bills and for bonds that are designated to NGEU, ie the only program with non-repayable components. Since interest costs of some NGEU bonds are borne by member states, we adjust the size of historical coupon payments by the non-repayable share of allocated NGEU funds as reported in the European Commission's reports on the implementation of borrowing, debt management and related lending operations (European Commission, 2021, 2022a). Because bonds issued under the unified funding strategy which started in January in 2023 are not assigned to specific programs, we adjust the related coupon payments by the share of NGEU in total borrowing as put forward in the European Commission's December 2022 Funding Plan (European Commission, 2022b), before correcting by the share of non-repayable financing in outstanding disbursements as of December 2022 (calculated based on European Commission, 2022a).

Outstanding borrowing needs in 2023 as well as borrowing needs for the following years are based on estimates for outstanding disbursements of NGEU grants and rollover costs of existing and future debt. We assume equal disbursement of outstanding non-repayable program support until the end of 2024 and equal disbursement of outstanding RRF grants until the end of 2026. Borrowing needs are met by taking up new debt according to the original maturity profile of the current debt stock. Interest rates are based on forward swap data for each projection year and respective maturities, corrected by the one-year average spread between Euro swaps and generic EU bonds from May 2022 to April 2023. We use forwards of 3 months, 6 months, as well as 1-, 2-, 3-, 4-, 5-, 10-, 15-, 20-, 25-, and 30-year swaps, correcting each by the spread with respective EU generic bonds and linearly interpolating missing rates along the yield curve. Robustness checks for alternative borrowing scenarios based on projections for grant disbursements by Eichert and Tanguy (2023b) result in marginal increases in projected interest costs (baseline total interest costs amount to 32.4 EU billion, with a 50 percent range between 27.4 and 28.8 EUR billion, and a 90% range between 15.8 and 52.2 EUR billion).

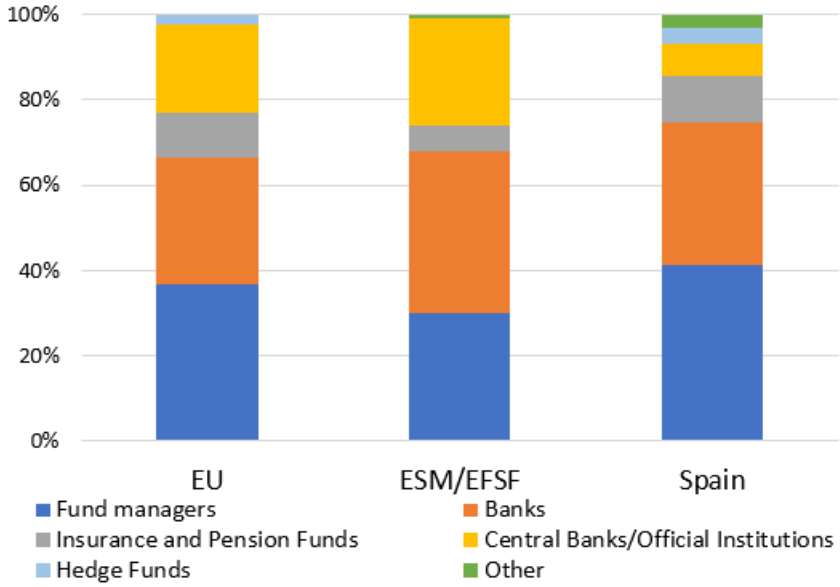
50 and 90 percent confidence intervals are based on market expectations. Specifically, we use the implied volatilities of option prices for Euro swaps of various maturities to derive upper and lower bounds for respective forward rates and repeat the projection described above for each bound.

Table A1: EU borrowing from June 2020 to April 2023

Issuance Type	Number	Average volume per issuance (in EUR billion)	Average Cover Ratio
Bill auctions	72	1.317	2.2
NGEU bond syndications[1]	15	7.267	9.2
NGEU bond auctions[1]	11	2.486	1.7
NGEU green bond syndications	5	7.0	10
NGEU green bond auctions	4	1.862	1.8
SURE social bond syndications	14	7.025	9
EU bond syndications[2]	5	5.0	11
EU bond auctions[2]	9	1.909	1.8
MFA syndications	8	0.9	10.4
EFSM syndications	3	3.983	9.1

Source: Bruegel based on European Commission. Note: (1) NGEU bonds refer to bonds issued between June 2021 and December 2022 explicitly for the purpose of financing NGEU payments. (2) EU bonds refer to bonds issued by the Commission under the unified funding strategy since January 2023. In instances where multiple streams were financed with one issuance, we treat each as a separate issuance, splitting the volumes by their funding purpose and assigning both the same cover ratio.

Figure A1: Distribution of debt by investor type



Source: Bruegel based on European Commission and ESM Investor Presentations and Tesoro Público of Spain Chart Pack. Notes: This represents the distribution of investor type based on syndications, not auctions. EU is based on bond syndications from January 2020 to end of February 2023. ESM/EFSF includes all EFSF & ESM syndicated bond issues as at 22/02/2023. Spain is a weighted average of the four syndications that took place in 2022. For consistency across issuers, 'Banks' includes the categories 'Bank Treasuries' and 'Other Banks' reported by the Commission and Spain. The ESM/AFSF do not report 'Hedge Funds' as a distinct category.

Table A2: Main characteristics of EU bonds and comparable issuers

	EU	Germany	France	Spain	EIB	ESM/EFSF
Median credit rating	AAA	AAA	AA	A-	AAA	AAA/AA
Issuance volume 2022, EUR bn	176.6	448.75	595.17	232.57	44.22	58.06
Share of 2022 issuance by auction (A) and syndication (S)	A: 49% S: 51%	A: 96% S: 4%	A: 98% S: 2%	A: 87% S: 13%	A: 0% S: 100%	N/A
Total outstanding debt (EUR billion)	398.61	1,758.95	2,328.96	1,325.34	443.75	299.38
Average cover ratio in 2022 auctions (A) / syndications (S)	A: 1.85 S: 9.63	A: 1.9 S: N/A	A: 3.07 S: N/A	A: 2.15 S: 7.05	N/A	4.2
Average volume per 2022 issuance, EUR billion	A: 1.493 S: 4.773	A: 2.859 S: 4.250	A: 2.160 S: 4.000	A: 1.689 S: 7.500	S: 0.970	1.529
Haircut category at ECB	I (from 29 June 2023, before II)	I	I	I	II	II
Haircut on 10-year bonds in CCPs (LCH Ltd and LCH SA)	6.50% 8.00%	2.75% 3.50%	2.88% 3.75%	11.38% 12.25%	6.50% 8.00%	6.50% 4.5/8.0%
Share of collateral posted in European repo market	<0.2%*	12.5%	15.8%	4.8%	<0.2%*	<0.2%*
Liquidity indicators, 2022: - Average bid-ask spread - Average daily volume of trades, EUR billion	1.35 1.165	0.65 12.800	0.62 12.733	1.05 5.040	2.37 0.703	3.12/1.96 0.119/0.274
Example of bond indices inclusion (Sovereign or Quasi)	S&P Eurozone Quasi & Foreign Government Bond Index	S&P Eurozone Sovereign Bond Index	S&P Eurozone Sovereign Bond Index	S&P Eurozone Sovereign Bond Index	S&P Eurozone Quasi & Foreign Government Bond Index	S&P Eurozone Quasi & Foreign Government Bond Index
Existence of (i) futures market and (ii) repo facility	No In process	Yes Yes	Yes Yes	Yes Yes	No No	No Not active but possible
Obligations/incentives for primary dealers: - Participation in issuances - Quotation on electronic platforms/trading facilities - Active participation in secondary market	Yes In process Yes	Yes No No	Yes Yes Yes	Yes Yes Yes	N/A	Yes No No

Source: Bruegel based on European Commission, Deutsche Finanzagentur, Agence France Trésor, Tesoro Público of Spain, ESM, EIB, Moody's, Fitch, S&P, DBRS, ECB, International Capital Markets Association (ICMA), Bloomberg, S&P Dow Jones, LCH Ltd, LCH SA. Notes: Data as of April 30th, 2023. The credit rating reflects the median of those issued by Moody's, Fitch, DBRS and S&P, in S&P terms. The share of issuance by auction and syndication is in terms of volume of overall issuance, not number of issuances. Total outstanding debt comes from national authorities where possible, or from Bloomberg. For Germany, this refers to Federal Debt. The average volume per issuance for the EIB refers to their issuances in EUR, which made up 53% of their issuance in 2022. The ECB announced in December 2022 that debt instruments issued by the European Union would be re-assigned from haircut category II to haircut category, but this will only take effect from 29 June 2023. * The data on the share of the use of the different issuers' securities as collateral in the European repo market comes from the ICMA European Repo Market Survey 44 (available at:

https://www.icmagroup.org/market-practice-and-regulatory-policy/repo-and-collateral-markets/market-data/icma-repo-survey/), which groups the EU, EFSF, ESM, EFSM and EIB as 'EU issuers'. The total share of the use of securities from these issuers as collateral in this market is 0.2%, but we lack further granularity. The bid-ask spreads referenced under liquidity are on 10-year benchmark bonds. For simplicity, we considered only the S&P Dow Jones Bond Indices, but this is representative across other providers- SSA bonds are not included in these indices. The European Commission has announced that it will initiate work on a repo facility in 2023 for completion by 2024.

Administrator responsible: Alix DELASNERIE, Francisco PADILLA OLIVARES Editorial assistant: Adrienn BORKA
Contact: Poldep-Budg@ep.europa.eu