ROMANIAN ACADEMY
NATIONAL INSTITUTE FOR ECONOMIC RESEARCH

**WORKING PAPERS**

# *POST-PANDEMIC EVOLUTION OF PUBLIC DEBT IN EUROPEAN STATES*

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# POST-PANDEMIC EVOLUTION OF PUBLIC DEBT IN EUROPEAN STATES[1]

DAN CONSTANTIN OLTEANU [2]

**Abstract:** *This study provides a comparative analysis, for the European countries, of how the volume and structure of public debt have evolved during the pandemic and in the following years. We will study the trend of public debt share in government revenues, the dynamics of public debt structure by financial instruments and maturity, the evolution of external and foreign currency public debt, the interest expenditures and the apparent cost of debt. The analyses show a substantial accumulation of debt in the EU27, with an average rate of over 6% in the period 2020-2023. Romania's public debt increased, in nominal terms, more than double between 2019 and 2023. The slope of the debt trend in Romania (rate of over 17% in 2022-2023) is worrying and its perpetuation over the next few years would put pressure, through debt service, on public spending that is already oversized in relation to revenues.*

**Keywords:** *public debt, debt structure, debt trend, debt stabilisation, government financing.*

**JEL**: *H60, H63*

## 1. Introduction

Extensive public spending during the pandemic years, coupled with poor economic performance in the subsequent period, has widened the gap between public expenditure and revenue in European countries, resulting in the accumulation of public debt. As a result, after a slight reduction between 2015 and 2019 in the EU27's public debt as a share of gross domestic product, the ratio rose sharply in 2020, reaching 90% of GDP; the subsequent gradual reduction failed to bring the ratio back to its pre-pandemic level.

In a previous study (Olteanu, 2024), we showed that public social spending rose substantially during the peak of the Covid-19 pandemic – 2020 and 2021 – in both the health and social protection sectors. Subsequently, additional spending was needed to achieve goals related to digitalisation and the green economy, for the defence sector, and to cover energy price increases. Similarly, in low-income countries, social programmes to support/increase the well-being of the population are also based on public borrowing and create vulnerabilities in periods of economic stagnation/contraction, as Larch (2024) points out. On the other hand, Claeys et al. (2023) warn that loans contracted since 2020 have been made during periods of historically low interest rates, but rising interest rates from 2022 onwards will substantially increase the costs associated with debt. In this context, Armendariz et al. (2024) show that the stabilisation of European countries' public debt will depend substantially on the adoption of ambitious fiscal consolidation and sustained economic growth.

Although some economists do not consider it a real danger, Israel (2024) analyses the hidden risks of public debt. These include: inflation generated by financing public deficits[3]; moral hazard[4] created by the fact that the beneficiary of public debt is the government, while its payers are taxpayers; fiscalisation of monetary policy, i.e. its use for fiscal purposes. In addition, in a previous

[1] This is an English version of paper *Evoluția post-pandemie a datoriei publice din statele europene*, Studii Economice 241216, Institutul Național de Cercetări Economice, http://www.studii-economice.ro/2024/seince241216.pdf .

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[3] Studies such as Catão (2003) and Aragaw (2024) empirically demonstrate this relationship.

[4] Moral hazard represents the tendency to increase exposure to risk (by the government, in the case of public debt) when the risk is borne by others (taxpayers).

study (Iancu & Olteanu, 2023), we conducted a theoretical and empirical analysis of the public debt limit, beyond which there is a risk of insolvency – the main danger of public debt.

This study conducts a comparative analysis for European countries of how the volume and structure of public debt have evolved during the pandemic and in the years 2019-2023. The study is structured as follows: in the next section, we present the methodology and statistical data used in the analyses; section 3 presents the evolution of public debt; section 4 presents the dynamics of debt structure, by financial instruments and maturity; section 5 analyses the evolution of debt by financing sources and currency of issue; section 6 presents public debt servicing cost; section 7 summarises the main findings.

## 2. Indicators and data

We will analyse the following statistical indicators for a group of 30 European countries over the period 2019-2023:

- Annual rate of public debt (%);
- Ratio of public debt stock to annual budget revenue (%);
- Public debt expressed in euro per capita and in years of work per capita;
- Structure of public debt by financial instrument (currency and deposits, debt securities and loans);
- Evolution of public debt in the EU (euro) and Romania (lei), by financial instruments;
- Share of public debt – by financial instrument – in annual budget revenue (%);
- Structure of public debt by maturity (%);
- Structure of public debt by source of financing: non-financial companies, financial companies, households and non-profit institutions serving households, rest of the world (%);
- Structure of public debt by currency of issue (%);
- Share of interest payments in annual budget revenue (%);
- Apparent cost of public debt.

Data series used to calculate the indicators are available in the Eurostat database, namely:

- Public debt expressed in national currency and in euro, total and by financial instrument [gov_10dd_edpt1];
- Public debt, national currency, by maturity and source of financing [gov_10dd_ggd];
- Public debt, national currency, by currency of issue [gov_10dd_dcur];
- Apparent cost of public debt, %, [gov_10dd_acd];
- Net annual revenue, expressed in euro [earn_nt_net];
- Total public revenue and interest expenditure, expressed in national currency [gov_10a_main].

The above data series are available up to 2023.

## 3. Evolution of public debt stock, 2019-2023

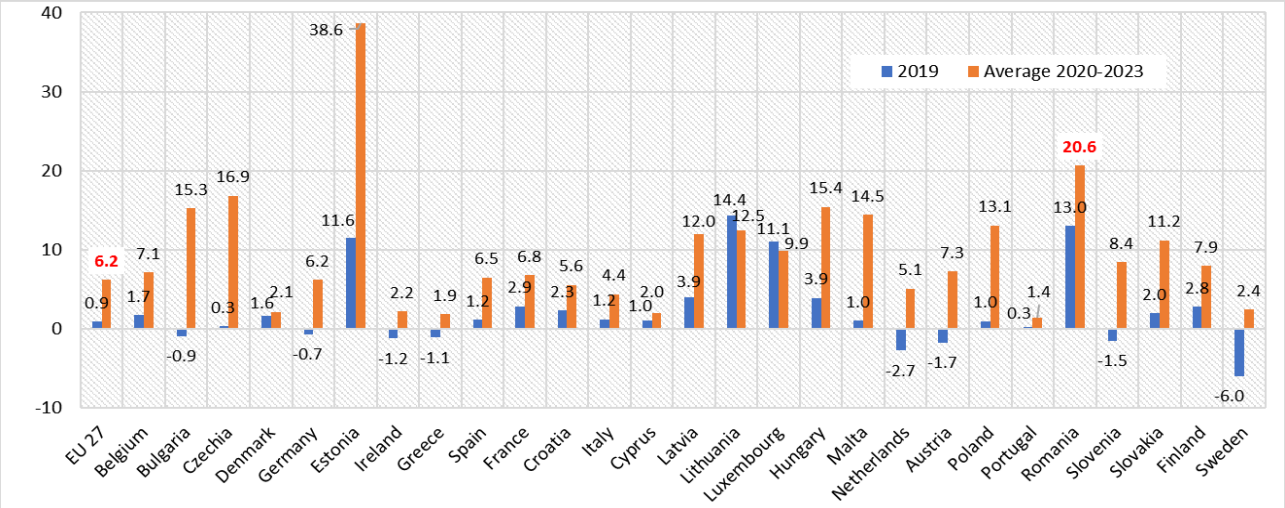
In the following sections, we will present the evolution of the value and structure of public debt between 2019 and 2023. First, the next figure describes the average *annual growth rate of nominal public debt* between 2020 and 2023, compared to 2019. Iceland, Norway and Switzerland are missing due to data unavailability.

The differences between the two periods are evident for all countries considered, with an average debt increase of over 6 p.p. at EU27 level. The most significant increases, above 10 p.p., are found in Estonia (27 p.p.), Bulgaria (16.2 p.p.), the Czech Republic (16.5 p.p.) and Malta (13 p.p.), Poland (12 p.p.) and Hungary (11.5 p.p.). Only two countries recorded negative changes: Lithuania (-1.9 p.p.) and Luxembourg (-1.2 p.p.). The graph shows very high growth rates of over

15% during the pandemic (2020-2023) for public debt in Estonia, Romania (more than triple the EU27 average), the Czech Republic, Hungary and Bulgaria.

**Figure 1**

**Growth rate of nominal public debt[1] (%)**




[1] calculated on the basis of end-of-year stocks, expressed in national currency at current prices.
*Source:* calculations based on Eurostat data, extracted on 02.07.2024.

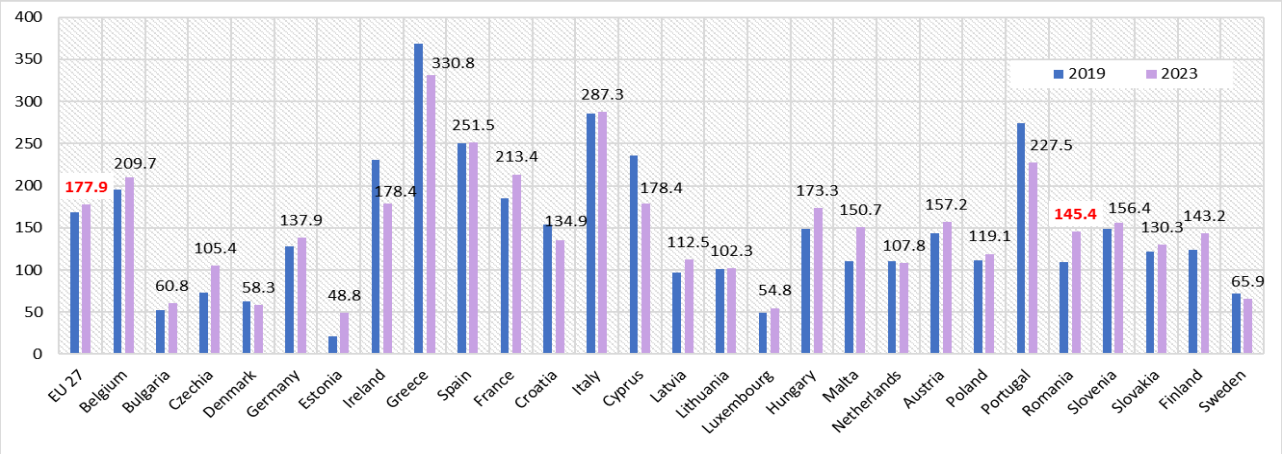
With regard to *the relative size of public debt*, although it is usually reported in relation to gross domestic product, we considered it more appropriate – for the purposes of comparative analysis between countries – to report debt in relation to the annual budget (public revenue), as this provides a more realistic picture of governments' financial capabilities. The share of public revenue in GDP varies considerably among countries; as a result, we consider that GDP is not an accurate measure of the government's ability to repay public debt, and reporting it to GDP does not provide relevant comparisons in terms of indebtedness.

The graph in Figure 2 shows that the debt situation in some countries is worrying at the end of 2023; in economies such as Greece, France, Spain, Italy, Portugal and Belgium, public debt stock in 2023 was more than double annual budget revenue, although most of them (except France and Belgium) reduced their debt ratio between 2019 and 2023. At the other end of the spectrum, in Estonia, Luxembourg and Denmark, debt levels do not exceed 60% of revenue, which is about one-third of the EU27 average.

The evolution of debt ratios also shows divergent trends. Eleven of the 27 countries considered managed to reduce their public debt ratios. The most significant reductions were achieved by Cyprus (-74.2 p.p.), Ireland (-68.9 p.p.) and Portugal (-55.7 p.p.). On the other hand, the most pronounced increases were in Romania (36.8 p.p.) and Malta (36.2 p.p.), while the average increase in the EU27 was only 5.1 p.p. We note that Romania has "recovered" half of the gap with the EU27 average, in terms of the debt-to-revenue ratio; if this growth rate continues, the debt level may rise to risky levels in the coming years.

**Figure 2**

**Ratio between public debt stock and annual budget revenue (%)**




*Note:* values correspond to 2023. *Source:* calculations based on Eurostat data, extracted on 02.07.2024.

With regard to the *indebtedness of population* (ultimate financier of public debt), in Figure 3 we have reported debt, expressed in euro at the exchange rate, to the resident population, and in Figure 4 we have divided this result by the net annual earning of a person; this latter ratio reflects public debt expressed in years of work per capita.

In Figure 3, comparing the debt-per-capita level at the end of 2019 with that at the end of 2023, we note impressive nominal increases in the case of Estonia (201.4%), Romania (105.8%), Bulgaria (91.1%) and the Czech Republic (87.5%), values well above the EU27 average (26.5%); however, we saw in the previous graph that in these countries, the share of debt in public revenue is still below the European average. High levels of public debt per capita are found in developed Western European economies such as Belgium, Ireland, France, Italy and Austria.

Looking at Figure 4, we can see that public debt in the EU27 is equivalent to 1.1 years of work per capita. Values double this average are found in Italy and Greece, while Bulgaria, Denmark and Estonia have levels half the European average.

**Figure 3**

**Public debt, thousand Euro[1] per capita, current prices**

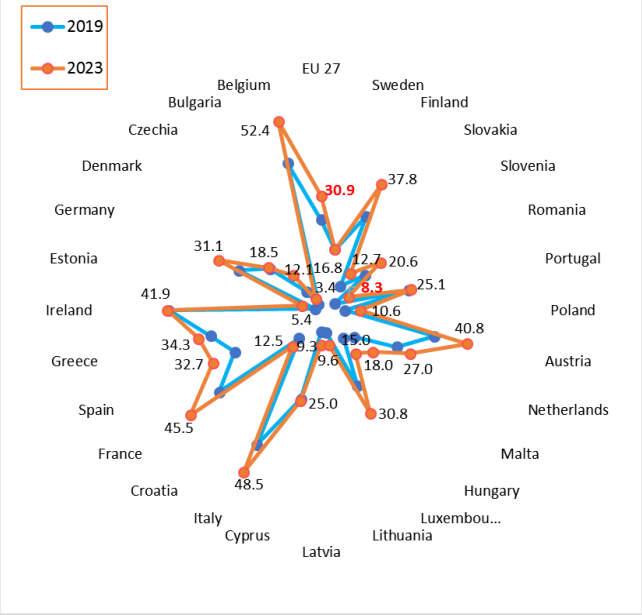
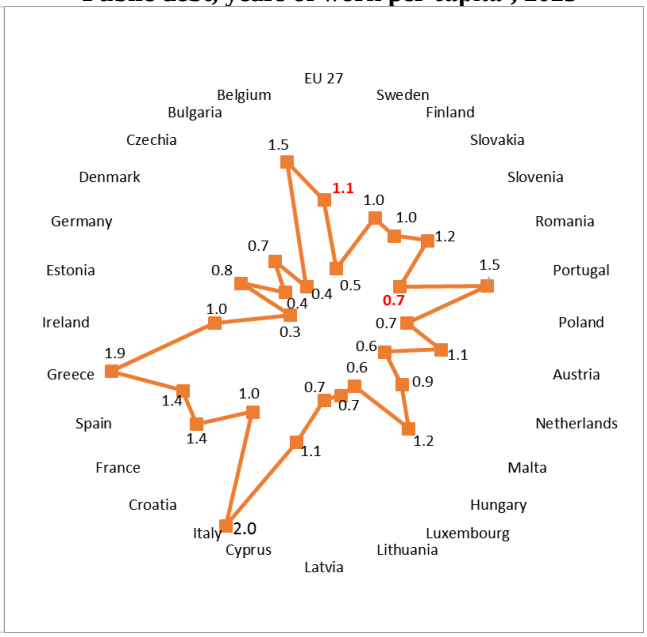



**Figure 4**

**Public debt, years of work per capita[2], 2023**




[1] at exchange rate; [2] obtained by reporting per capita debt to the net annual earning of a single person without children earning 100% of the average earning. *Note*: values correspond to 2023. *Source:* calculations based on Eurostat data, extracted on 02.07.2024.

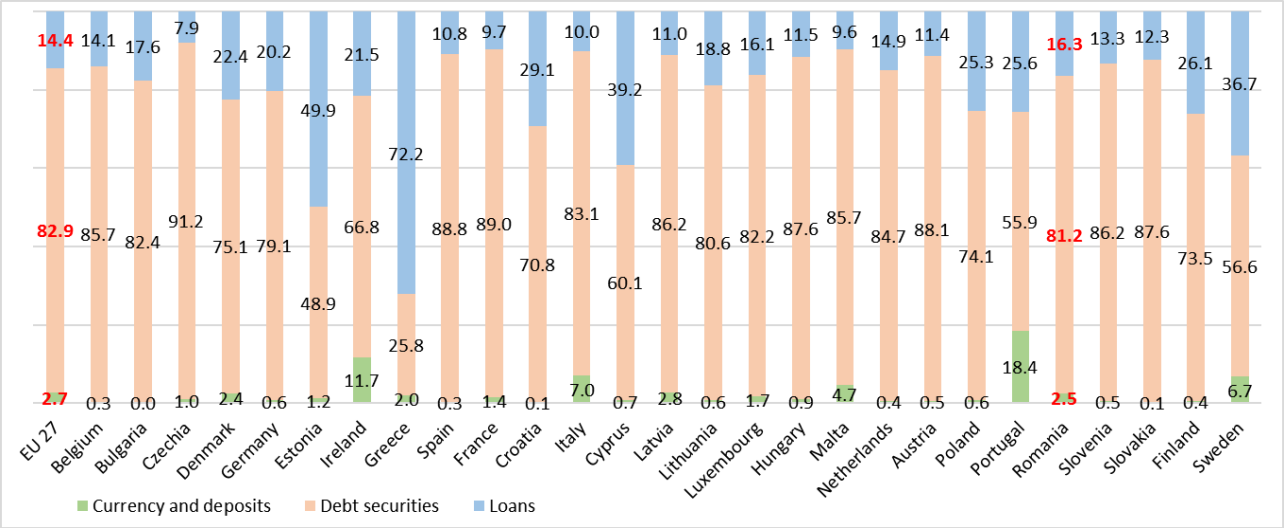
## 4. Structure of public debt, by financial instruments and maturity

We will analyse the evolution of public debt across the three major categories of financial instruments – currency and deposits, debt securities, loans – and by maturity date. First, the following chart summarises the debt structure by financial instruments, at the end of 2023.

Debt securities account for the largest share of public debt at EU level, representing 83% of total debt, followed by loans, with 14.4%. The distribution of financial instruments by country is quite uneven; for example, within debt securities, shares range from 25.8% in Greece and 48.9% in Estonia to a maximum of 91.2% in the Czech Republic. In the case of loans, the values increase from a minimum of 7.9% in the Czech Republic to shares of over 35% in Greece, Estonia, Cyprus and Sweden.

**Figure 5**

**Structure of public debt by financial instruments (%), 2023**




*Source:* calculations based on Eurostat data, extracted on 05.07.2024.

In terms of developments between 2019 and 2023, the changes are not substantial; in the EU27, the share of loans decreased slightly, by 1.8 p.p., while debt securities increased by 2.5 p.p. In Romania, the situation is reversed: the share of loans increased by 2.7 p.p., while debt securities decreased by 2.8 p.p. (due to long-term securities, with a reduction of 3.9 p.p.).

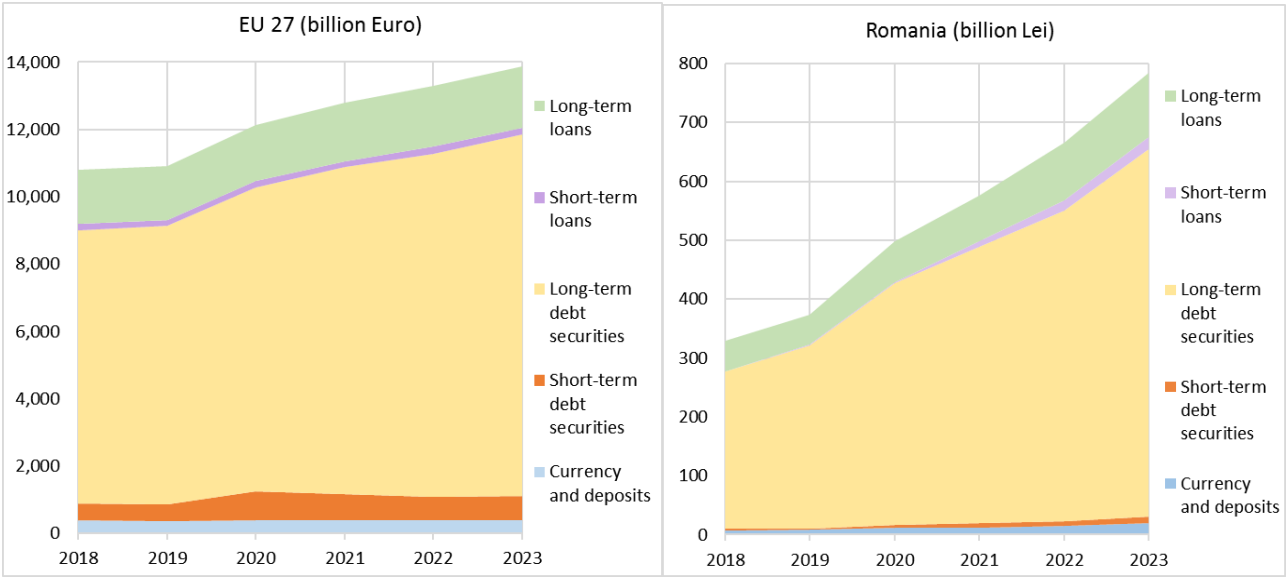
The evolution of public debt in the EU and Romania, by financial instrument and maturity – short (less than 1 year) and long – is summarised in the graphs from Figure 6. There are three inflection points in the debt trends, corresponding to 2019, 2020 and 2022.

After the end of 2019, the trend slopes becomes considerably steeper compared to the initial period 2018-2019; this is the "acute" period of the pandemic, with substantial public borrowing. Subsequently, after 2020, debt growth slows down but remains higher than in the first period. Starting in 2022, we are seeing a third change in the growth slope, which is somewhat more evident in the case of Romania.

Compared to the average increase in the EU27 of only 27%, Romania's public debt increased, in nominal terms (current prices), more than double (110%) between 2019 and 2023, mainly due to the doubling of the main component - long-term debt securities. In relative terms, the increases were much higher for loans and short-term securities, which increased almost 20-fold and almost 9-fold, respectively. The slope of Romania's debt trend (17.7% in 2022-2023) is worrying, and maintaining it in the coming years would put pressure, through debt servicing, on public expenditure, which is already oversized in relation to revenue (budget balance of -19.8% of public revenue in 2023).

**Figure 6**

**Evolution of public debt[1] in the EU and Romania, by financial instruments, 2018-2023**



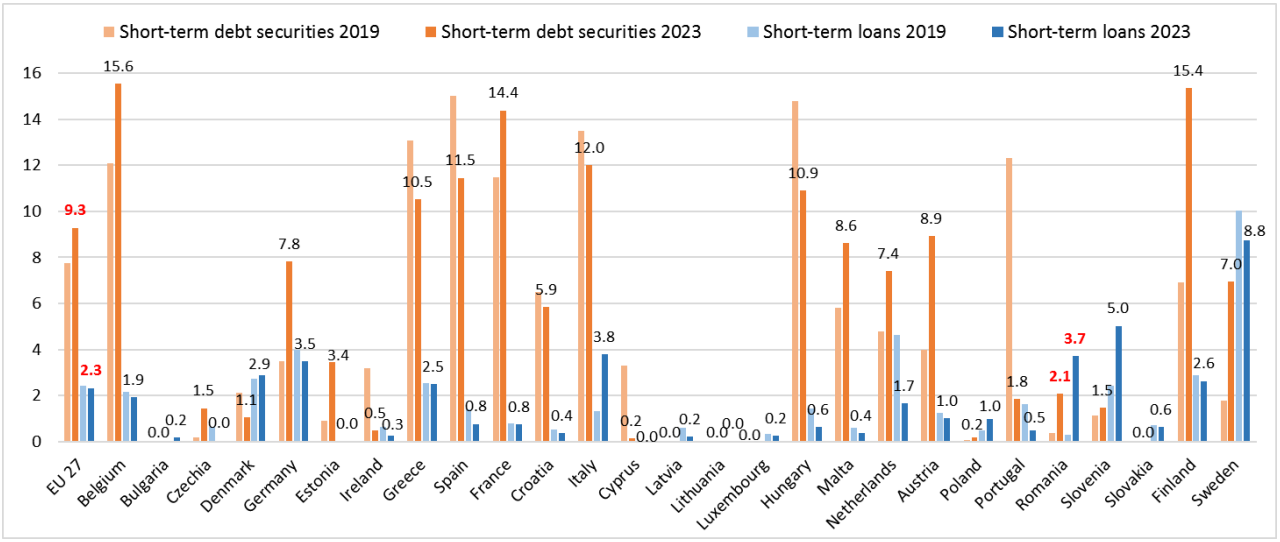

[1] current prices. *Source:* calculations based on Eurostat data, extracted on 05.07.2024.

Figures 7 and 8 show how government debt has evolved for the two main categories of financial instruments – debt securities and loans, which account for over 97% of EU27 debt – structured in turn by maturity. It should be noted that, as short-term debt is a variable that fluctuates widely from one year to the next, comparisons between countries or over time are less relevant.

At EU level, securities account for 9.3% in 2023, while loans are much lower, at only 2.3%. In Romania, short-term debt increased considerably during the period analysed, especially loans, whose share in revenue exceeded the EU27 average in 2023.

**Figure 7**

**Short-term debt securities and loans, % of budget revenue**



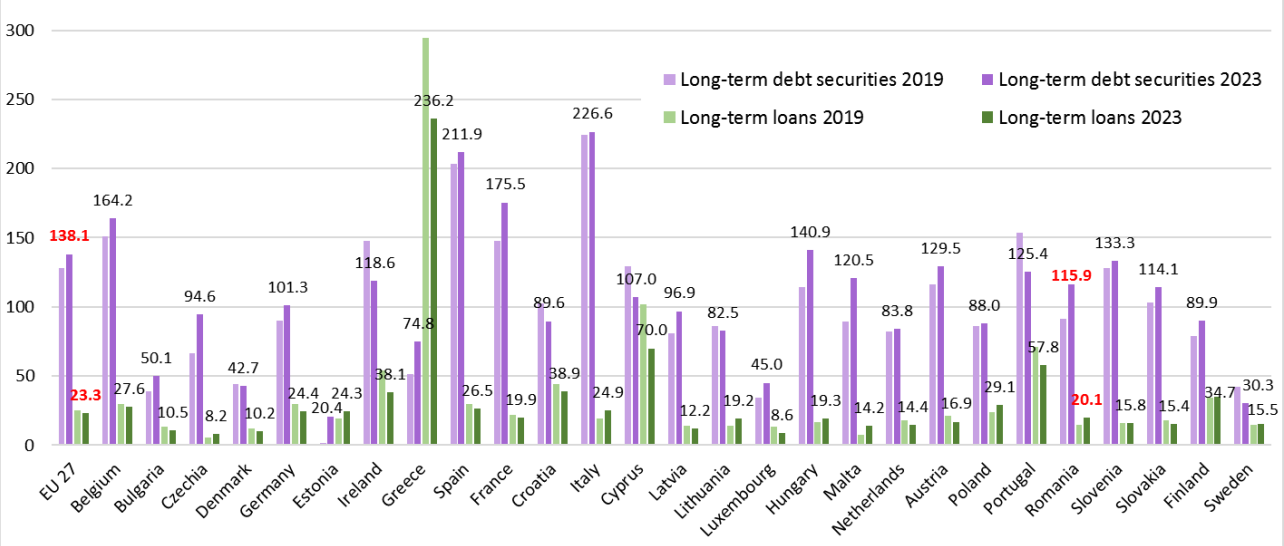

*Note:* values correspond to 2023. *Source*: calculations based on Eurostat data, extracted on 05.07.2024.

The majority of public debt consists of long-term debt securities, which reached 138% of EU27 budget revenues in 2023 (Figure 8). The variation between countries is very pronounced, ranging from levels below 50% in Estonia, Denmark, Luxembourg and Sweden to values above 200% in Spain and Italy. Significant increases between 2019 and 2023 are noticed in the Czech Republic and France (28 p.p.), Hungary (26 p.p.) and Romania (24 p.p.). It is noteworthy that three

countries - Ireland, Portugal and Cyprus - have achieved significant reductions of over 20 p.p. in the share of these financial securities.

**Figure 8**

**Long-term debt securities and loans, % of budget revenue**



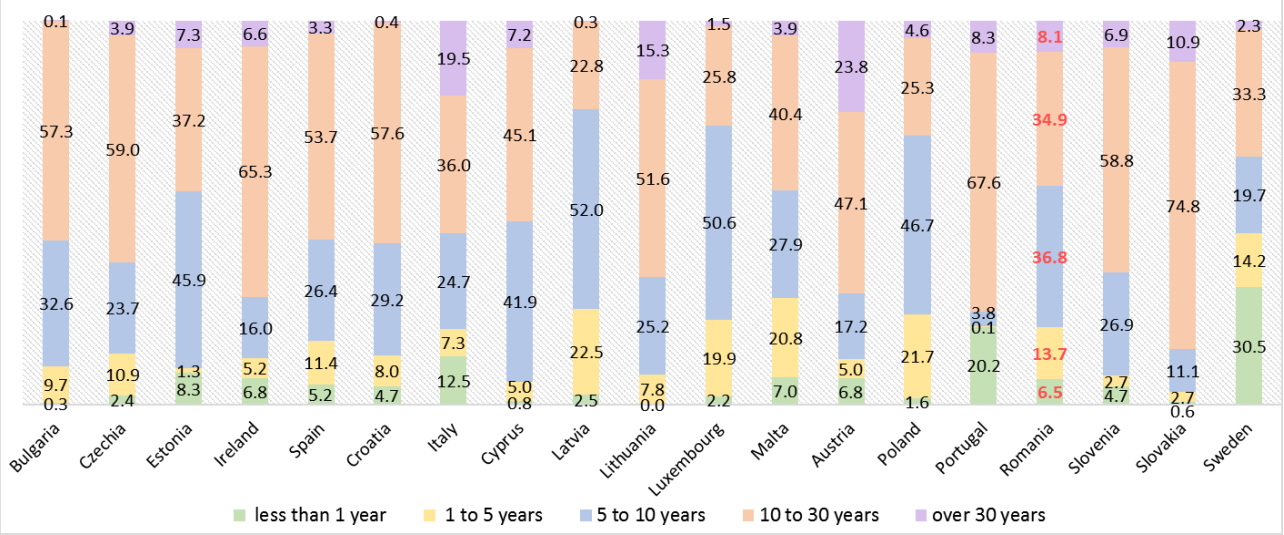

*Note:* values correspond to 2023. *Source:* calculations based on Eurostat data, extracted on 05.07.2024.

Long-term loans account for a much smaller share of revenue, with the exception of Greece, which has managed to significantly reduce their share by 58 p.p., along with Cyprus (-32 p.p.). It is noteworthy that in most (17 out of 27) of the countries, the share of loans has decreased, while only 7 countries have reduced the share of long-term debt securities. Romania remains below the EU average in the analysed period for both categories of long-term debt.

A more detailed analysis of the debt structure by maturity is shown in Figure 9. Relatively short-term debt (<5 years), which involves high interest rates and other costs/risks, is at worrying levels, particularly in Sweden (44.7%), but also in Latvia, Malta, Luxembourg, Poland, Portugal and Romania, with total shares of over 20%.

**Figure 9**

**Structure of public debt by maturity (%)**




*Source:* calculations based on Eurostat data, extracted on 05.07.2024; for missing countries, data is not available.

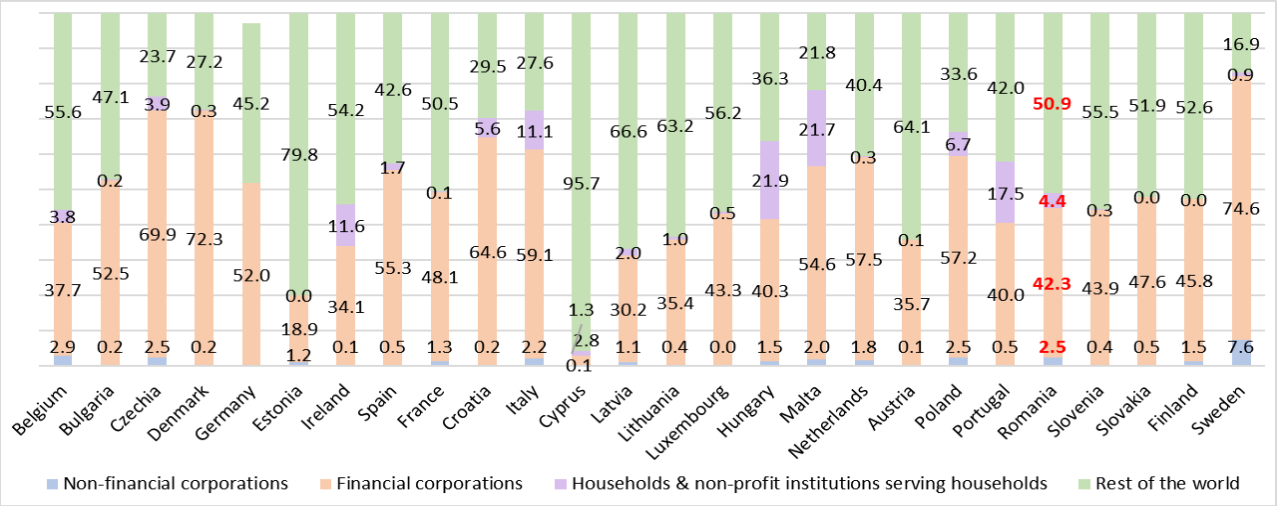
## 5. Debt structure by source of financing; external debt and foreign currency debt

We will now analyse the structure and evolution of public debt broken down by source of financing and currency of issue. Creditors are grouped into four categories: three domestic (financial companies – banks and other institutions –, non-financial companies, households and non-profit institutions serving households) and rest of the world (external public debt). The structure of public debt at the end of 2023, based on these sources, is shown in Figure 10, and in Figure 11 we have calculated the growth rates of the two main components: domestic financial companies and external creditors.

A high level of public debt, especially external debt, can negatively affect a country's rating and, more importantly, the financing conditions (interest rates, etc.) for future loans. At the same time, for loans in foreign currency, there is a risk of domestic currency devaluation, which increases the value of debt servicing. High levels (over 50%) of external creditors are observed in half of the 26 countries considered, namely: Belgium, Ireland, France, Cyprus (96%, up 14 p.p. from 2020), the Baltic countries, Luxembourg, Austria, Romania, Slovenia, Slovakia and Finland. On the other hand, in the case of domestic sources, financial institutions account for the majority share, reaching levels of over 70% of total debt in Denmark and Sweden.

**Figure 10**

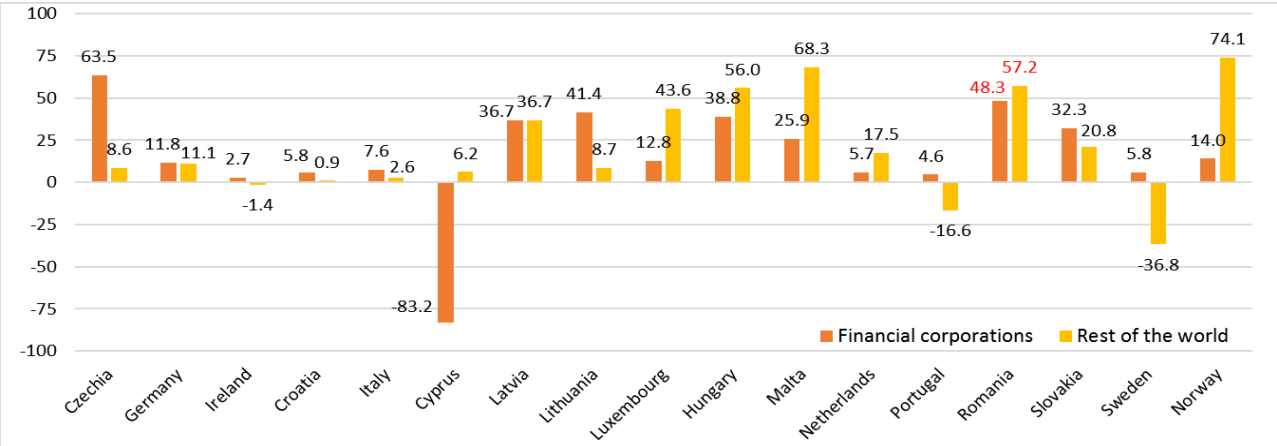
**Structure of public debt by source of financing, 2023 (%)**




*Source:* calculations based on Eurostat data, extracted on 31.07.2024.

**Figure 11**

**Change in public debt, 2023/2020[1] (%), by source of financing (financial companies and external)**



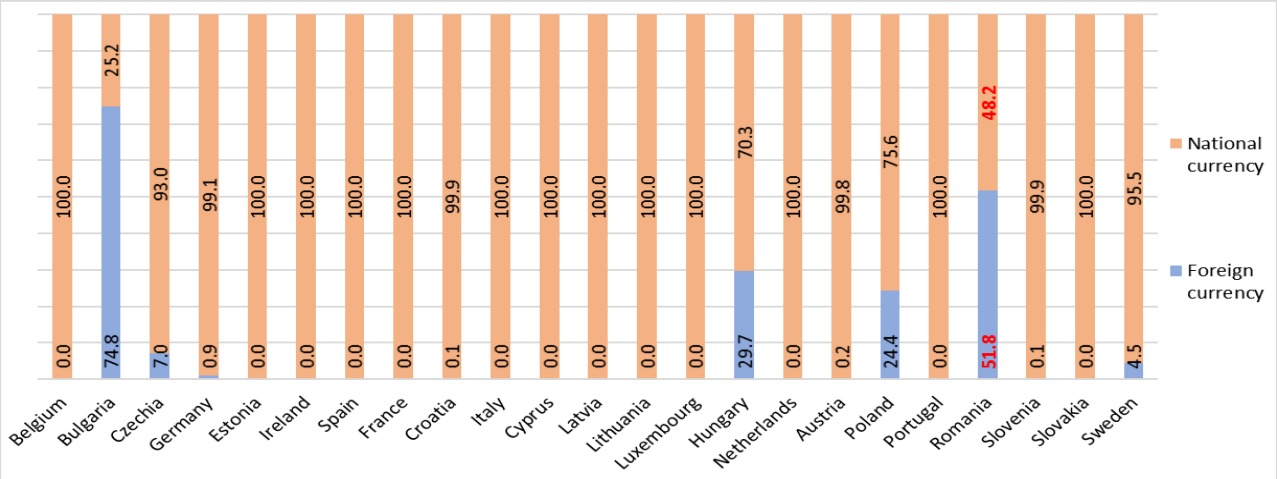

[1] change in nominal terms (current prices, national currency). *Source:* calculations based on Eurostat data, extracted on 31.07.2024; for missing countries data is not available.

The nominal increase in external public debt between 2020 and 2023 is positive in most countries for which data series are available and reaches rates higher than those of domestic financial companies, with values above 50% in Norway, Malta, Romania and Hungary.

As expected, the share of foreign currency debt is significant only in countries that have not adopted the euro: Sweden and some Eastern European countries (Bulgaria, the Czech Republic, Poland and Romania). Of these, Bulgaria (75%) and Romania (52%) have very high shares, as shown in the chart below.

**Figure 12**

**Structure of public debt by currency of issue, 2023 (%)**

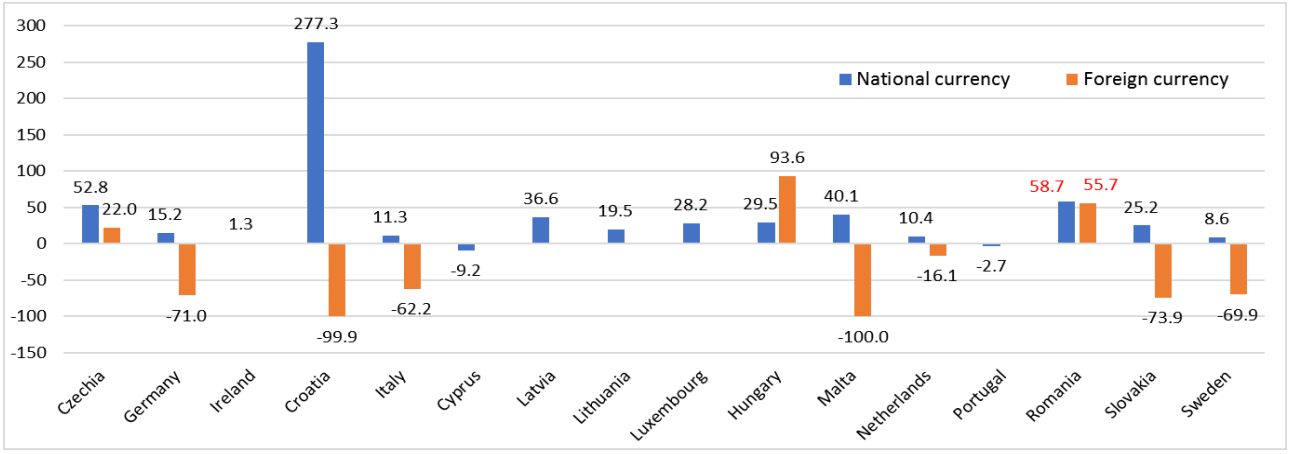



*Source:* calculations based on Eurostat data, extracted on 06.07.2024; for missing countries data is not available.

The relative increase in public debt in foreign currency between 2020 and 2023 is significant in Hungary and Romania (Figure 13). Euro area members with foreign currency debt have reduced it almost entirely (Germany, Italy, Malta, Slovakia), as have Croatia (which adopted the euro in January 2023) and one non-euro country (Sweden).

**Figure 13**

**Change in public debt, 2023/2020[1] (%), by currency of issue**




[1] Change in nominal terms (current prices, national currency). *Source:* calculations based on Eurostat data, extracted on 06.07.2024; for missing countries data is not available.

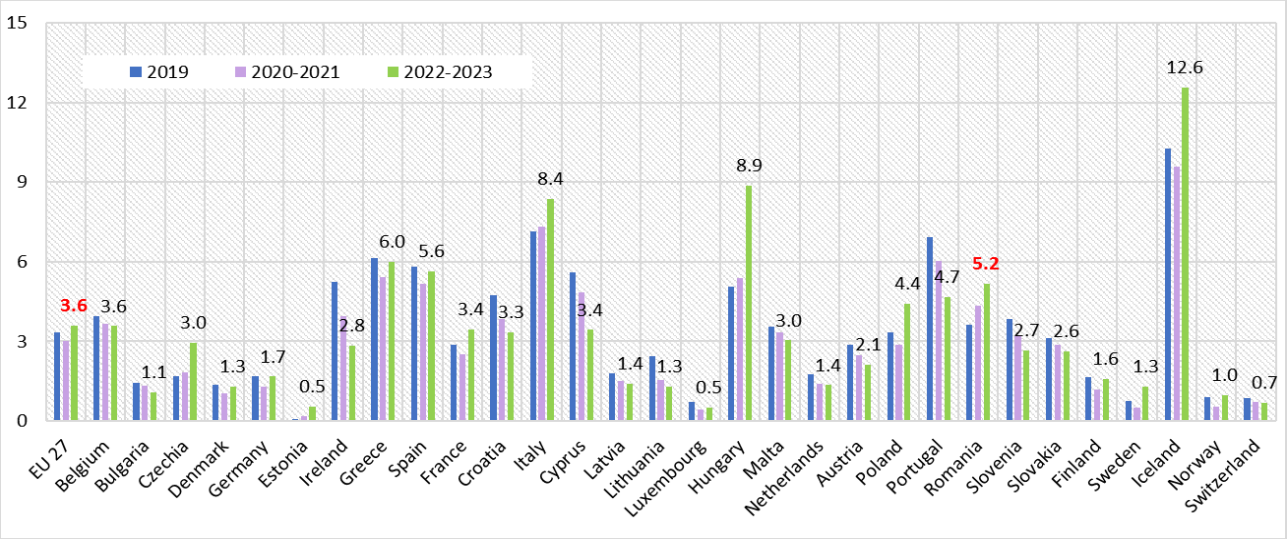
## 6. Public debt servicing cost

The need for public expenditure during the pandemic placed extreme pressure on national budgets and led to significant public deficits, the accumulation of public debt and, consequently, ever-increasing payments to service the public debt. The following figure reveals *interest expenditure as a percentage of budget revenue*, broken down into three time periods: the year before the pandemic (2019), the "acute" period of the pandemic (2020-2021) and the last available years (2022 and 2023).

At EU27 level, the increase in borrowing needed to cover budget deficits came against a backdrop of falling interest expenditure in absolute terms between 2018 and 2020, alongside rising revenues until 2019. The year 2020 brought a sharp decline in public revenues, but the commensurate decline in debt servicing maintained a low ratio between the two, which continued to decline until 2021. Subsequently, debt accumulation rose and interest payments increased, so that, despite the recovery in budget revenues, the ratio analysed began to rise and reached the 2018 level (3.7%) in 2023.

**Figure 14**

**Share of interest payments in budget revenue (%)**



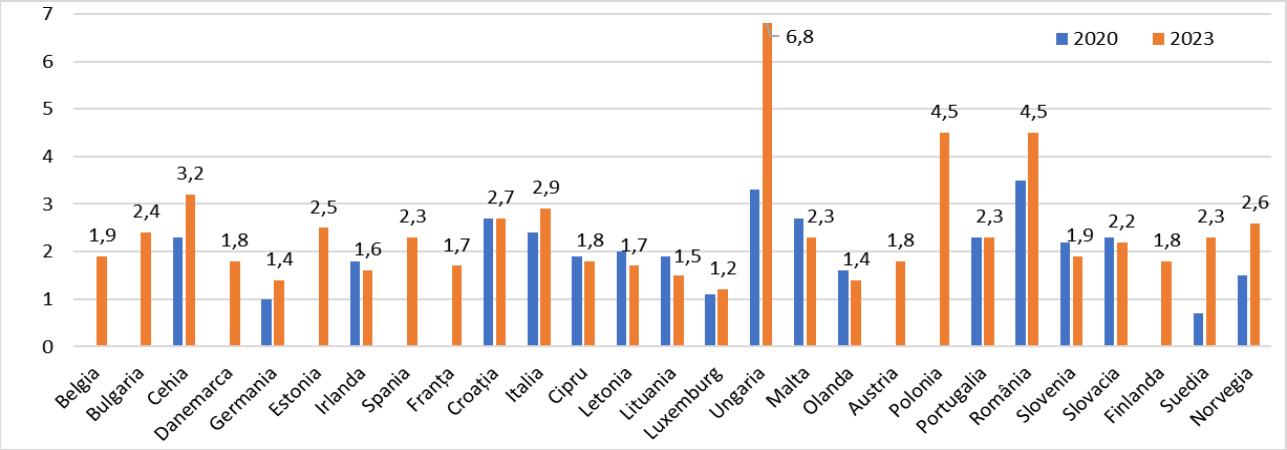

*Note:* values correspond to the 2022-2023 average. *Source:* calculations based on Eurostat data, extracted on 02.07.2024.

A group of three countries stands out – Italy, Hungary and Iceland – which reach very high values (over 8%) in 2022-2023, relative to the European average. Romania recorded an increase of interest share throughout the period, from 3.6% in 2019 to 6% in 2023, values above the European average.

By comparing interest to the average annual level of public debt, we get the *apparent cost of public debt*, which is a measure of how easy it is for the government to get loans on financial markets. Figure 15 describe the distribution of this indicator across EU countries for 2023 and, partially, 2020 (this year's figures are not available for all countries). Eastern European countries have the highest financing costs; Hungary stands out negatively, with a cost well above that of other countries and an increase of 3.5 p.p. between 2020 and 2023, followed by Romania and Poland, and then the Czech Republic. For Romania and the Czech Republic, the cost increased by 1 p.p. between the two years.

**Figure 15**

**Apparent cost of public debt (%)**




*Note:* values correspond to 2023. *Source:* Eurostat data, extracted on 07.07.2024.

## 7. Conclusions

As a result of high public expenditure, which exceeded revenue, the rate of public debt accumulation in the EU27 accelerated from 0.9% in 2019 to an average of 6.2% in 2020-2023. At the end of 2023, public debt represented 178% of EU27 public revenue. Starting in 2021, debt accumulation increased interest payments, so that their share in budget revenues, after a period of decline, began to rise and reached, in 2023, the level of 2018 (3.7%).

Among the sources of public debt financing, external creditors hold high shares (over 50%) in half of the 26 countries considered. The nominal increase in external public debt between 2020 and 2023 is positive in most countries for which statistical data series are available, reaching rates of over 50% in some countries, including Romania.

Romania's public debt more than doubled (110%) in current prices between 2019 and 2023, mainly due to the doubling of its main component - long-term debt securities. In relative terms, the increases were much higher for short-term loans and securities, which increased almost 20-fold and almost 9-fold, respectively. The slope of Romania's debt trend (17.7% in 2022-2023) is worrying, and maintaining it in the coming years would put pressure, through debt servicing, on public expenditure, which is already oversized in relation to public revenue (budget balance of -19.8% of revenue in 2023).

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