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DEBT ISSUANCE BY the European Commission on behalf of the European Union has increased massively. Of the approximately €400 billion in outstanding EU debt as of May 2023, 85 percent has arisen from borrowing since 2020. Large-scale borrowing is expected to continue until 2026 to fund the remainder of NextGenerationEU, and concessional loans to support Ukraine.

WHEN THESE PROGRAMMES were launched, interest rates were at historic lows – even negative for maturities below 10 years. However, interest rates rose sharply in 2022. Beyond the widespread rise in euro-denominated interest rates due to monetary tightening by the European Central Bank in response to the inflation surge, the EU has also faced a widening of the spread between its yields and those of major European issuers, including France and Germany. This widening is driven by a combination of market 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 to try to narrow the spread with major European sovereigns by further developing the relevant market infrastructure and improving its issuance strategy. The Commission will not be able to do this alone. Institutional developments, including progress on the development of new 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 EU borrowing (around €421 billion in total by the end of 2026, in current prices) is intended to finance unprecedented non-repayable support: Recovery and



Figure 1: Issuance and outstanding debt of the EU (in € billions)

Source: Bloomberg, Bloomberg and EY, Capital Markets, Note: Data as of 30 April 2023; EU debt, credit deposits, and deposits of the financial sector, MFA, BIP, EFSM, NGEU, and SURE (in trillions of euros).

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

When the EU started large-scale borrowing operations, in 2020 for SURE and 2021 for NGEU, interest rates in Europe and in other advanced economies were at historic lows, having been 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 years (Figure 2 and 3). Moreover, at the time, markets expected rates to remain relatively low in the foreseeable future, meaning that when the Commission estimated what borrowing costs would amount to for the whole 2021-27 MFF, they expected a cumulative interest cost of only €14.9 billion up to 2027¹⁰.

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 percent in less than a year (Figure 2 Panel A). Furthermore, 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 Russia's invasion of Ukraine. As of April 2023, the EU yield curve was significantly above the French, and also near or even above the Spanish yield curve for maturities up to 2 years, despite the EU enjoying a much better rating than France or Spain (median ratings of AAA, AA and A-, respectively; see Table A2 in the annex).

Figure 2: Evolution of yields for the EU, France, Germany and Spain (in %)

Source: Bloomberg Finance L.P. N. Euro area, 3 January 2022. Euro area, 11 April 2023. France, 3 January 2022. EU, red

us, two key drivers account for the substantial rise in EU yields in 2022: first, the rapid increase in all euro-denominated short-term rates in 2022 because of the European Central Bank's monetary tightening, and second, and more interestingly, the notable increase in the spread between EU yields and German (and French) yields.

2.1 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 2022 was the tightening of ECB monetary policy to tame inflation. The ECB ended its net asset purchases in the first half of 2022 and then started hiking its policy rates in July 2022. The

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/mif_2021-2027_breakdown_current_prices.pdf.

3 Potential explanations for the widening of the spread in 2022

What factors underlie this rise in the spread between German yields and EU yields? Providing a definitive answer is challenging because 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.

We therefore interviewed a broad range of stakeholders that engage with EU debt on a regular basis and represent diverse perspectives, including traders, fixed-income strategists from leading European banks, asset managers, experts from central counterparty clearing houses (CCPs), national Treasury officials and debt-management office (DMO) officials from EU countries and European institutions. The potential reasons behind the divergence in EU yields that we have compiled through these discussions can be grouped – albeit somewhat arbitrarily, as they are all ultimately interconnected – into three main types of explanation: 1) market features, 2) circumstantial factors, and 3) institutional features.

3.1 Market features: remaining differences between EU and major European government bonds

Even though EU bonds have changed radically in nature and in magnitude with the establishment of SURE and NGEU, there are still major differences compared to European government bonds, in particular with those, such as German or French bonds, that play a benchmark role in European financial markets. This makes EU bonds imperfect substitutes for government 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 resold quickly and easily, 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 currently, and during times of high stress or uncertainty, such as during the geopolitical and 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.

Figure 4: Liquidity of EU, German, French and Spanish bonds

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

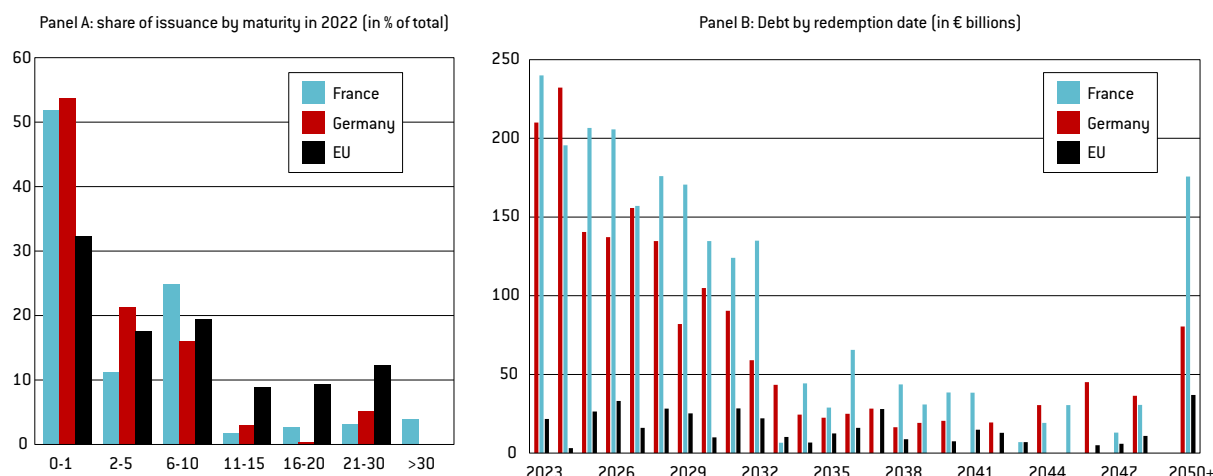
Source: Bloomberg, Bloomberg Intelligence. Panel A: Market average bid-ask spread for 10-year bond futures contracts. Panel B: Market average bid-ask spread for 10-year bond futures contracts.

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 a buyer is willing to pay for an asset and the lowest price 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 has been twice as high as those on French and German bonds, and most of the time higher than for Spanish bonds, indicating much lower liquidity of EU bonds (Figure 4, panel A).

Even if the EU is now considered as a large and frequent issuer that competes with major issuers in the primary market, the amount of EU debt traded daily in the secondary market is still much smaller than the debt of other major European issuers (Figure 4, panel B). This is logical given that the EU's total outstanding debt is still much smaller (eg around €400 billion for the EU vs €2.3 trillion for France; see Table A2 in the annex for other comparable issuers). Moreover, the EU yield curve is still very much in construction: even if the EU is now active along the whole curve up to 30 years (Figure 5, panel A), the outstanding amount of bonds at each point still represents only a small share of Germany or France (Figure 5, panel B). Having a full curve with a significant number of trades at each point helps to boost arbitrage trades and thus overall liquidity.

If liquidity plays a crucial role in the appeal of a particular security, other market features are also seen as highly desirable by investors. Considered crucial by investors is the possibility to post a security as collateral to obtain cash easily and at minimal haircuts. On that front again, EU bonds do not fare well compared to major European issuers. The announcement by the ECB on 20 December 2022¹¹ that it will accept EU bonds as collateral in its monetary operations, with the same haircut as similarly rated sovereigns, starting 29 June 2023, 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 central counterparty clearing houses (CCPs), which are increasingly used to centralise financial transactions, in particular repo operations, eligibility as collateral and the haircuts applied are still different for the EU compared to European government bonds. Haircuts applied to EU bonds by the most important CCPs (LCH, Eurex Clearing, Ice Clear Europe and Euroclear) are much higher than those applied to Germany and France (see the example for a 10-year bond in Table A2 in the annex). Most CCPs 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. In any case, the use of EU bonds as collateral in CCPs remains negligible, especially compared to the use of German and French bonds (see the numbers for collateral in repo operations in Table A2).

Figure 5: Bond issuance by the EU, France and Germany



Source: Bloomberg, Bloomberg, Eurostat, CEPR, and Deutsche Postleitzahl und Ortsnamensverzeichnis. Note: Panel A: Issuance, 2022; Panel B: Scheduled debt, 2023-2050.

11 See ECB press release, 'ECB reviews its risk control framework for credit operations', available at: https://www.ecb.europa.eu/press/pr/date/2022/html/ecb.pr221220_1-ca6ca2cc09.en.html.



More generally, though EU bonds are subject to the same favourable regulatory treatment as the highest-rated European government bonds¹², financial institutions still treat them differently in practice. For instance, in the internal risk models of financial institutions, EU bonds are sometimes considered riskier and are assigned higher risk weights because of 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 portfolios¹³. As EU bonds are not currently part of the most widely used sovereign bond indices¹⁴ – 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 base¹⁵. This is particularly significant given the growing importance of passive investing in recent years.

Other characteristics of EU bonds also hinder their popularity and contribute to the interest rate premium paid by the EU compared to Germany. These characteristics include the absence of a repo facility managed by the EU like that managed by the German DMO to enhance liquidity and avoid temporary scarcity episodes; the absence of futures on EU bonds (which boost trading and liquidity by giving traders some material to build trades); the minimal presence of EU bonds quoted on electronic platforms; and the fragmentation of bonds between the various EU programmes (NGEU, SURE, Green NGEU, MFA, BoP, EFSM), which also reduces the overall liquidity of EU bonds.

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 2023¹⁶. 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 survey on EU bonds (Eichert et al., 2022). When the Commission announced the launch of its unified funding strategy, it also announced other initiatives: work on establishing a repo facility for 2024 to boost liquidity, and the putting in place of a price-quoting commitment for its primary dealers, which should be in place in summer 2023 (see also Table A2 for details on primary dealer obligations)¹⁷.

A last substantial difference between the EU and countries including Germany, France and Spain, is issuance strategy. The EU relies massively more than these countries on syndications than on auctions for its debt issuance: syndicated transactions represented half of the EU debt issued in 2022, while for Germany, France and Spain they only accounted for 4

12 They are considered as a Level 1 High-quality liquid assets in Liquidity Cover Ratio calculations and in capital requirements with 0 percent risk weight for banks under the Basel III framework and no capital charge in solvency requirements for insurance companies in Solvency II.

13 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.

14 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).

15 See the difference in investor base in Figure A2 in the annex.

16 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.LL.2020.433.01.0011.01.ENG>.

17 Source: <https://ec.europa.eu/newsroom/budget/items/770837/en>.

percent, 2 percent and 13 percent respectively (Table A2)¹⁸. It is understandable that, as a new major issuer that needed to establish itself on the market and to build a diverse and stable investor base almost from scratch, the EU preferred to ensure large demand for its debt and to highlight the oversubscription in its first borrowing operations, rather than to minimise costs. Ensuring demand 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 auctions¹⁹ – in which the bargaining power of investors is less – might suggest that the Euro-

Figure 6: Spreads vs Germany and market stress

Source: Bloomberg, Bloomberg Intelligence. Panel A: 10-year Bund yield, EU yield and German swap yield (left). Panel B: 10-year Bund yield, EU yield and German swap yield (right). See also Figure 5 for a

3.2 Circumstantial explanations

One major 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.

German yields have increased relatively less than other euro-denominated interest rates, and especially to swaps, because they have benefited from an increase in risk aversion (see for example the strong correlation between the VIX index, which measures expected volatility in financial markets, and the German-swap spread visible in Figure 6, 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 6).

In addition, the substantial increase in collateral needs resulting from the general increase in volatility in financial markets, and the sizable margin calls²² linked to surging energy prices in the spring and summer of 2022²³, contributed to the high demand for German bonds, exacerbating their already significant scarcity, which resulted from years of ECB quantitative easing. Actually, the peak in the spread between Bunds and swaps/EU yields coincided with the period when concerns about collateral scarcity were most pronounced – October 2022. However, measures taken subsequently by the Deutsche Finanzagentur and the ECB to alleviate collateral scarcity (ICMA, 2023) coincided with a narrowing of the spreads at the end of 2022 and beginning of 2023 (Figure 6, panel A).

On the other hand, swap rates increased more quickly than European government bonds in 2022 because of the high demand for these financial products from financial institutions that needed to hedge 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, which, given the benchmark role swap rates play for EU yields, led to an increase in the Bund-EU spread too.

²² 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.

²³ As noted by the European Systemic Risk Board in a 20 March 2023 letter (https://www.esrb.europa.eu/pub/pdf/other/esrb.letter230320_on_emir_review_mep-058e272ec7.en.pdf). See also Gillian Tett, 'Brussels ignores derivatives at its peril amid energy crisis', *Financial Times*, 8 September 2022, <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.

The end of ECB net asset purchases in the first half of 2022 also acted as a circumstantial driver that contributed to the increase in the spread (Bonfanti and Garicano, 2022). Until then, the bond market was more favourable to borrowers, but with the gradual withdrawal of the ECB as a large buyer, the market shifted to being dominated by lenders. As a result, the spreads versus swaps for all issuers priced against euro-denominated swaps (such as the EIB, the German KfW, the French UNEDIC and CADES, and the EU) experienced a general increase, moving from negative to slightly positive. This shift may have been amplified by the fact that the ECB faced fewer constraints when purchasing supranational bonds, such as EU bonds, as the issuer limit was set at 50 percent, than when buying euro-area government bonds, with a 33 percent limit. Since the ECB was buying a higher proportion of recently issued bonds, it had a greater positive impact on their price than on the price of government bonds. This effect vanished when the ECB halted net purchases (or more precisely when markets started anticipating their end, around the end of 2021), which further contributed to the overall spread increase.

Furthermore, this situation coincided with a time when there was an abundant supply of EU bonds, making it even more challenging for investors to absorb them compared to other SSAs. Consequently, the swap spread increased by a few basis points more for the EU compared to other issuers. However, the impact of the end of the ECB's purchases is not clear cut²⁴, as the higher volume of EU bonds available to market participants should also enhance their liquidity, potentially also partly reducing the yield premium paid by the EU for its lower liquidity.

3.3 Institutional features: the EU is still a net borrower

First, the EU is not supposed to be a permanent player in the bond market. The legal framework of the EU recovery instrument states that the net issuance of EU bonds should conclude at the end of 2026. Thereafter, 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 already today the appeal of the bonds, because they 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.

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 access indirectly member states' resources through GNI-based contributions to the EU budget, it also signals to markets that the EU is fully reliant for its financing on its members and difficult negotiations between them, and is thus different from a sovereign that can resort to taxation very easily and quickly. This is 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).

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

As noted, the EU will borrow a total of €421.1 billion, in current prices, for ‘non-repayable support’ (ie for RRF grants and additional financing of EU programmes) before the end of 2026. The interest costs associated with this borrowing will be serviced through the EU budget³⁰. It is therefore crucial to estimate how these costs could evolve until the end of the 2021-27 MFF.

This estimate will depend 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 for the next few years. Investors expect the 10-year euro swap rate – a good proxy for

the Commission's initial forecasts envisaged annual interest costs increasing slowly towards around €5 billion in 2027 (and overall costs for the whole MFF to be around €15 billion), costs could be twice as large in our baseline scenario, reaching €9.9 billion in 2027 (while total costs would amount to €30 billion, see bold numbers on the right side of Figure 8). As a result, interest costs will represent a significant part of the EU budget: around 5.3 percent of the 2027 annual budget, and 2.5 percent of the whole MFF 2021-27 (Figure A2 in the annex). 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 vary considerably around our baseline estimate: with 50 percent probability, interest costs should be in the €7.8 billion to €12.4 billion range in 2027, while the 90 percent probability interval ranges from 3.2 billion to €18.1 billion, as shown in Figure 8 (see Figure A2 for what these represent as a share of the EU budget).

under the same expenditure category, or ‘heading’ in EU budget jargon (for example, Erasmus+ or the European Social Fund+)³².

5 Policy recommendations and concluding remarks

Circumstances drove the increase in EU yields in 2022. First, the surge in inflation led to the sharpest monetary tightening since the creation of the ECB, and second, a divergence between euro-denominated swaps and German bunds led to a stronger increase in EU yields than in European government bond yields because EU yields are more correlated with swaps than with German yields. As far as the first circumstance 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, the second circumstance is more problematic as it shows that the EU is not yet accepted fully as a provider of safe assets. Even if the German-swap spread declines to its 2021 level, because temporary drivers of the divergence 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 as attractive to them), the EU must convince markets that EU bonds should be traded in the same way as sovereigns³³.

Our main recommendations are:

1. The European Commission’s issuance strategy can still be improved to reduce EU borrowing costs at the margin: the Commission should gradually 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 EU debt. At the very least, the Commission could be slightly 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-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, 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 CCPs to put haircuts at the same level as similarly-rated sovereign bonds and index providers to include EU bonds in sovereign bond indices. This would increase drastically the EU’s investor base and the overall demand for EU bonds. The Commission should also try to develop a futures market which would increase the number of trades taking place and thus the liquidity of EU bonds.
3. However, to work, 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.

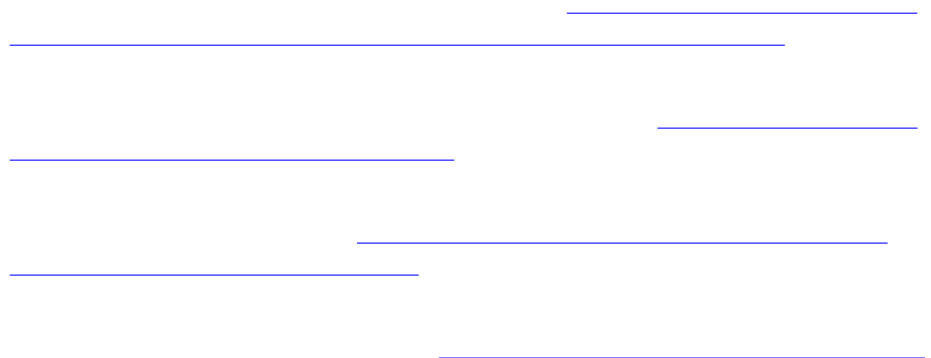
³² This issue comes on top of the more general problem that in real terms the EU budget is already reduced because inflation has been much higher than the 2% level used every year to transform agreed amounts in 2018 prices into current prices.

³³ The convention of pricing EU bonds against swaps could evolve. It made sense for the EIB, ESM and other SSAs that 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.

EU as an issuer is currently trapped between SSA and sovereign status. The spread widening of 2022 and results from investors' surveys (Eichengreen 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 help greatly from a symbolic perspective, as well as in practice, as it would be a great argument supporting inclusion in sovereign bond indices. As far as EU countries 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, including climate change, defence and R&D in clean tech.

4. Finally, given the much higher interest costs than initially planned, the EU should quickly

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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 of future interest rates.

We use European Commission transaction data and press releases to identify historical interest costs for bills and for bonds that are attributed to NGEU, ie the only programme with non-repayable components. Since interest costs of some NGEU bonds are borne by EU countries, 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 programmes, 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).

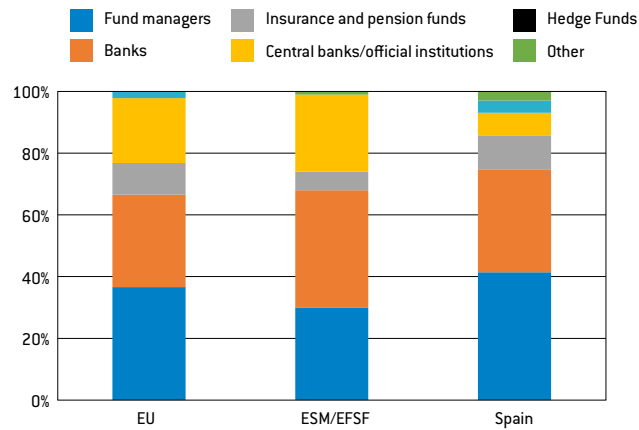
Outstanding borrowing needs in 2023 and borrowing needs for the subsequent years are based on estimates for outstanding disbursements of NGEU grants and rollover costs of existing and future debt. We assume equal disbursement of outstanding non-repayable programme support until the end of 2024 and equal 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 adjusted (e)og0 aanespcalceasedur

Table A1: EU borrowing from June 2020 to April 2023

Issuance type	Number	Average volume per issuance (in € billions)	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: Bloomberg, European Central Bank. Note: (1) NGEU bond refer to bond issued between June 2021 and December 2022 for the first time in the NGEU auctions. (2) EU bond refer to bond issued by EC between January 2020 and December 2022. Last date of the data is the effective date of the issuance, therefore it is a date after the date of the issuance.

Figure A1: Distribution of debt by investor type

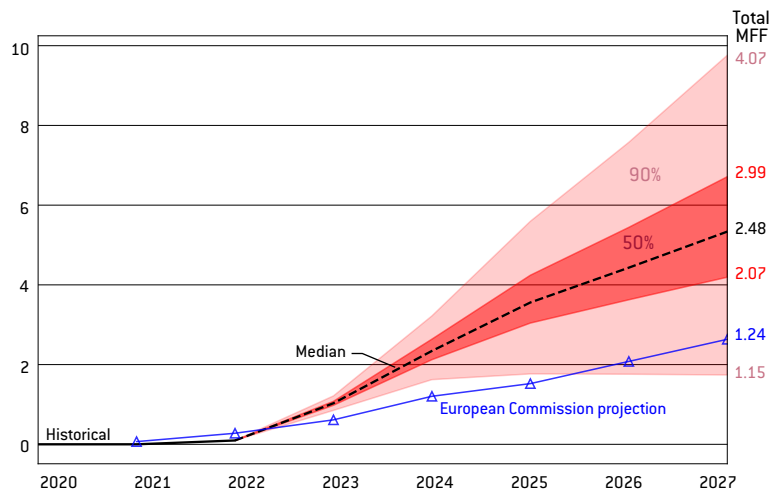


Source: Bloomberg, European Central Bank and ESM. Note: The data is based on the data of the EU bond issued from January 2020 to February 2023. ESM/EFSF, data is based on ESM issued from January 2022 to February 2023. Spain data is based on the data of the Spanish bond issued from January 2020 to February 2023. The data is based on the data of the Spanish bond issued from January 2020 to February 2023. The data is based on the data of the Spanish bond issued from January 2020 to February 2023.

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, € bns	176.6	448.75	595.17	232.57	44.22	58.06
Share of 2022 issuance by auction (A) and syndication (S)	A: 50% S: 50%	A: 96% S: 4%	A: 98% S: 2%	A: 87% S: 13%	A: 0% S: 100%	N/A
Total outstanding debt (€ billions)	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, € billions	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 - Average volume (€ trillions)	1.022, () Tj0 -1.444 T00 billions) TS: 7.0d(293 0 Td35.9)Tj-.165 -1.444 Td30325% LvapA)					

Figure A2: Projected annual and total interest costs borne by the EU (in %, as a share of annual EU budgets and of the whole MFF)



Source: Bloomberg, Database, Bloomberg and European Commission. Note: The chart shows the projected annual and total interest costs borne by the EU as a share of the EU budget and of the total MFF. The 50% and 90% confidence intervals are based on the European Commission's projections for the 2021-2027 period. The chart is based on the data provided in the European Commission's report on the 2021-2027 budgetary cycle (see https://ec.europa.eu/economy_finance/files/2021-01/2021-2027_budgetary_cycle_en.pdf).