

STUDY

Requested by the BUDG Committee

The impacts of recent inflation developments on the EU finances



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Abstract

The focus of this study is the effect of inflation on the ongoing implementation of the current MFF on an aggregate level. The relevant inflation impacts and the channels via which they take effect are presented and analysed for the MFF and the EU revenue system. The study then maps and discusses policy options to mitigate these effects regarding the ongoing MFF and NGEU implementation, as well as with a view to the ongoing MFF mid-term revision.

This document was requested by the European Parliament's Committee on Budgets.

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LINGUISTIC VERSIONS

Original: EN

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Manuscript completed in November 2023

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This document is available on the internet at:

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LIST OF ABBREVIATIONS

| | |
|--------------|--|
| BEFIT | Business in Europe: Framework for Income Taxation |
| BGN | Bulgarian Lev (the Bulgarian currency) |
| BNB | Bulgarian National Bank |
| CAP | Common Agricultural Policy |
| CBAM | Carbon Border Adjustment Mechanism |
| CCI | Construction Cost Indicator |
| CEF | Connecting Europe Facility |
| CF | Cohesion Fund |
| CPI | Consumer Price Index |
| CPPI | Construction Producer Price Index |
| CSIC | Consejo Superior de Investigaciones Científicas (Spanish National Research Council) |
| EAGF | European Agricultural Guarantee Fund |
| EAFRD | European Agricultural Fund for Rural Development |
| ECB | European Central Bank |
| EDUSI | Estrategia de Desarrollo Urbano Sostenible e Integrado (Sustainable & Integrated Urban Development Strategy) |
| ERDF | European Regional Development Fund |
| ETS | (EU) Emission Trading System |
| ESF | European Social Fund |
| EUR | Euro (European currency) |
| EURI | European COVID-19 Recovery Instrument |
| GDP | Gross Domestic Product |

| | |
|----------------------|--|
| GNI | Gross National Income |
| HICP | Harmonised Indices of Consumer Prices |
| HUMA | Humanitarian Aid |
| IIA | Interinstitutional Agreement |
| ICEX | España Exportación e Inversiones (The Spanish Institute for Foreign Trade) |
| ICT | Information and Communication Technology (Service) |
| MFF | Multi-Annual Financial Framework |
| NGEU | NextGenerationEU |
| NDICI | Neighbourhood, Development and International Cooperation Instrument |
| NSI | (Bulgarian) National Statistical Institute |
| OP | Operational Programme |
| ORD | Own Resource Decision |
| R&D&I | Research, Development, and Innovation |
| R&I | Research and Innovation |
| RRF | (European) Recovery and Resilience Facility |
| RRP | (National) Recovery and Resilience Plans |
| SMEs | Small and Medium-sized Enterprises |
| STEM | Science, Technology, Engineering and Mathematics |

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EXECUTIVE SUMMARY

Background

Since autumn 2021 all Member States have been affected, albeit to different extents, by extraordinarily high inflation rates. These inflation surges impact public finances in the EU at the level of Member States, but also EU finances via various channels. Specifically, high inflation rates in the EU erode the firepower of the Multi-Annual Financial Framework (MFF) as well as the European COVID-19 Recovery Instrument (EURI) NextGeneration EU (NGEU), and they have an impact on the structure of EU revenues.

Aim

Regarding the **objectives**, this research study aims to provide a granular assessment of the impacts of inflation as of 2021 on the MFF and on the EU budget, including EURI-funded NGEU programmes. The study has two main objectives:

Firstly, the study explores the impact of inflation on the various elements of the EU budget (the ongoing MFF and the system of own resources) on an aggregate level. Moreover, two case studies illustrate the effects of the current inflation surge on National Resilience and Recovery Plans on which the implementation of NGEU is based.

Secondly, the study identifies policy options to cushion off adverse effects of inflation in the implementation of the ongoing MFF and NGEU, also with a view to the ongoing MFF mid-term revision, along with policy options for preventive measures to be considered in the post-2027 MFF and the related EU programmes, as well as in the EU revenue system.

Findings

Recent inflationary developments in the EU

In 2021, Europe experienced an unprecedented sharp rise in inflation, driven by soaring energy prices, which rebounded from their low levels during the COVID-19 pandemic demand slump. During the lockdowns imposed to prevent the spread of the virus, private households shifted their demand structure from services to goods. This consequently stressed supply chains and added price pressure on energy and other commodities. In 2022, energy prices got further impetus from Russia's invasion of Ukraine. The HICP's energy component experienced year-on-year price increases of around 40% for many months. Average EU inflation prior to the current bout of inflation was the highest at 4.3% in August 2008, whereas it reached its most recent peak in October 2022 at 11.5%. The high inflation environment in the last two years has also led to the biggest dispersion of inflation rates observed in the last 20 years. The accumulated inflation across the EU for the MFF 2007-2013 period was 17.0%, while the accumulated inflation across the EU for the MFF 2014-2020 period amounted to a mere 6.5%. In comparison, for the first 2.5 years of the current MFF 2021-2027 the accumulated inflation in the EU is already at 23.7%.

MFF expenditures

At the time the current MFF was compiled, a yearly inflation rate (e.g. HICP and GDP deflator) of 2% was assumed. Expenditure positions have been adjusted accordingly to compensate for the loss of purchasing power. This built-in 2% price rise is able to bolster an implicit cumulated loss in the MFF budget's purchasing power (without NGEU) of EUR 92.9 billion between 2021 and 2027.

In the wake of the COVID-19 pandemic, supply chain disruptions led to a sharp rise in internationally traded goods which was intensified further by Russia's invasion of Ukraine. Consequently, not only did consumer prices soar at unprecedented rates but many other prices did as well. This strong price rise

incurred stronger losses of purchasing power than those factored in and compensated by the 2% automatic deflator. In its mid-term review, the Commission estimated an additional loss of EUR 74 billion. A more detailed analysis in the underlying study calculates a total loss of EUR 109.5 billion instead, with the largest relative losses to be observed in Cluster 10 “Migration”, Cluster 5 “Regional Development and Cohesion” and Public Administration. The additional funds proposed by the Commission in its mid-term review would reduce the overall loss by EUR 27.5 billion, while increasing the purchasing power of some clusters as compared to the original MFF budgeting.

The impact of inflation on the MFF is not limited to EU expenditure but extends through grants and co-financing activities in the Member States. The recent price increase reduces the purchasing power not only of MFF expenditures but also of NGEU and of co-financing funds, thus increasing the overall loss of purchasing power further. However, an estimation of this additional loss goes beyond the scope of this study.

The strong increase of the GDP deflator can be expected to decrease the volume of the MFF in percent of GNI until 2027 to 0.96%, which is below the 1.05% of GNI envisaged when agreeing on the MFF 2021-2027.

EU revenue system

EU revenues in total are not affected by inflation as their overall amount is determined by expenditures as fixed by the MFF based on a 2% GDP deflator. However, inflation will change the contribution of the various financing sources to EU revenues, i.e., the structure of EU revenues, and accordingly Member States’ shares in overall revenues.

Consumer price inflation will increase **the shares of the VAT-based own resource, custom duties based on ad valorem rates, and taxes on EU staff salaries, while the share of the GNI-based own resource will shrink in a high inflation environment.** The share of the plastic own resource will decrease in any case if the call rate is not adjusted based on the 2% deflator or the actual inflation rate. The revenues from the remaining elements of “other revenues”, which are independent of inflation, will not be influenced by higher inflation; but their shares will decrease.

Higher consumer price inflation – as compared to the year before – will increase a Member State’s VAT-based own resource payments. If it is affected by an above-average rise in inflation, this Member State will experience a rise in its share in VAT-based own resource payments as well.

As an upward shift in the average EU inflation rate will increase total revenues from the VAT-based own resource, overall revenues from the GNI-based own resource will decrease. Member States with a GDP deflator above the EU average will see an increase of their shares in the reduced overall GNI-based own resource revenues, which could eventually result in an increase of their contribution in absolute terms as well.

An above-EU-average increase of the GDP deflator in one Member State increases the share of this Member State in overall GNI-based own resource payments and decreases it for other Member States where GDP deflators are below the EU average.

This mechanism also works when considering the lump sum corrections of GNI-based own resource payments for several Member States. Whenever the GDP deflator of a Member State eligible for a rebate is above the EU average, the share of this Member State in GNI-based own resource payments increases, while the share of all other Member States where GDP deflators are below the EU average is reduced.

The GNI-based resource is based on a Member State’s national income, with richer countries having to pay a larger share per capita than poorer ones. This effect is distorted by the following constellations:

- Due to a stronger increase in consumer price inflation, overall revenues from the VAT-based own resource are increasing, thus reducing the gap to be closed by the GNI-based own resource.
- Poorer countries experience above-average consumer price inflation and hence must contribute a larger share to overall VAT-based own resource payments.
- Poorer countries experience an above average rise in their GDP deflator which increases their share in overall GNI-based own resource payments.
- Member States which are eligible for a lump sum reduction of their GNI-based own resource contribution benefit more than in the past year from this rebate if their GDP deflator is below average because their rebates are adjusted regularly based on the EU average of the GDP deflator.

This study does not find that poorer Member States have seen their share in the MFF finances increasing, but it clearly shows that eastern Member States had to pay an extra inflation-induced contribution to the budget in 2021 and 2022. Their consumer price inflation, as well as their GDP deflators, were in both years clearly above the EU average, and the EU-wide increase of the consumer price inflation reduced the amount to be covered by the GNI-based own resource.

Regarding the impact of inflation on the adjusted first basket of new own resources suggested by the Commission in June 2023, it is plausible to assume that neither the ETS- nor the CBAM-based new own resource are directly influenced by inflation, whereas revenues from the own resource based on the corporate sector are likely to follow inflation in the longer run. Therefore, the proposed three new own resources of the adjusted first basket should be rather resilient to inflationary developments.

The second basket of new own resources originally envisaged in the IIA shall comprise taxes on financial transactions as well as on the corporate sector. Moreover, further options have recently been put forward in the academic and policy debate. Some of these new own resource options relate to bases that directly react to inflation. This concerns financial transactions whose nominal value can be expected to grow with inflation. Thus, the share of revenues from an own resource based on financial transactions in overall revenues (which under the current system grow at 2% annually) would increase for an inflation rate above 2%.

Case study 1: impact of inflation on the Bulgarian National Recovery and Resilience Plan

The case study on the impact of inflation on the Bulgarian National Recovery and Resilience Plan finds that the overall price of the projects in the Bulgarian National RRP can be expected to increase by an accumulated 30.9% throughout the years, which amounts to an average annual inflation between 2022 and 2026 of around 5.53%. This is much higher than the 2% annual inflation target embedded in the MFF and RRF automatic indexation component, which would amount over the five years to an accumulated inflation of 10.4%.

These inflationary developments will either reduce the real value of the projects envisaged under the RPP and therefore the volume of deliverables, will make them infeasible to implement, or will necessitate some upwards adjustments to their funding. The biggest contribution to these increased costs comes from projects with a high share of activities related to construction, and these projects also account for a considerable share of the overall RRP volume in comparison to projects less affected by inflation.

Member States will have to choose between three options when addressing the inflationary challenge. They can either increase the funding using national, as well as additional EU funding, they can drop specific projects which have become unrealistic in the timeline of the RRP, or they can reduce the

quantitative commitments taken in terms of milestones and targets. Inevitably, Member States will have to make difficult choices balancing these three options, while still achieving the overall goals of the RRP to contribute to green and digital transition and enhance the resilience and competitiveness of their economies. According to the case study for Bulgaria, the proposed amendments to the Bulgarian RRP include both the reduction and the cancellation of certain projects which have become infeasible.

Case study 2: impact of inflation on a specific partnership agreement and related operational programme for Spain

The case study on a specific partnership agreement and related operational programme for Spain finds that, while the Multiregional OP 2014-2020 faced a range of challenges stemming from the recent inflation-driven cost increases, the most pronounced difficulties were concentrated in construction and infrastructure projects within priority areas 06 (Preserving and protecting the environment and promoting resource efficiency) and 07 (Promoting sustainable transport and removing bottlenecks in key network infrastructures). These challenges led to problems in the construction contracts which subsequently resulted in delays in project implementation. Some projects had to renegotiate contracts due to financial pressures. In some cases, contracted firms withdrew from projects due to the unanticipated rise in energy and construction material prices, leading to contract termination. On other occasions, there was a lack of tenderers during the procurement processes due to the lack of interest on the side of construction companies stemming from a low profitability. Reprogramming aimed at adjusting the fund allocations was needed in the case of priority areas 06 and 07, which were characterised by low absorption rates, especially in the case of regions in transition. A certain number of projects will be phased out into the next funding period 2021-2027 to avoid their cancellation, ensure successful completion and maximise the investments.

The impact of inflation on research and innovation (R&I) projects seems to differ from those on other priority areas within the OP. Indeed, priority area 01 related to R&I did not necessitate significant reprogramming or fund reallocation. However, inflation might pose unique challenges for innovative companies, particularly small and medium-sized enterprises, for which the price increases are more complex to pass on to the final consumer. Furthermore, despite the increased allocation of EU funds to R&I, inflation might have diminished the real value and purchasing power of this budgetary expansion, potentially jeopardising R&I funding which relies heavily on EU resources.

Measures adopted at EU level contributing to addressing the inflation-driven challenges include the possibility of 100% co-financing and the possibility to transfer certain large-scale projects from MFF 2014-2020 to MFF 2021-2027. Making additional funds available to compensate for the increase in energy and material costs and the possibility of price revisions in public work contracts were among the measures adopted at national level. Nevertheless, analyses conducted by the Ministry for the Ecological Transition and the Demographic Challenge suggest that having an additional year for expense certification could significantly enhance performance, especially in the case of projects within priority area 06 whereby inclusion of other types of actions in the field of biodiversity or the circular economy would be difficult as they would entail a change in the programme's strategy.

Policy options

Based on the assessment of the impact of inflation on MFF expenditures and EU revenues as well as on the case studies, policy options for mitigating the impact of inflation on the EU budget and on national programmes are developed. These policy options are informed by desk research and expert interviews conducted for the two case studies, as well as with a representative of the European Court of Auditors. They can be summarised as follows:

Policy options for the implementation of the ongoing MFF 2021-2027

- **Use of existing margins and various flexibilities.** To compensate for inflation-induced budgetary pressures as well as real losses of pre-allocated funding, margins and various flexibilities (the Flexibility Instrument, thematic special instruments, other flexibilities) could be used.
- **Redeployment of pre-allocated funds across headings.** The re-allocation of pre-allocated funds from clusters where room for “doing more with less” is larger than in others, inter alia due to their sheer size, would be another option to avoid cuts in smaller expenditure items that deliver important contributions to European added value and to urgent challenges the EU is confronted with. Concretely, such a shift could consist of re-allocating funds from the Common Agricultural Policy (CAP) or cohesion funds to clusters that are particularly important regarding strategic EU goals but are rather under-funded (e.g. research and innovation or the Connecting Europe Facility (CEF)).
- **Increase of selected cluster ceilings based on the actual inflation rate.** The ceilings of clusters with a particularly significant contribution to European added value (e.g. Horizon Europe or the CEF) or to particularly urgent challenges (e.g. Migration) could be adjusted according to the relevant inflation rate, while other ceilings would continue to be adjusted by the 2% deflator.
- **Establishment of a EURI thematic special instrument over and above cluster ceilings.** The establishment of a EURI special instrument would remove the budgetary pressure caused by the unexpected increase of interest payments.
- **Increase of Heading 7 “European administration”.** To mitigate the budgetary pressure with Heading 7 “European administration”, a mixture of expenditure increases and savings could be envisaged.
- **Assessment of the impact of high inflation on the EU budget over several years.** The Commission should monitor and assess the impact of high inflation on the EU budget during the remaining duration of the current EU budget, as a basis to come forward with instruments and approaches to cope with adverse effects of inflation on the EU budget.

Policy options for the EU revenue system

- **Reduce the weight of the VAT-based own resource.** To mitigate undesirable redistributive effects of an inflation-induced shift in EU overall revenues across Member States, the weight of the VAT-based own resource could be reduced by decreasing the current call rate of 0.3% or by reducing the current cap of 50% of the VAT base.
- **Accelerate the introduction of the new own resources contained in the adjusted first basket of new own resources.** The revenues from these new own resources could be used to finance the inflation adjustment of certain MFF clusters, a EURI thematic special instrument, the (advanced) repayment of EU funding costs, or the increase of the flexibility instruments without having to raise GNI-based own resource payments.
- **Automatic inflation adjustment of call rates that are denominated in absolute values.** To avoid the devaluation of revenues from own resources for which call rates are denominated in absolute values (currently the plastic own resource), the call rates should be inflation-adjusted regularly.

Policy options for the implementation of national RRP

- **Application of different indexation methodologies.**
- **Permission for contracting ministries or institutions to identify the necessary cost adjustments themselves.** Regarding the national RRP, where project implementation is still at its early phase or has not yet started, the contracting ministries or institutions could be permitted to identify the necessary cost adjustments themselves.
- **Funding for indexation through additional national financing from Member States' budgets.**
- **Funding for indexation through the additional resources from RePowerEU.**
- **In the face of significant delays in the implementation of projects for the RRP, Member States can and should adjust their national RRP accordingly and justify if some projects have become unrealistic timewise or financially for Member States.**

Policy options for the implementation of operational programmes

- **Possibility to transfer certain large-scale projects from one MFF period to another.**
- **Flexibility in reallocation of funds and enabling 100% co-financing rates.**
- **Provision of additional funding to compensate for the increase in energy costs.**
- **Revision of public work contracts.**

Policy options to make future EU budgets more resilient to inflation

- **Replace the current 2% deflator by adequate inflation indicators to adjust EU budget expenditures to inflation.** To avoid losses in purchasing power and budgetary pressures caused by high inflation, and to preserve the EU's ability to react to unforeseen developments requiring additional interventions, MFF ceilings as well as the various flexibility instruments should be adjusted to actual inflationary developments by using adequate inflation indicators.
- **Implement additional new own resources.** Additional new own resources should be implemented, preferably new own resources that are associated with steering effects supporting important EU objectives and whose revenues develop in tandem with inflation. Where needed and possible, their design should avoid the negative effects of inflation (e.g. by automatically adjusting call rates denominated in absolute values to inflation).
- **Adjust call rates denominated in absolute values automatically to inflation.** To avoid the devaluation of revenues from own resources for which call rates are denominated in absolute values, call rates should be inflation-adjusted automatically.
- **Implement a special instrument for interest expenditure over and above MFF ceilings.** A permanent special instrument should be established that covers funding costs incurred by EU borrowing (particularly within NGEU, but also within the envisaged Ukraine facility and other existing and future EU debt operations).
- **Envisage a comprehensive review and modernisation of the outdated accounting framework of the EU budget.** A solution that would be more ambitious than the implementation of additional special instruments (for example a special thematic EURI instrument covering EU funding costs) and, more generally, reacting in an ad-hoc manner to upcoming unforeseen challenges and events within a piecemeal approach, is the comprehensive modernisation of the accounting framework of the EU budget, which could be integrated in the ongoing efforts to strengthen the performance orientation of the EU budget.

1 INTRODUCTION

During the past 15 years, the EU has been confronted with multiple crises as well as mounting long-term challenges. These imply the need to make increasing financial means available for the EU to be able to cope with short-term crises as well as long-term challenges. However, the Multi-Annual Financial Framework (MFF) has not kept up with increasing financial needs, but has rather been decreasing or stagnating, respectively, at about 1% of GNI since the beginning of the 2000s (Bachtrögler-Unger et al., 2021). The European COVID-19 Recovery Instrument (EURI) NextGenerationEU (NGEU) therefore represents a much-needed addition to the regular MFF 2021-2027, increasing the overall EU budget's firepower to 1.7% of GNI for the current MFF period. **This firepower, however, is increasingly being eroded by the extraordinarily high inflation rates affecting all EU Member States, albeit to a different extent, since autumn 2021.**

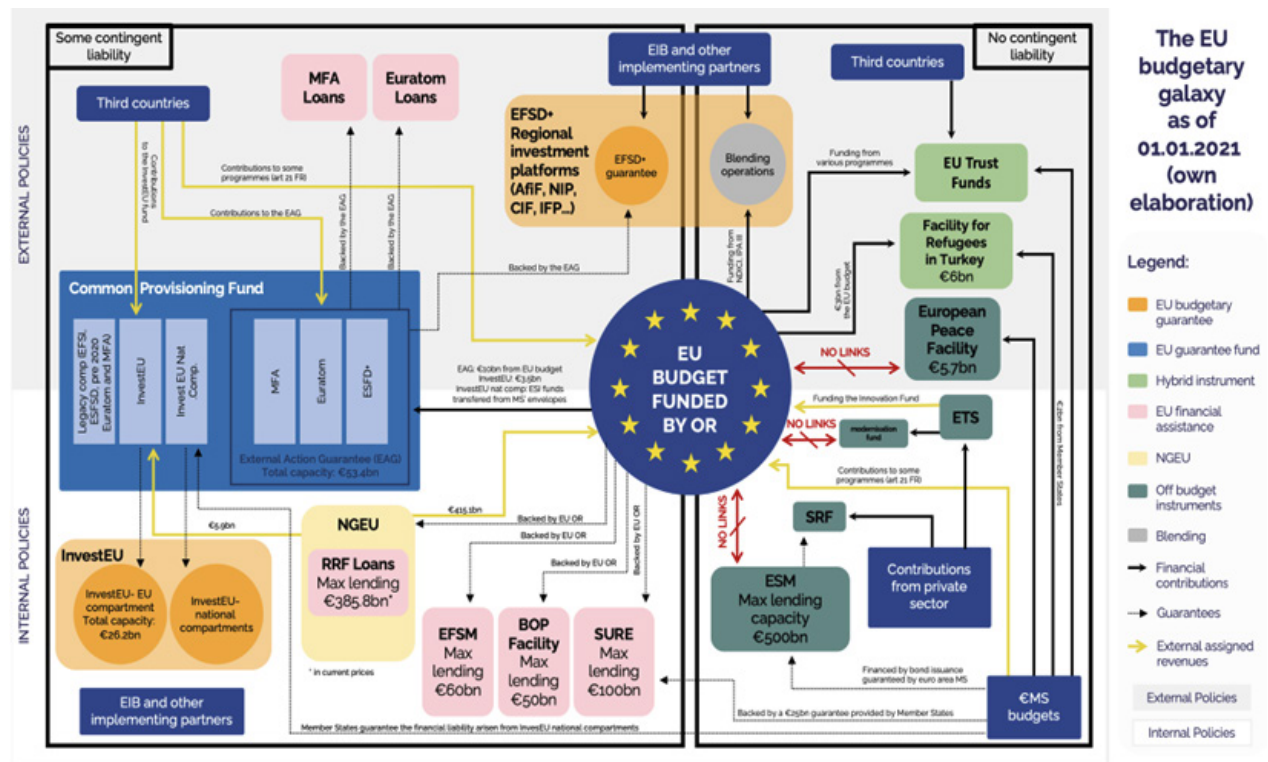
The allocations within the ongoing MFF as well as NGEU are immediately affected by inflation as the allocations foreseen are losing in real value with yearly upward adjustments limited to 2% (Padilla Olivares, 2022), which is markedly below the recent and current inflation rates and that expected for the next year. At the same time, the high inflation environment is putting strain on the EU budget also from another angle. With monetary policy increasingly pursuing a restrictive path to bring down high inflation, interest rates, which have been close to zero at the time of adopting NGEU (which is financed by common EU debt), have been on the rise recently. Thus, expenditures for servicing NGEU debt for loans taken in all years after 2020 will considerably exceed those projected originally, raising the question how to accommodate the resulting need for additional financial means (European Parliament, 2023a; Claeys et al., 2023). Not least, the impact of inflation on the EU budget includes several effects on the EU own resource system, as various revenue sources depend on nominal values and hence indirectly on inflation.

Regarding the **objectives**, this research study aims to provide a granular assessment regarding the impacts of inflation as of 2021 on the MFF and on the EU budget, including EURI funded NGEU programmes. The study has two main objectives:

- First, the study explores the impact of inflation on the various elements of the EU budget (the ongoing MFF, NGEU, and the system of own resources) on an aggregate level as well as differentiated across Member States and MFF programmes.
- Second, the study identifies policy options to cushion off adverse effects of inflation in the implementation of the ongoing MFF and NGEU, also with a view to the upcoming MFF mid-term review, as well as policy options for preventive measures to be considered in the post-2027 MFF and the related EU programmes as well as in the EU revenue system.

The EU budget has evolved into a relatively complex structure over the past decades. Its core consists of the MFF, which comprises EUR 1,074.5 billion (at 2018 prices) over the period 2021 to 2027. Another EUR 750 billion (at 2018 prices) stem from NGEU, the temporary crisis facility established in 2020 to support Member States' recovery after the COVID-19 crisis by providing grants (EUR 390 billion) and loans (EUR 360 billion) to Member States between 2021 and 2026. In addition, a plethora of instruments and mechanisms has been implemented during the last decades to result in the so-called "galaxy" of the EU budget (see Figure 1).

Figure 1: The Galaxy of the EU Budget



Source: Begg et al. (2022).

The focus of part 1 of the study which is covered in this report are inflation impacts affecting the ongoing implementation of the current MFF 2021-2027 and the EU revenue system, on an aggregate level. In a first step, the relevant inflation impacts and the channels via which they take effect are presented and analysed in a detailed and comprehensive way for the various areas of the EU budget. In a second step, policy options to mitigate these effects regarding the ongoing MFF and NGEU implementation and with a view to the upcoming MFF mid-term revision are mapped and discussed.

Thus, including this introduction (Chapter 1), the first part of the study consists of five chapters. Chapter 2 describes the recent inflationary developments in the EU. Chapter 3 identifies the elements of the EU budget affected by inflation as well as the channels through which they are influenced on an aggregate level. Hereby, we focus on the ongoing MFF and the EU revenue system. In chapter 4, two case studies are elaborated to illustrate the impact of inflation on specific EU budget programmes. Chapter 5 presents options for mitigating the impact of inflation on the EU budget. Hereby the focus will first be on measures related to the ongoing implementation of the MFF 2021-2027 that could be relevant with regard to the upcoming MFF mid-term revision. Furthermore, policy options beyond the MFF Regulation are discussed.

2 INFLATIONARY DEVELOPMENTS IN THE EU

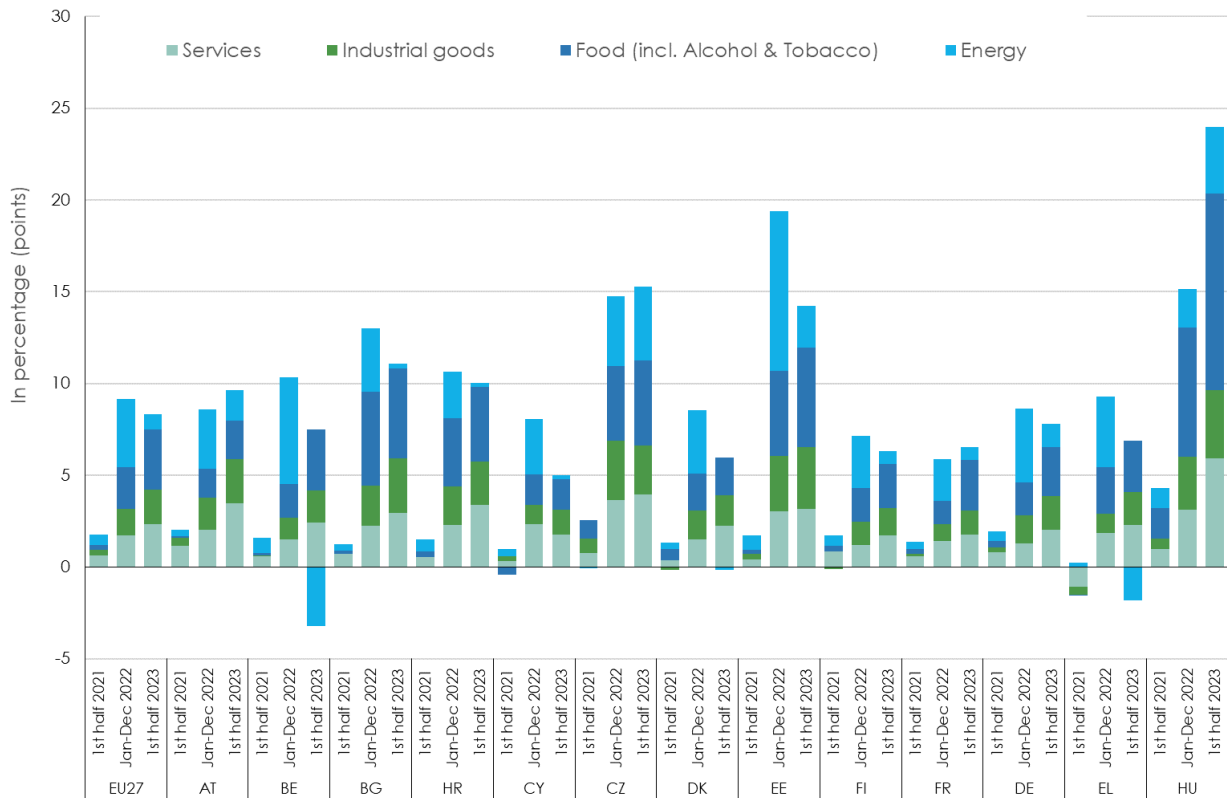
In this chapter, the trend of the inflation rates within the EU – as measured by the Harmonised Indices of Consumer Prices (HICP) – is tracked, including inflation dispersion over the Member States. Regarding the methodological approach, this part of the study follows Baumgartner et al. (2022). The data used in that study has been updated and its scope extended from the Euro Area countries to the whole EU as depicted in Figures 2 to 6.

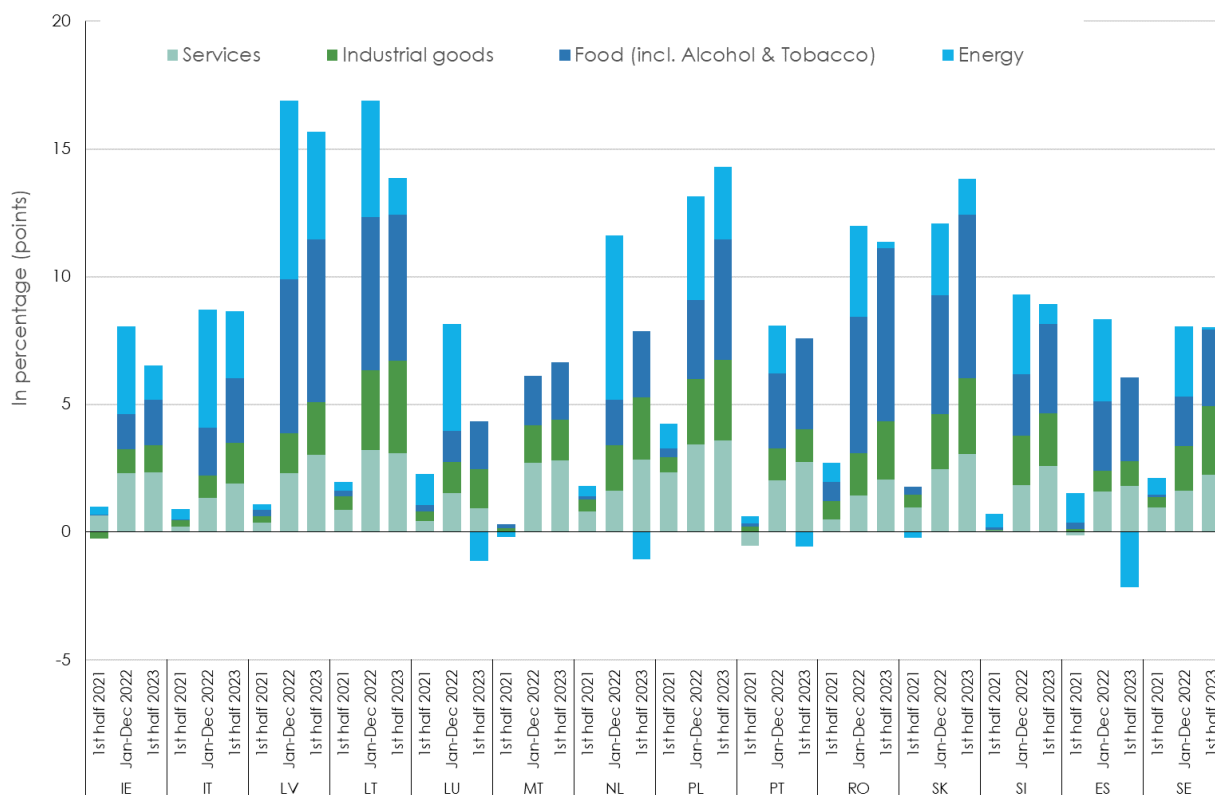
2.1 Recent trend of inflation rates in the EU

In 2021, Europe experienced an unprecedented sharp rise in inflation, driven by soaring energy prices, which rebounded from their low levels during the COVID-19 pandemic demand slump. During the lockdowns set to prevent the spread of the virus, private households shifted their demand structure from services to goods. This consequently stressed supply chains and added price pressure of energy and other commodities. In 2022, energy prices got further impetus from the invasion of Russia into Ukraine. The HICP's energy component experienced year-on-year price increases of around 40% for many months.

The rise in energy prices was passed on to other demand components with some time lags. Consumer price inflation in the EU peaked in October 2022 at a rate of 11.5%. The overall index, excluding energy and unprocessed food (i. e. core inflation), peaked somewhat later at the beginning of 2023, at a time when energy prices already started to lose momentum.

Figure 2: Inflation rates in the European Union and EU Member States





Source: Eurostat, Macrobond, own representation.

Although price pressures originated from international energy prices and supply chain disruptions, not all EU Member States saw their consumer prices increasing at similar rates. Especially EU countries located to the Eastern border, such as the Baltic States and Hungary, experienced very high HICP increases of around 20% toward the turn of the year 2022/2023.

The reasons for increasing differences in consumer price development between Member States not only included some countries' proximity to Russia, but also large differences in economic policy measures implemented for counteracting or alleviating adverse effects of inflation. Nearly all Member States implemented price caps for certain consumer products to a different extent.¹ Especially the prices for energy products as included in the HICP developed differently as given in Figure 2. The difference in energy price rises between countries exceeded 20 percentage points in 2022.

2.2 Evaluation of inflationary pressures

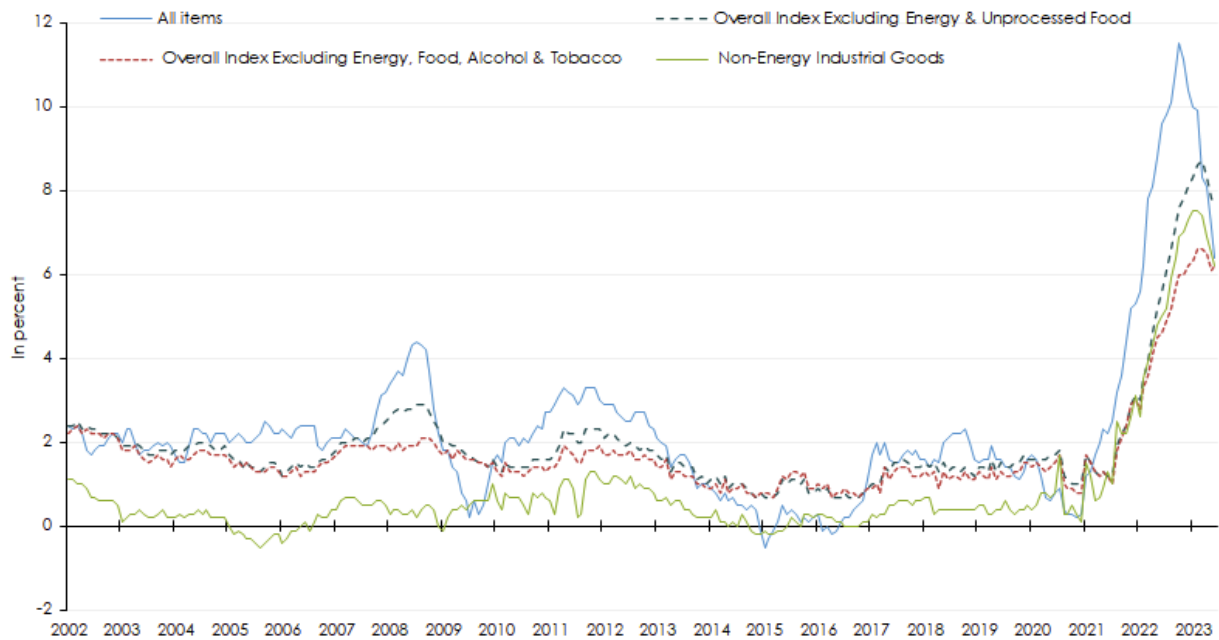
To evaluate the relative effect of the current inflation shock in a historical context, a comparison is drawn with historical inflation developments in the EU and EU Member States in the previous budget periods MFF 2007-2013 and MFF 2014-2020. Both the average inflation rates and the dispersion of inflation across Member States are discussed in order to assess differences across Member States and the distributional effects of inflation.

Looking at the overall HICP index, one can clearly see that the inflation rates observed in the past two years have been abnormal in any historical comparison for EU inflation. **Average EU inflation prior to the current bout of inflation was the highest at 4.3% in August 2008, whereas it reached its most**

¹ See Baumgartner et al. (2022).

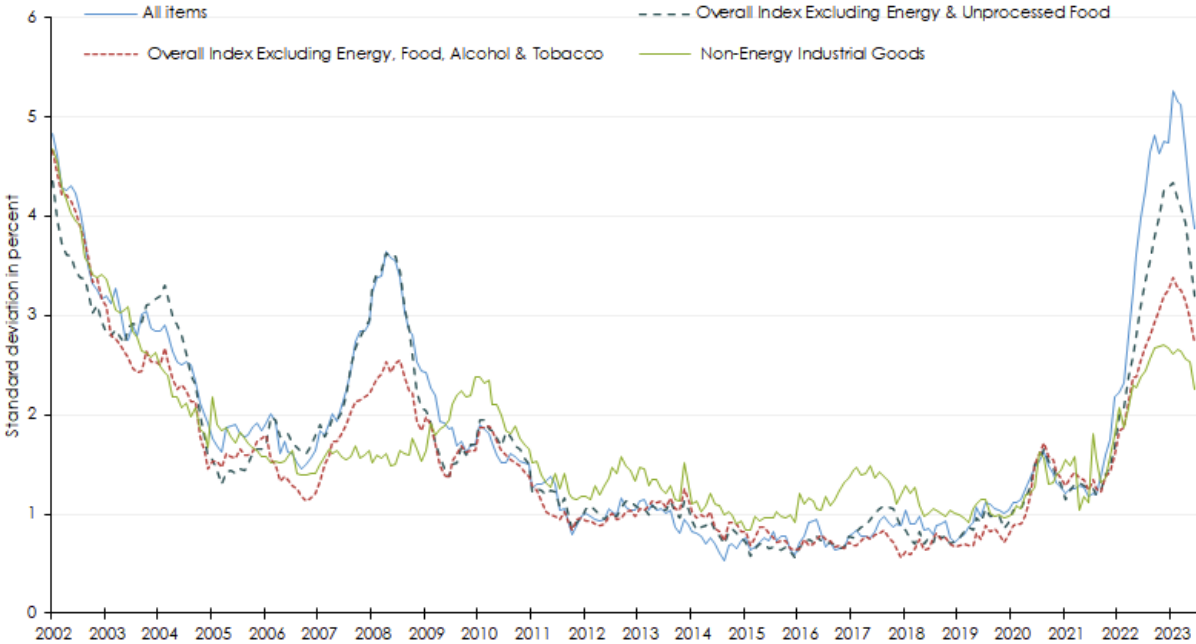
recent peak in October 2022 at 11.5% (Figure 3). **The high inflation environment in the last two years has also led to the biggest dispersion of inflation rates observed in the last 20 years.** While the standard deviation of HICP inflation stood the highest at 3.7% in May 2008, it reached a new height at 5.3% in January 2023 (Figure 4). This points to the fact that the stark rise in international energy prices had a heterogeneous effect on Member States' inflation rates. Differences in inflation rates mean that the loss of purchasing power of consumers varies between member states unless governments alleviate adverse effects by monetary transfers. Furthermore, a high standard deviation of inflation rates over euro area Member States makes it more difficult for monetary policy to achieve the goal of inflation moderation with a uniform key interest rate. Also, Member States' shares in financing the EU's budget are changing, as it will be demonstrated later on.

Figure 3: European Union, HICP inflation, annual rate of change



Source: Eurostat, Macrobond.

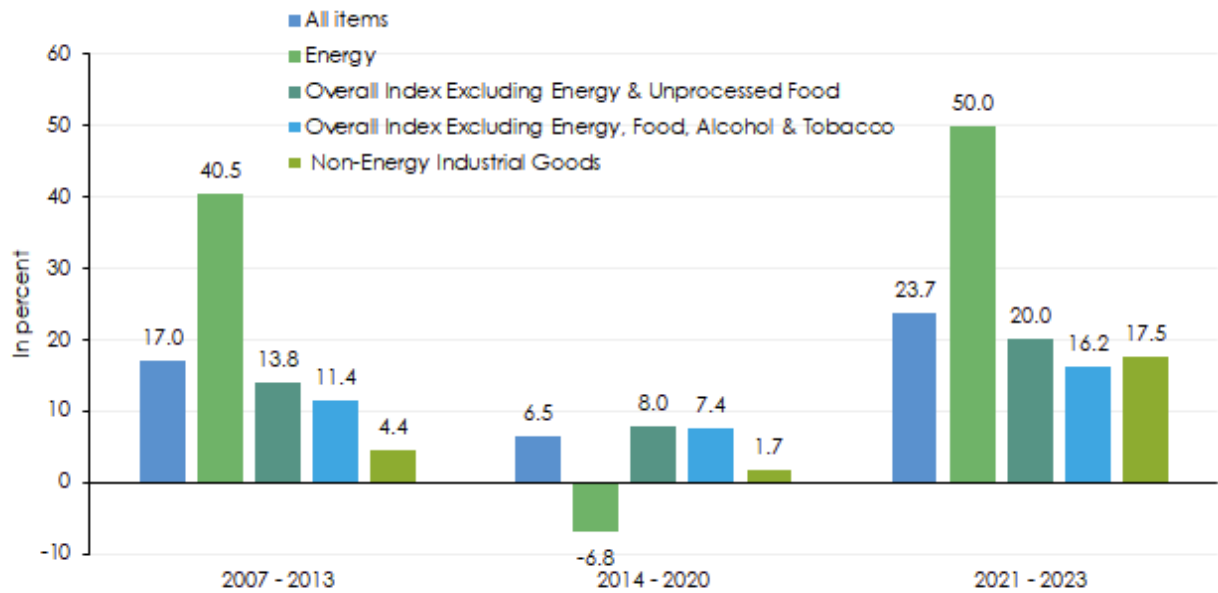
Figure 4: European Union, HICP inflation, standard deviation over all EU Member States



Source: Eurostat, Macrobond.

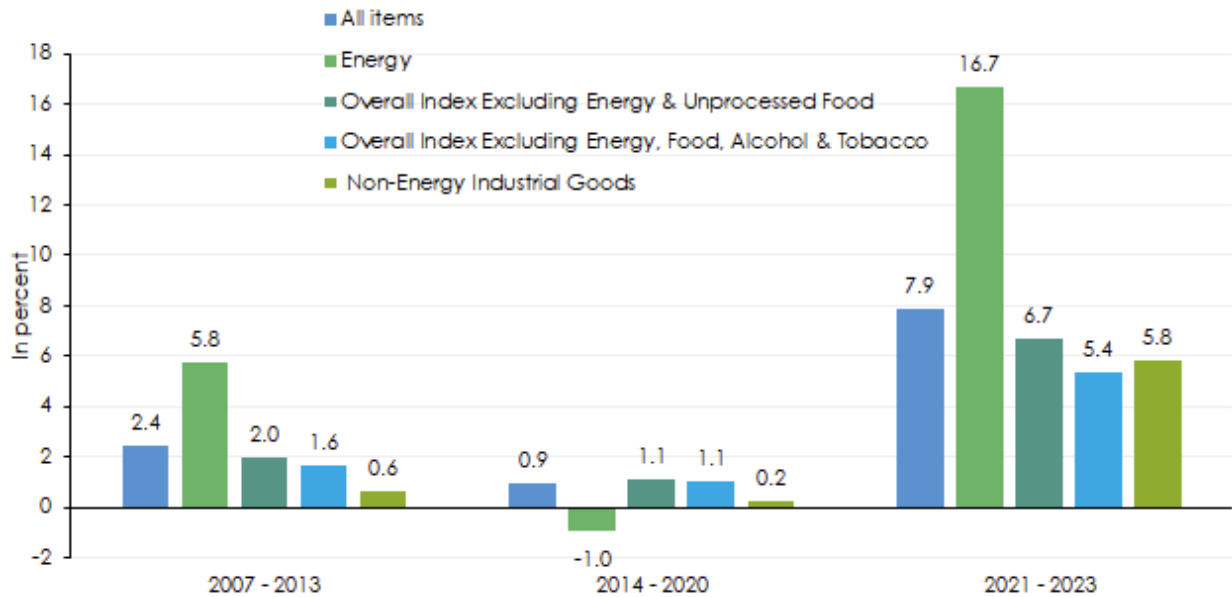
Comparing inflation rates between the different programming periods of the MFF clearly shows the severity of the problem of inflation in the current programming period in comparison to the previous ones. **The accumulated inflation across the EU for the MFF 2007-2013 period was 17.0%, while the accumulated inflation across the EU for the MFF 2014-2020 period amounted to a mere 6.5%. In comparison, for the first 2.5 years of the current MFF 2021-2027 the accumulated inflation in the EU is already at 23.7%** (Figure 5). Similarly, when looking at average inflation over the years of each of the periods, average inflation for 2007-2013 amounted to 2.4%, for 2014-2020 it reached 0.9%, while for the ongoing MFF period inflation has been 7.9% per year on average (Figure 6). All of this points to the exceptional pattern of the current inflation bout in comparison to previous EU budget periods.

Figure 5: Accumulated HICP inflation over the MFF periods



Source: Eurostat, Macrobond. – Data for the period 2021-2023 until June 2023.

Figure 6: Average yearly HICP inflation over the MFF periods



Source: Eurostat, Macrobond. – Data for the period 2021-2023 until June 2023.

3 IMPACT OF INFLATION ON THE ONGOING MFF

This chapter identifies the elements of the EU budget affected by inflation as well as the channels through which they are influenced on a granular level. Hereby, we focus on the ongoing MFF and the EU revenue system.

3.1 MFF expenditures

Within the MFF, expenditure positions are agreed on the price level of a certain base year (2018 for the ongoing MFF) and a constant deflator of 2% is applied during subsequent years. Hence, their absolute amount is fixed and not affected by possibly changing inflation rates in future years. Due to the price hikes following the supply chain pressures in the wake of the COVID-19 pandemic and the Russian invasion into Ukraine, prices have grown considerably stronger than expected at the end of 2020 when the MFF was agreed on. The HIPC has grown by 9.2% in 2022 alone, and an inflation rate close to 7% seems plausible for 2023. As the GDP deflator, which only measures price increases for domestic production, typically shows some delayed co-movement, this index also increased. While it was at 2.4% in 2021 it increased by 5.1% in 2022. The national accounts statistics for the first half of 2023 show a further increase by 6.5%. This GDP deflator forms the basis for the price adjustment of GNI used for determining GNI-based own resources.

The envisaged MFF volume of 1.05% of EU GNI gets distorted by unexpected price increases beyond the assumption of 2%. An accumulated price rise of 2% per year corresponds to an increase of almost 15% by the end of 2027. **Based on the rise of the GDP deflator until the mid of 2023 and a realistic assumption of a gradual further decrease² an accumulated price increase of almost 26% in 2027 can be expected. This means that only from the increase of the GDP deflator, total MFF expenditures do not reach the envisaged 1.05% but only 0.96% of EU GNI in 2027.³**

To identify the size of the negative impact of inflation on the purchasing power of the MFF, a more realistic price adjustment of expenditures is proposed here. Instead of assuming a general increase of the deflator of 2%, more appropriate deflators are applied. These deflators take into account the most recent price developments⁴ and are extended by a plausible forecast over the current MFF period.

It needs to be pointed out that the current flexibility with respect to the precise use of the funds within the various headings makes such assumptions difficult and components may vary over the years. Nevertheless, it can be expected that this more detailed price adjustment is superior to a uniform application of a CPI development to all types of expenditures.

Where available, the Commission's Summer 2023 economic forecast is used for estimating the price increases for 2024 with adjustments to the published figures for 2023 to consider the realisations already observed until August 2023. This leads to a higher HICP forecast for 2023 of 6.9% instead of 6.5% as recently forecast by the Commission, which was due to the resurgence of oil prices in August and the first half of September. For the years beyond 2024, as no other forecast based on country details was available, the forecasts of price changes of the Oxford Economic model were applied⁵.

The various deflators and their price changes between 2021 and 2027 are presented in Table 1.

² 2021: 2.4%, 2022: 5.1%, 2023: 6.5%, 2024: 3.2%, 2025: 2.3%, 2026: 2% and 2027: 2%.

³ $0.0105 \times 1.15 / 1.26 = 0.0096$

⁴ The cut-off date for price developments is 20 September 2023. It therefore includes Eurostat's latest CPI release for August 2023.

⁵ The model's results were also used for the evolution of other price indexes as given in Table 1.

Table 1: Annual rate of change of prices and deflators

| | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 |
|---------------------------|----------------------------------|------|-------|------|------|------|------|
| | Annual rate of change in percent | | | | | | |
| EU HICP all items | 2.9 | 9.2 | 6.9 | 3.2 | 2.3 | 2.0 | 2.0 |
| EU wages | 0.7 | 2.9 | 9.2 | 6.9 | 3.2 | 2.3 | 2.0 |
| EU construction | 6.0 | 10.9 | 6.2 | 3.2 | 2.8 | 2.5 | 2.5 |
| EU machinery ¹ | 1.9 | 5.0 | 3.8 | 2.0 | 0.8 | 0.8 | 0.8 |
| Belgium HICP all items | 3.2 | 10.3 | 3.4 | 3.5 | 2.5 | 2.0 | 2.0 |
| Belgium HICP energy | 22.4 | 57.9 | -21.6 | -1.6 | -3.7 | -1.5 | 0.7 |

Source: Eurostat, European Commission, Oxford Economics and own calculations. – ¹ EU Machinery is the EU 27 residual of National Accounts gross fixed capital formation excluding construction. It is used here for deflating expenditure on machinery investment.

The EU 27 HICP is the harmonised consumer price index for the whole EU. It can be used to deflate payments supporting the income of individuals such as income subsidies to farmers or refugees. Furthermore, it can be assumed that wages will follow its development with a lag of approximately one year.

The EU 27 HICP Energy is the energy component as included in the consumer price index. The EU 27 Construction is the national accounts deflator for construction investment, and the EU 27 rest of GFCF (gross fixed capital formation) is the part of national accounts gross fixed capital formation excluding construction. It will be used for deflating expenditure on machinery investment.

These various price growth rates are weighted together according to the structure of the MFF expenditure, broken down by the MFF clusters (see Table 23). Therefore, it is more granular than the Commission's approach. As neither for the given clusters nor for the projects they include data about the shares of expenditure on wages, construction investment, machinery investment and residual positions could be retrieved, assumptions concerning their respective shares based on the description of projects were made instead⁶.

3.1.1 Single Market, Innovation and Digital

Cluster 1 – Research and Innovation

This cluster covers mostly expenditure of Horizon Europe, the Euratom Research and Training Program and the International Thermonuclear Experimental Reactor, with Horizon Europe having a share of 90%. Horizon Europe funds different types of collaborative projects including, for example: Research and innovation action (RIA) that establishes new knowledge or explores a new or improved technology, product, process, service or solution. It is assumed that 20% of this expenditure are allocated to construction activities, 40% on machinery investment and the remaining 40% on wages.

Cluster 2 – European Strategic Investments

The funds InvestEU Fund and Connecting Europe Facility (CEF) – for transport, energy and digital account for around 80% of the expenditure of cluster 2. These funds are complemented by guarantees

⁶ The second part of the study will shed more light on the structure of expenditures in selected important spending areas.

aiming at to the promotion of investment in EU policy priority areas, including the green and digital transitions, research and innovation, the European health sector, strategic technologies, and projects of common European interest. It is assumed that 45% each of these expenditures can be deflated by the construction index and the machinery prices, respectively. The remaining part should be deflated by a wage index, which is supposed to move along with (a one-year lag of) the total HICP development.

Cluster 3 – Single Market

This cluster has a rather small share of less than 1% in the total MFF volume as respective investment activities are covered under the InvestEU title. Nearly half of the budget is spent on food safety activities. It can be assumed that 80% of this budget go into wages and the rest into machinery investment.

Cluster 4 – Space

This cluster addresses the targets of EU space policy, satellite technology and innovation, and communication services. It is assumed that 70% of the expenditures under this title are dedicated to machinery investment and another 30% to wages.

3.1.2 Cohesion, Resilience and Values

Cluster 5 – Regional Development and Cohesion

This cluster covers the largest share in the overall MFF volume at almost 25%. It comprises the structural funds *European Fund for Regional Development* (ERDF) and the *Cohesion Fund* (CF). As their target is fostering growth and employment in those regions whose development is lagging behind, expenditure is concentrated on investment activities. Both funds provide support to a transition towards a more competitive and smarter Europe (Policy Objective – PO 1), as well as greener, low-carbon transitioning towards a net zero carbon economy and resilient Europe (PO2). Their typical type of expenditure is concentrated on investment in construction activities and partly in machinery, with only a minor share in wages. We assume their respective shares at 60% for construction, 30% for machinery, and 10% for wages.

Cluster 6 – Recovery and Resilience

Around 97% of the pre-allocated funds for the RRF are distributed via NGEU. Here, only the part of Cluster 6 which is included in the MFF is considered. This is mainly the amount envisaged for financing and repayment of the NGEU debt, which has a share of 70% of overall expenditure in this cluster. As the NGEU is a new initiative, the costs in cluster 6 concern interest payments and not repayments of funds. Depending on the projects submitted by Member States the EU will take loans on financial markets every year. The costs as included in Cluster 6 should cover the corresponding interest payments.

The MFF is based on assumed interest rates between 0.55% and 1.55% over the period 2021 –2027 (Claeys et al., 2023), which shall serve as our low inflation scenario. For our medium (more realistic) scenario, we build our forecast along the authors' baseline scenario which instead of accumulated costs of EUR 12.9 billion in the MFF yields EUR 50 billion, with EUR 9.9 billion in 2027. In our high inflation (and interest) scenario, we assume an interest rate of 0.1 percentage points higher for 2023 and 0.2 to 0.3 percentage points higher in the following years (Table 2).⁷

⁷ For a detailed discussion of the increase in NGEU borrowing costs and possible policy proposals to address it, see Annex I.

Table 2: Assumed evolution of interest rates for EU borrowing, 2021-2027

| Interest rates (yields) % | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 |
|---------------------------|------|------|------|------|------|------|------|
| Low inflation scenario | 0.55 | 0.55 | 0.75 | 0.95 | 1.15 | 1.35 | 1.55 |
| Medium inflation scenario | 0.30 | 2.00 | 3.20 | 3.50 | 3.00 | 2.80 | 2.50 |
| High inflation scenario | 0.30 | 2.00 | 3.30 | 3.70 | 3.30 | 3.00 | 2.80 |

Source: Own calculations.

However, debt service could be lower if it is assumed that not all RRF funds are called by national governments. In this case, the EU borrowing on markets could be lower, resulting in lower financial costs over the MFF period.

With the increase in the costs of finance, the share of this item in the total expenditure of Cluster 6 will rise from 70% to 90%. The remaining 10% are assumed to be spent in equal parts on wages and machinery investment. The financing costs for NGEU do not experience a loss of purchasing power, as these funds are cost increases and not purchases. Hence, they are assigned with a 0% price rise resulting of the weights not adding up to 1 but just 0.1.

Cluster 7 – Investing in People, Social Cohesion and Values

Expenditures of this cluster (almost 11% of the total MFF volume) are assumed to be concentrated on wages and mobility support. By far the largest component of this cluster is the European Social Fund (ESF), followed by the Erasmus+ initiative which targets education, youth, and sports. Therefore, we deflate this in half by total HICP price increases and by wage increases, which are linked to HICP increases of the preceding year.

3.1.3 Natural Resources and Environment

Cluster 8 – Agriculture and Maritime Policy

Within this cluster, the *European Agricultural Guarantee Fund* (EAGF) and the *European Agricultural Fund for Rural Development* (EAFRD) are the largest budgetary items, covering around 95% of the funds allocated to this cluster. The EAGF is more than three times larger than the EAFRD and its funds are nearly exclusively reserved to provide income support for the agricultural sector. Therefore, we deflate 70% of the funds with the HICP and the rest, which is mainly dedicated to investment purposes, with the deflators for machinery and construction (15% each).

Cluster 9 – Environment and Climate Action

This cluster is a relatively small one, as the related targets are addressed by investment programmes included in various other MFF clusters. Around 70% of the budget flows into the Programme for Environment and Climate Action (LIFE), which supports demonstration, best practice, coordination and support actions, capacity building, and governance projects.

This includes large-scale Strategic Integrated Projects and Strategic Nature Projects, which support the implementation of environmental and climate plans, as well as programmes and strategies developed at regional, multi-regional or national level.

It is assumed that 60% of the budget can be deflated by wage increases (HICP), and 20% each by construction and machinery prices.

3.1.4 Migration and Border Management

Cluster 10 – Migration

Over the whole MFF period, nearly 90% of the budget planned under this cluster is covered by the Asylum, Migration and Integration Fund. The invasion of Russia into Ukraine aggravated the budgetary stress on this fund. Expenditure under this cluster is largely on items similar to those covered by the HICP (we assume 60%). Furthermore, integration measures are usually labour intensive, so around 30% are assumed for wages which follow HICP increases with a delay of one year.

Cluster 11 – Border Management

This cluster is of a similar size as Cluster 10. Border control is mostly labour intensive with some investment into technical terminals and observation investment. We assume that 70% of the overall budget are spent on personnel, 20% on technical equipment, and 10% on construction.

3.1.5 Security and Defence

Cluster 12 – Security

This cluster covers expenditure on internal security issues as well as the decommissioning of nuclear facilities and the management of radioactive waste. It is reasonable to assume that half of the budget is spent on wages and the rest in equal shares on construction and machinery investment.

Cluster 13 – Defence

Like cluster 12, defence is a relatively small budgetary item with a share of less than 0.2% of the total MFF. Again, it is assumed that half of its expenditures are spent on construction and half on machinery investment.

3.1.6 Neighbourhood and the World

Cluster 14 – External Action

This cluster consists mainly of the *Neighbourhood, Development and International Cooperation Instrument* (NDICI) (66%) and *Humanitarian Aid* (HUMA) (28%). Expenditure is expected to be mainly of consumption type (60%), while wages for personnel (20%) as well as construction (10%) and machinery purchases (10%) should play a minor role only.

Cluster 15 - Pre-Accession Assistance

Expenditure under this cluster is determined for supporting administration in accession countries. It is plausible to assume that these funds are mainly used for staff and some investment in technical equipment. Therefore, the weight for the deflator wage increases is assumed to be 60% and 40% of machinery investment.

3.1.7 European Public Administration

This heading covers expenditure of the EU institutions on wages and materials. We assume that 70% of this budget are used for wages and are therefore deflated by wage increases, 15% by machinery, 10% by construction prices and 5% energy expenditure as included in the Belgian HICP. EU Regulation No. 31 (EWG) 11 (EAG) stipulates that wages must be adjusted according to the Belgian and Luxembourgian HICP inflation rate observed between June of the current and the preceding year. Here we apply only the annual HICP of Belgium with the delay of one year, as the difference to the Luxembourgian HICP should not be substantial and the envelope for the European Public Administration accounts for less than 7% of the total budget.

Table 3 provides an overview of the assumed weights applied to various price series by cluster. Different prices are applied for each cluster to better reflect the structure of the MFF expenditure items. A more detailed level of budget items than clusters only reveals the names of the funds for which the money is earmarked but not if it is used for investment purposes of construction or machinery or the payment of wages. Therefore, we had to make assumptions concerning the most plausible composition regarding spending purposes within clusters. Even though this constitutes an arbitrary process, the assumptions are more plausible than using the HICP as a general deflator for all clusters.

It is worth mentioning that for Cluster 6, which includes mainly debt servicing payments, the weights do not sum up to 1 as usual, but a 5% weight is applied for wages and machinery each. The other 90% covering the debt service payments have no price change which drives down the total price change of this cluster.

Table 3: Weights for price series according to MFF budget clusters

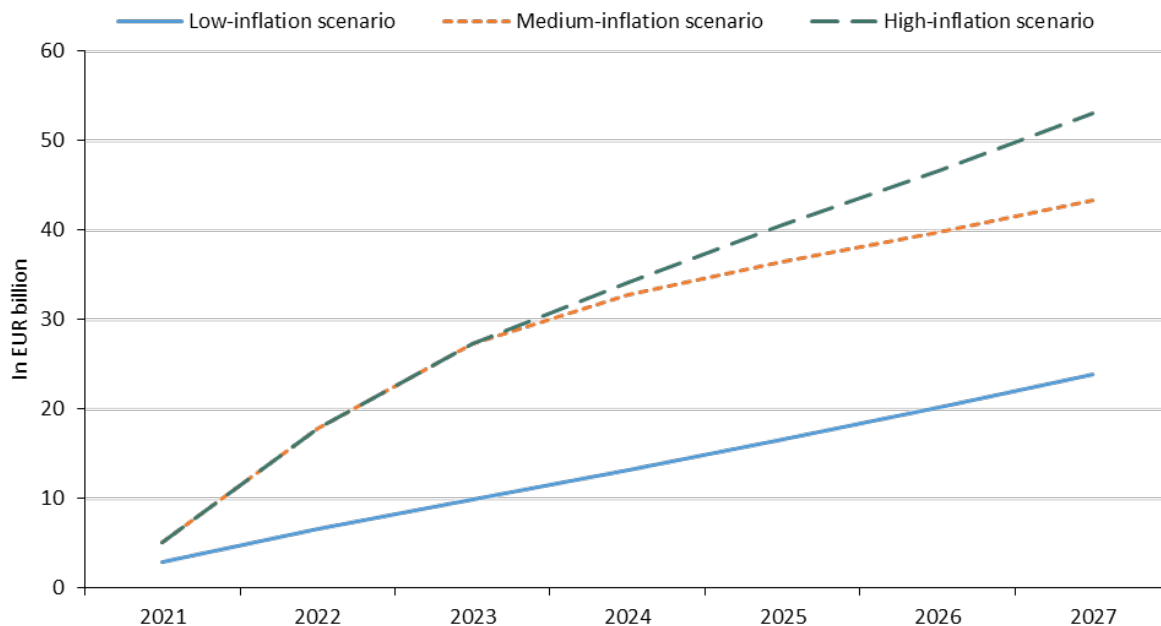
| European Union | Cluster | | | | | | | | | | | | | | | Public Admin. | SEAR |
|---------------------------|------------|----|----|----|---|----|----|----|----|----|----|----|----|----|----|---------------|------|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | | |
| | In percent | | | | | | | | | | | | | | | | |
| EU HICP All Items | . | . | . | . | . | . | 50 | 70 | . | 70 | . | . | . | 60 | . | . | 70 |
| EU Wages | 40 | 10 | 80 | 30 | 5 | 10 | 50 | | 60 | 40 | 70 | 50 | | 20 | 60 | | 20 |
| EU Construction | 20 | 45 | | | | 60 | | 15 | 20 | | 10 | 25 | 50 | 10 | | 10 | |
| EU Machinery ¹ | 40 | 45 | 20 | 70 | 5 | 30 | | 15 | 20 | | 20 | 25 | 50 | 10 | 40 | 15 | 10 |
| Belgium HICP | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 70 | . |
| Belgium HICP Energy | . | . | . | . | . | . | . | . | . | . | . | . | . | . | . | 5 | . |

Source: Own calculations. – ¹ EU Machinery is the EU 27 residual of National Accounts gross fixed capital formation excluding construction. It is used here for deflating expenditure on machinery investment.

To show the sensitivity of the results of the inflation adjustment procedure, we compile three different inflation scenarios. The first one is a low-inflation scenario which (as the MFF nominal adjustment) assumes a price increase over all clusters of 2% per year.

Our medium-inflation scenario is based on the more realistic inflation scenarios as given in Table 1 combined with the weights of Table 3, differentiated by clusters. The high-inflation scenario is the identical to the medium-inflation scenario, however, all price increases are augmented by 1% for 2024 and 2% for the ensuing years.

Figure 7: Loss per year



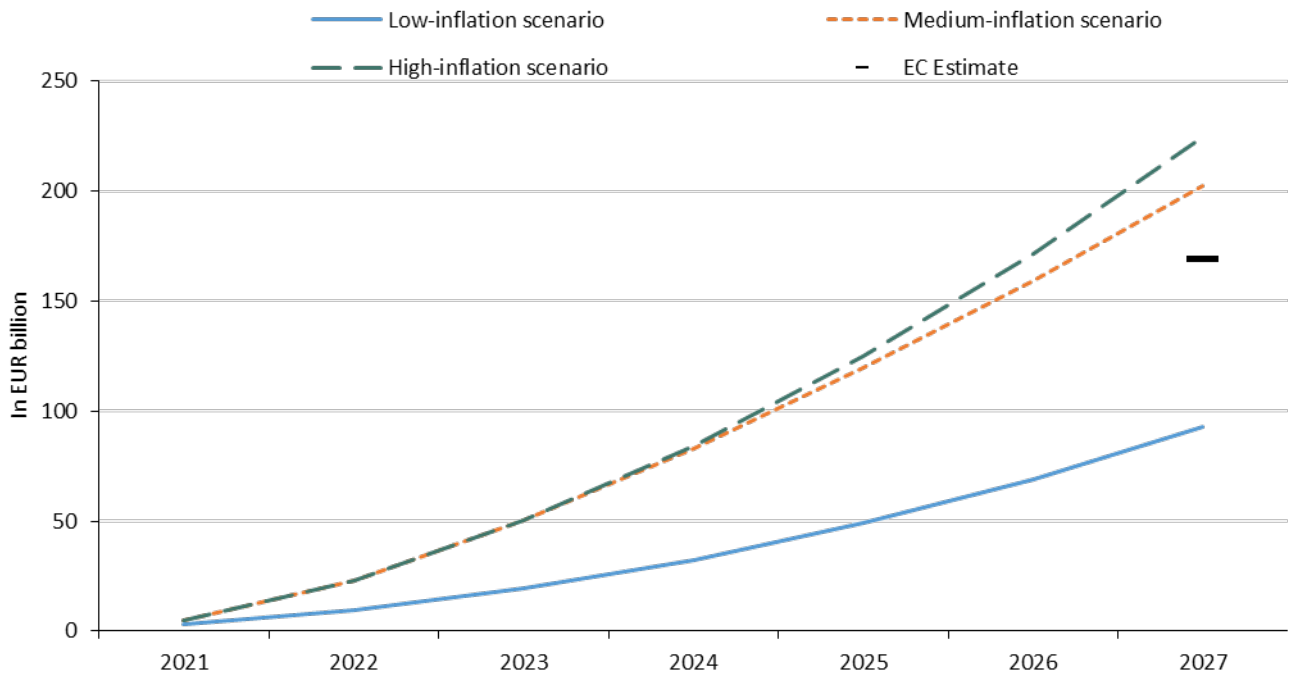
Source: Own calculations, European Commission.

The low-inflation scenario with an annual price increase of 2% shows a cumulated loss of purchasing power after 7 years (in 2027) of EUR 92.9 billion, which means a reduction of the purchasing power of 7.7%⁸ of the total budget summed over all the years without inflation.

The medium-inflation scenario during the years 2021 – 2023 shows higher price changes than the low-inflation scenario. Towards the end of the MFF period, however, the deflators for several subheadings fall below 2%. But as the price level increases at a much larger extent in the starting period, a substantial overall loss of purchasing power emerges. **This loss** at EUR 202.4 billion is higher by EUR **109.5 billion** compared to the low-inflation scenario as factored in and compensated by the automatic 2% deflator in the MFF. It also surpasses the additional loss due to the inflation hike of EUR **74 billion as published by the Commission in June 2023** (European Commission, 2023a), which is marked as a black line in 2027 in Figure 8.

⁸ The loss in 2027 – after 7 years with a 2% inflation rate – alone equals a reduction of purchasing power of 13.2% which is calculated as $(1 - 0.02)^7 - 1$.

Figure 8: Cumulated loss



Source: Own calculations, European Commission.

In the high-inflation scenario, where 2024 price increases were augmented by a further 1 percentage point in 2024 and 2 percentage points in the years until 2027, the loss rises to EUR 224.5 billion. This is EUR 131.6 billion higher than in the low inflation scenario and EUR 22.0 billion higher than in the medium-inflation scenario.

As a result, the more realistic medium-inflation scenario shows an additional loss on top of the amounts already factored in and compensated by the 2% deflator in the low-inflation scenario (as included in the MFF) of nearly EUR 109.5 billion. This loss is higher than the EUR 74 billion recently expected by the Commission (European Commission, 2023a), where expenditures are not inflated by the HICP but by assumptions on the future development of the GDP deflator.⁹

When observing the cumulated losses for detailed headings and clusters, remarkable differences in the loss of purchasing powers across Clusters can be observed. The smallest relative loss is incurred in Cluster 6 where the RRF is included. As the by far largest part of expenditure is used for servicing the debts of the NGEU fund, only a small part is spent on items which are affected by a loss of purchasing power due to a higher inflation rate.

The largest relative losses can be observed in those clusters which are deflated either by the HICP itself or wage increases closely related to them with some delay. These are Cluster 5 “Regional Development and Cohesion”, Cluster 10 Migration and Border Management, and Heading 7 European Public Administration.

⁹ See European Commission (2023a) footnote 36.

Table 4: Inflation induced losses in the MFF according to clusters (medium-inflation scenario)

| Heading and Cluster | MFF 2021-2027 | | |
|--|------------------|-----------------|--------------|
| | Current prices | Loss | |
| | In EUR million | | in% |
| 1. Single Market, Innovation and Digital | 148,455 | -10,092 | -6.8% |
| 1. Research and Innovation | 93,721 | -6,395 | -6.8% |
| 2. European Strategic Investments | 32,977 | -2,669 | -8.1% |
| 3. Single Market | 6,604 | -420 | -6.4% |
| 4. Space | 15,153 | -608 | -4.0% |
| 2. Cohesion, Resilience and Values | 426,389 | -39,426 | -9.2% |
| 5. Regional Development and Cohesion | 274,265 | -27,752 | -10.1% |
| 6. Recovery and Resilience | 21,397 | -49 | -0.2% |
| 7. Investing in People, Social Cohesion and Values | 130,727 | -11,625 | -8.9% |
| 3. Natural Resources and Environment | 400,703 | -38,203 | -9.5% |
| 8. Agriculture and Maritime Policy | 386,221 | -37,071 | -9.6% |
| 9. Environment and Climate Action | 14,482 | -1,132 | -7.8% |
| 4. Migration and Border Management | 25,473 | -2,374 | -9.3% |
| 10. Migration | 11,105 | -1,278 | -11.5% |
| 11. Border Management | 14,368 | -1,095 | -7.6% |
| 5. Security and Defence | 14,240 | -1,197 | -8.4% |
| 12. Security | 4,597 | -371 | -8.1% |
| 13. Defence | 9,643 | -826 | -8.6% |
| 6. Neighbourhood and the World | 109,915 | -9,438 | -8.6% |
| 14. External Action | 95,751 | -8,668 | -9.1% |
| 15. Pre-accession assistance | 14,164 | -770 | -5.4% |
| 7. European Public Administration | 82,474 | -8,776 | -10.6% |
| TOTAL | 1,207,649 | -109,507 | -9.1% |

Source: Own calculations, Council of the European Union:
https://www.consilium.europa.eu/media/47567/mff-2021-2027_rev.pdf.

As already mentioned, some items included in MFF clusters are not (directly) subjected to a loss in purchasing power. This is foremost the servicing of debts of the NGEU fund as included in Cluster 6. This kind of expenditure is not subjected to a loss of purchasing power but requires increased spending due to the changed situation on financial markets.

A further item experiencing indirectly a loss in purchasing power is heading 7 European administration, the largest part of which is used to settle the wages of staff employed in the European institutions. It is included in Table 4 because the equivalent sum of money can only cover a reduced staffing cost or savings in other administrative expenditure have to be made.

If the scope is not limited to losses to the MFF budget, but to the whole impact of the reduction in purchasing power, losses will be bigger. First of all, the loss of purchasing power of NGEU is not

included in this amount¹⁰. Second, the co-financing means, which have to be provided by the Member States, as well as the means covered by grants are also affected by a loss in purchasing power. Insofar, the **total loss figure given here marks the lower boundary**.

In its mid-term review of the MFF (European Commission, 2023a), the Commission proposed an increase of funds for various headings for the remaining time span from 2024 to 2027. As these proposed top-ups are given in 2018 prices, we inflate them to current prices as depicted in the lower panel of Table 5.¹¹

If we compare Table 6 with the proposed increases as shown in Table 5, we still observe an overall loss of purchasing power. **However, the top-ups proposed by the Commission would decrease the inflation-induced loss of purchasing power from EUR 109.5 billion to EUR 82,0 billion. This corresponds to a reduction of the loss in purchasing power due to the higher inflation from 9.1% to 6.8%.**

Table 5: Top-ups proposed in the Commission MFF midterm review in 2018 and current prices

| Commission mid-term review proposal | 2018 prices in EUR million | | | | |
|--|-------------------------------|-------|-------|-------|--------|
| Heading | 2024 | 2025 | 2026 | 2027 | Sum |
| 1. Single Market, Innovation and Digital | 777 | 762 | 748 | 733 | 3,020 |
| 2. Cohesion, Resilience and Values | 0 | 0 | 0 | 0 | 0 |
| 3. Natural Resources and Environment | 1,110 | 1,088 | 1,067 | 1,046 | 4,311 |
| 4. Migration and Border Management | 0 | 264 | 464 | 965 | 1,693 |
| 5. Security and Defence | 333 | 327 | 320 | 313 | 1,293 |
| 6. Neighbourhood and the World | 2,331 | 2,286 | 2,241 | 2,198 | 9,056 |
| 7. European Public Administration | 132 | 333 | 556 | 600 | 1,621 |
| TOTAL | 4,683 | 5,060 | 5,396 | 5,855 | 20,994 |
| | Current prices in EUR million | | | | |
| | 2024 | 2025 | 2026 | 2027 | Sum |
| 1. Single Market, Innovation and Digital | 984 | 987 | 988 | 988 | 3,946 |
| 2. Cohesion, Resilience and Values | 0 | 0 | 0 | 0 | 0 |
| 3. Natural Resources and Environment | 1,405 | 1,409 | 1,409 | 1,409 | 5,632 |
| 4. Migration and Border Management | 0 | 342 | 613 | 1,300 | 2,255 |
| 5. Security and Defence | 422 | 423 | 423 | 422 | 1,689 |
| 6. Neighbourhood and the World | 2,951 | 2,960 | 2,960 | 2,961 | 11,832 |
| 7. European Public Administration | 167 | 431 | 734 | 808 | 2,141 |
| TOTAL | 5,928 | 6,552 | 7,127 | 7,888 | 27,495 |

Source: Own calculations, European Commission.

¹⁰ A more detailed analysis will be provided in part 2 of the study.

¹¹ This time we did not break it down by clusters, but the HICP rates as included in Table 1 have been used, extended by the years 2019 and 2020 of the realised HICP increases for the total EU of 1.4% and 0.7%, respectively.

Table 6: Comparison of inflation-induced losses before and after MFF top-ups proposed in the Commission MFF midterm review

| Loss in purchasing power 2021-2027 | Loss | | Proposed increase | Loss new | |
|--|----------------|--------|-------------------|----------------|-------|
| | In EUR million | In % | In EUR million | In EUR million | In % |
| 1. Single Market, Innovation and Digital | -10,092 | -6.8% | 3,946 | -6,147 | -4.1% |
| 2. Cohesion, Resilience and Values | -39,426 | -9.2% | 0 | -39,426 | -9.2% |
| 3. Natural Resources and Environment | -38,203 | -9.5% | 5,632 | -32,571 | -8.1% |
| 4. Migration and Border Management | -2,374 | -9.3% | 2,255 | -119 | -0.5% |
| 5. Security and Defence | -1,197 | -8.4% | 1,689 | 492 | 3.5% |
| 6. Neighbourhood and the World | -9,438 | -8.6% | 11,832 | 2,394 | 2.2% |
| 7. European Public Administration | -8,776 | -10.6% | 2,141 | -6,635 | -8.0% |
| TOTAL | -109,507 | -9.1% | 27,495 | -82,012 | -6.8% |

Source: Own calculations.

While the increases proposed by the Commission concern all budget headings except Heading 2 “Cohesion, Resilience and Values”, according to the proposal some of them would experience a substantial expansion of funds. “Migration and Border Management” would experience only a slight loss in purchasing power of 0.5%. “Security and Defence” and “Neighbourhood and the World” would even gain an increase of funds in real terms.

Conclusions

An inflation rate above the 2% assumed in the ongoing MFF **reduces the real volume and impact of pre-allocated funds via reducing their purchasing power**. While this does not cause budgetary pressures, **the affected funds cannot reach the envisaged objectives in full** (European Court of Auditors, 2023). In contrast, **budgetary constraints** arise under cluster 15 **European Administration, as rising wages, pension payments**, and non-personnel expenses (e.g., for energy, rents, etc.) cannot be covered by the amounts budgeted and therefore either **require additional funds or a reduction in the respective quantities** (e.g., number of staff, amount of energy purchased or spatial needs of European institutions). Budgetary pressures also result from considerably **higher than expected interest payments related to EU debt taken up to finance NGEU** under cluster 6 in heading 2. Keeping heading 2 ceilings constant **would result in the need to cut important spending programmes like Erasmus+ or EU4Health** (Claeys et al., 2023). In addition, inflation above 2% reduces the purchasing power of the flexibility provisions, i.e., the unallocated margins, the thematic special instruments, and the Flexibility Instrument, thus eroding the capacity of the MFF to react to unexpected developments (European Court of Auditors, 2023).

The medium-inflation scenario shows an **additional loss** on top of the 2% loss already factored in and compensated by the 2% automatic deflator in the MFF (low-inflation scenario) on which the ongoing MFF is based **of nearly EUR 109.5 billion. This loss is considerably higher than the EUR 74 billion as recently estimated by the Commission** (European Commission, 2023a).

The budget increases proposed by **the Commission in its mid-term review would cushion the overall loss in purchasing power** due to the strong price increase from EUR 109.5 billion to around EUR 80 billion. **Some headings** (“Security and Defence”, “Neighbourhood and the World”) **would even**

experience an increase in real terms. Within the heading “Migration and Border Management” the loss would be compensated by the proposed additional funds.

Extending the analysis to the whole impact of inflation on the EU budget’s purchasing power would yield even larger losses. First of all, the loss of purchasing power of NGEU is not included in this number. Second, the co-financing means which need to be provided by the Member States, as well as the means covered by grants are also affected by a loss in purchasing power. Insofar, the **total loss figure estimated here marks the lower boundary.**

The **strong increase of the GDP deflator** can be expected to **decrease the volume of the MFF in percent of GNI until 2027 to 0.96%**, which is below the 1.05% of GNI envisaged when agreeing on the MFF 2021-2027.

3.2 Impact of inflation on the EU revenue system

Concerning the EU revenue system, inflation can be relevant in two ways. Firstly, it can have varying impacts on the growth of different revenue categories that fund MFF expenditures and the allocation of the financial responsibilities among Member States. Secondly, it is of interest if and to what extent the new own resources to be implemented to finance NGEU debt repayment and to replace a part of GNI-based own resources may be affected by inflation. Both aspects are explored in this section.

The impact of inflation on the structure of EU revenues is analysed through quantitative simulations for different scenarios, while potential effects on the envisaged new own resources are assessed qualitatively. We also briefly review other proposals for new own resources with a view to their responsiveness to inflation.

3.2.1 Impact of inflation on the current EU revenue system

The EU revenue system is based on several financing sources.¹² On average over the last few years, more than 90% of EU revenues consist of own resources (i.e., traditional own resources, the VAT-based own resource, the GNI-based own resource, and the Plastics Own Resource). The remaining revenues stem from other revenue and the balance carried over from the previous year. As grants and loans provided to Member States through NGEU are financed through EU debt, which also constitute other revenue of the EU, this position has been growing considerably since 2021 and somewhat distorts a long-term comparison of the weights of the different revenue sources. Therefore, the overall structure of EU revenues is illustrated in two figures below: Figure 10 displays the long-term development of EU revenues excluding and Figure 11 including other revenue.

Several of the EU’s revenue sources are susceptible to inflation, which affects individual revenue sources through various channels that are briefly explained in what follows.¹³ Generally, it is necessary to note that EU overall revenue growth is limited to 2% per year, as their overall volume is determined by overall MFF appropriations that are inflation-adjusted by 2% annually.

Traditional own resources comprise custom duties levied at the EU’s external border.¹⁴ They have been continuously losing in importance over time and make up for 16.6% of overall revenues (nearly EUR 26 billion) (10.5% of overall revenues including other revenue) in 2022. Duties are sometimes

¹² See Schwarcz (2021, 2023) and D’Alfonso (2021) for brief overviews, on which this section is based.

¹³ See for details of the design of the various EU revenues the latest Own Resource Decision (ORD) (European Commission, 2020).

¹⁴ With the end of the sugar quota system in the marketing year 2016/17, the sugar production tax and the surplus levy no longer apply as of 2018. Member States collecting these traditional own resources may keep 25% of revenues to cover their collection costs and to provide incentives for diligent collection of these duties.

linked to quantities imported into the EU (specific rates). In these rare cases, price increases of such products do not affect the nominal revenues from this source.¹⁵ The majority of custom duties, however, are levied at ad valorem rates (i.e., as a percentage of the nominal value of imported goods). In this case, inflation impacts custom duties through increased import prices, and revenues grow as well. Accordingly, the current high inflation should increase the share of custom duties based on ad valorem rates in overall EU revenues, while the share of custom duties based on specific rates decreases.¹⁶

The **VAT-based own resource** is calculated by applying a uniform call rate of 0.3% on Member States' estimated value added tax (VAT) revenues. If a country applies more than one VAT tax rate, a weighted average of the tax bases has to be used for calculating its contribution.¹⁷ The weights depend on the specific VAT rate and the size of its base. This means that the total tax base of a country is a weighted average of different bases augmented by their specific rates. Throughout the period 2021 – 2027 the weights are held constant to their 2016 sizes.¹⁸

To limit regressive effects of the VAT-based own resource, VAT bases of each Member State are capped at 50% of their GNI. This cap intends to avoid overburdening poorer Member States, where the aggregate consumption rate usually is higher than in richer Member States. Revenues from the VAT-based own resource contribute at about 12.6% (EUR 19.7 billion) to overall EU revenues (8.0% of overall revenue including other revenue) in 2022. Inflation expands the VAT base due to an increase of nominal consumption. Higher consumer prices as measured by the HICP will increase the tax bases as well as governments' revenues from the VAT. Member States with above average inflation rates are facing above average increases of their VAT-based own resource payments, as they experience such surges in their national budgets. Therefore, high inflation results in increasing shares of VAT-based own resources in overall EU revenues.

The newly implemented **Plastics Own Resource** raises revenues of EUR 6.3 billion (4.1% of overall revenues) (2.6% of overall revenue including other revenue) in 2022, the second year of its application. The Plastic Own Resource is levied at a rate of EUR 0.80 per kilogram non-recycled plastic packaging waste. Member States with a per capita GNI below the EU average receive a lump sum reduction corresponding to 3.8 kilograms of non-recycled plastic packaging waste per capita. High inflation reduces the real value of the call rate as well as the lump sum reduction, which are expressed in nominal terms (similar to a specific excise tax) and not inflation adjusted. Almost over the whole current MFF period, the amount of non-recycled plastic packaging waste is expected to remain rather constant (European Commission, 2018). Accordingly, the share of revenues from the plastic own resource will experience a decline, as overall EU revenues grow at 2% but the plastic own resource call rate is not adjusted by the 2% deflator. Indexing the call rate based on the actual inflation rate would increase the share of plastic own resource payments in overall revenues for actual inflation rates above 2%.

¹⁵ Or eventually even lower income from duties can emerge if the volume of imports shrinks to the higher unit price.

¹⁶ At the same time, all Member States collecting custom duties receive correspondingly higher revenues, as 25% of custom duties collected may be retained by the collecting Member States. These additional revenues are distributed rather unevenly, as four Member States (Germany, the Netherlands, Belgium and Italy) together collect more than half of overall EU custom duties (Baert, 2023).

¹⁷ Member States' VAT base is corrected only for territorial scope in the few cases foreseen in the Treaty and for infringements to the VAT directive.

¹⁸ See https://commission.europa.eu/strategy-and-policy/eu-budget/long-term-eu-budget/2021-2027/revenue/own-resources/value-added-tax_en.

Box 1: Differences and similarities of GDP and GNI

GNI is a measure closely related to Gross Domestic Product (GDP). While GDP measures the market value of a country's production within its borders, GNI measures the income from a country's production gained by its residents. GNI can be derived from GDP by adjusting for production income (wages and capital income like dividends and interests) from and to foreign countries. For large countries the difference between GNI and GDP can be usually neglected. For smaller countries, numbers can make some difference, however. In fact, this own resource taxes not the production activity of an area but more the income of its residents. As there exists no deflator for GNI the GDP deflator is used in practice for price adjustment of GNI.

The **GNI-based own resource** is calculated by applying a uniform call rate on Member States' gross national income (GNI). It represents the residual revenue source: the call rate is determined annually so as to cover the financing gap resulting from the difference between the revenues from the other revenue sources and the funding needed for MFF expenditures. Despite its nature as residual revenue source, the GNI-based own resource has become the quantitatively most important revenue source, contributing EUR 103.9 billion (66.7% of overall revenues) (42.4% of overall revenues including other revenue) in 2022. The call rate required to secure the necessary funding for EU expenditures *ceteris paribus* will be lower due to inflation as its base (Member States' GNI) is raised by inflation.¹⁹

Box 2: Relation between the HICP and the GDP deflator

The HICP index measures the price increase of a representative basket of consumer goods and services. It encompasses only consumer goods, irrespective of whether they are produced domestically, in the EU or outside. The GDP deflator, on the contrary, measures the price increases of only domestically produced products. It covers products and services, irrespective whether these products are used for consumption, investment or exported. Both indexes overlap only for domestically produced consumer goods.

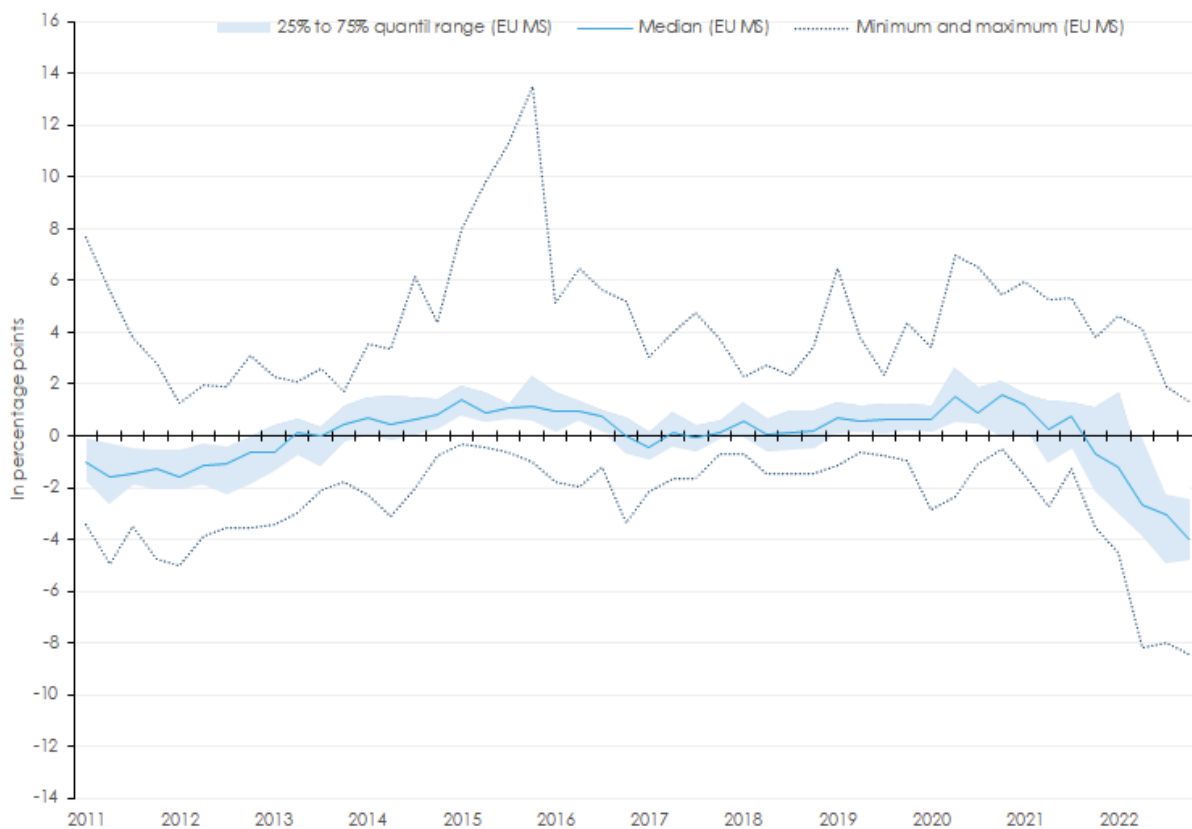
If a price increase originates from countries outside the EU, as it was the case in the recent surge in fossil energy products, this will affect first of all consumer products related to this (e.g., gasoline, natural gas for household heating). After some time, it can be observed that such increases spill over to domestically produced products, as companies pass on such price increases to domestically produced products. In this scenario, the GDP deflator will follow the HICP increase with some time lag. The extent and speed of the pass-through effect depends mostly on the industrial structure of a country and its openness.

Moreover, an indirect effect of inflation on the GNI-based own resource results if the weight of revenues stemming from the other revenue sources increases in overall revenues: As the financing gap is narrowed as a consequence, the amount that needs to be raised as GNI-based own resource and thus also the call rate are reduced.

In 2022, the EU GNI increased not only due to a vivid economic recovery but also through an increase of the GDP deflator. However, for most Member States this increase was lower than HICP price increases as can be seen by the plotted difference between the GDP deflator and the HICP in Figure 9.

¹⁹ In this case the price changes to adjust for is not the HICP but the GDP deflator which is only loosely linked to the HICP changes.

Figure 9: Difference between GDP deflator and HICP across EU Member States



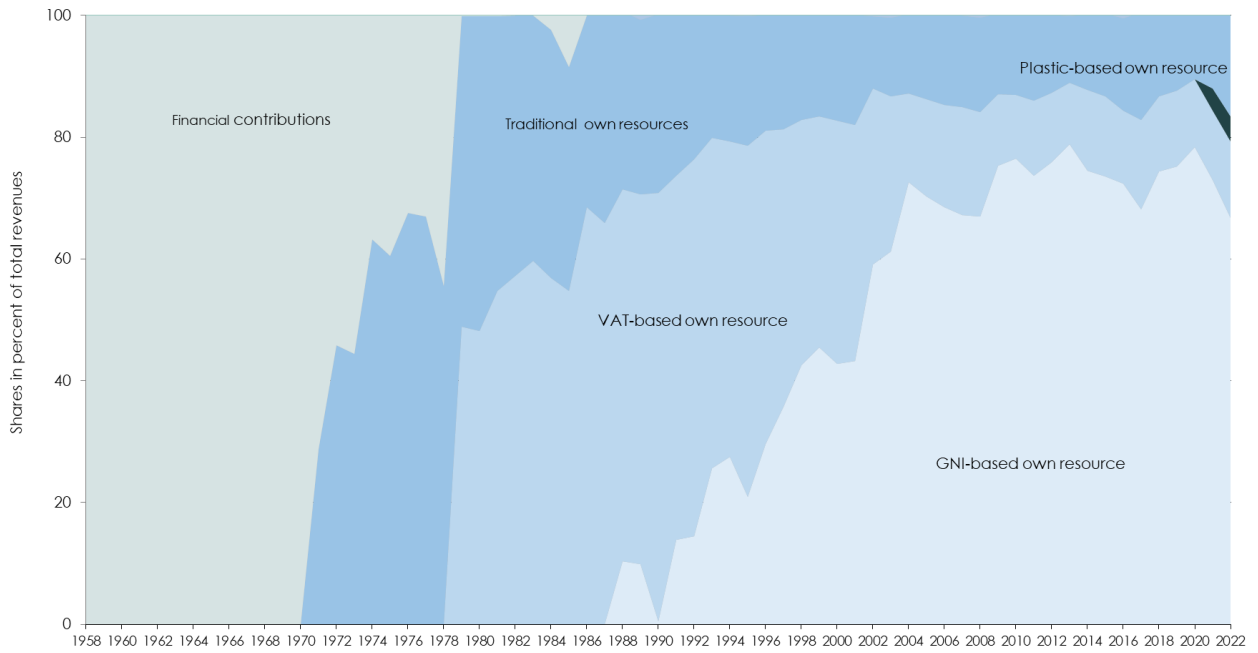
Source: IMF, Eurostat, Macrobond.

The **lump sum corrections** reducing the annual GNI-based contributions of Denmark (EUR 377 million p.a.), Germany (EUR 3.671 million p.a.), the Netherlands (EUR 1.921 million p.a.), Austria (EUR 545 million p.a.), and Sweden (EUR 1.069 million p.a.)²⁰ are inflation adjusted by applying the most recent GDP deflator for the EU. As the GNI-based own resource covers the remaining budgetary needs not covered by the sum of other EU revenues, an extraordinary increase of VAT-based own resources leads to an extraordinary reduction of GNI-based own resources. This overall reduction of the GNI-based own resource will increase the share of these lump sum corrections for the five Member States benefiting from them. In other words, rebates increase in relative terms.

Other revenue comprises taxes on the salaries of EU staff, contributions from non-EU countries to certain EU programmes, remaining EU contributions, fines, and EU borrowings (mainly for NGEU spending). To the extent that salaries of EU staff are adjusted to compensate for inflation, the base and accordingly revenues from taxes on salaries, and accordingly their share in overall EU revenues, will increase.

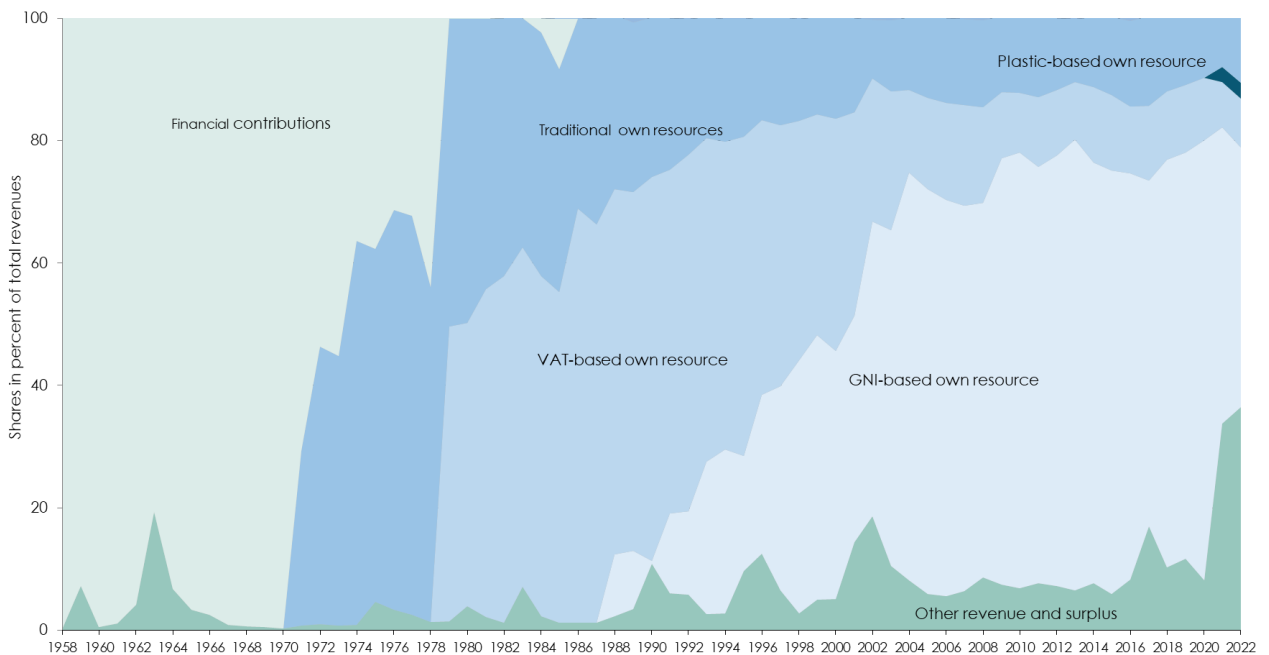
²⁰ In 2020 prices.

Figure 10: Composition of EU revenues in a long-term perspective, 1958 to 2022, excluding other revenue¹⁾ (Total Own Resources)



Source: European Commission (2023b), own representation. - ¹⁾ Other revenue includes taxes on the salaries of EU staff, contributions from non-EU countries to certain EU programmes, remaining UK contributions, fines, and EU borrowings.

Figure 11: Composition of EU revenues in a long-term perspective, 1958 to 2022, including other revenue¹⁾ (Total Revenue)



Source: European Commission (2023b), own representation. - ¹⁾ Other revenue includes taxes on the salaries of EU staff, contributions from non-EU countries to certain EU programmes, remaining UK contributions, fines, and EU borrowings.

Table 7: The impact of inflation on EU revenues

| Revenue source | Base | Rates/amounts | revenues in EUR billion 2022 | impact of inflation via... | Weight in overall revenues will... due to inflation |
|------------------------|--|---|------------------------------|--|--|
| VAT-based own resource | national VAT base | Call rate 0.3% | 19.7 | Increase of nominal domestic consumption | increase |
| Plastic own resource | non-recycled plastic packaging waste annual lump sum reduction of 3.8 kilograms of plastic packaging waste per capita for MS with per capita GNI below EU average | Call rate 0.80 € per kilogram of non-recycled plastic waste | 6.3 | Erosion of real value of (not inflation adjusted) call rate Erosion of real value of (not inflation adjusted) annual lump sum reduction | decrease |
| Custom duties | customs on imports from third countries complex system of differentiated, mostly ad valorem rates | 75% of revenues from custom duties collected by Member States ²⁾ | 25.9 | Increase of nominal value of imports for custom duties based on ad valorem rates Erosion of real value of revenues from custom duties based on specific rates | increase (for part of custom duties based on ad valorem rates) decrease (for part of custom duties based on specific rates) |
| Other revenue | taxes on the salaries of EU staff, contributions from non-EU countries to certain EU programmes, remaining UK contributions, fines, and EU borrowings | - - | 89.5 | Increase of salaries of EU staff erosion of real value of (not inflation adjusted) contributions from non-EU countries to EU programmes | increase/ decrease |
| GNI-based own resource | national GNI | call rate fixed annually in % as residual | 103.9 | increasing weight of VAT-based own resource and traditional own resources | decrease |
| Lump sum corrections | Lump sum corrections of GNI-based own resource payments for Denmark, Germany, the Netherlands, Austria, Sweden | Denmark EUR 377 million p.a. Germany EUR 3.671 million p.a. The Netherlands EUR 1.921 million p.a. Austria EUR 545 million p.a. Sweden EUR 1.069 million p.a. ¹⁾ | 0.02 | Adjustment based on EU GDP deflator | n.a. ³⁾ |

Source: European Commission (2023b), D'Alfonso (2021), Schwarcz (2021, 2023), own representation. – ¹⁾ In 2020 prices. – ²⁾ 25% of revenues from custom duties may be retained by collecting Member States. – ³⁾ The volume of lump sum corrections will increase relative to the volume of revenues from the GNI-based own resource overall, but also for the 5 Member States granted a lump sum correction.

Inflationary developments result in a structural shift within EU revenues. Their overall volume is determined by MFF expenditures, whose nominal growth is limited to 2% annually independent of actual inflation (Padilla Olivares, 2023). Therefore, revenues growing at a higher rate due to inflation will contribute increasing shares, while the weight of revenues growing at a lower rate will decrease. More precisely, this implies that the shares of the VAT-based own resource, custom duties based on ad valorem rates, and taxes on EU staff salaries can be expected to grow after 2021, while the share of the GNI-based own resource will shrink in a high inflation environment. The share of the plastic own resource will decrease in any case if the call rate is not adjusted based on the 2% deflator or the actual inflation rate. The revenues from the remaining elements of other revenue, which are independent of inflation, will not be influenced by higher inflation, so that their shares will decrease.

The considerations above show that it is predominantly the revenue from import duties and the VAT-based own resource and some (minor) elements of other revenue which are driven upward by higher inflation,²¹ while revenue stemming from the plastic own resource and from the remaining items falling under other revenue will not react to inflation. As the direction of the overall effect of inflation on import duties is unclear and their relative size in total revenues is rather small, it could be assumed that their effect on the distribution of the financial burden among Member States is approximately neutral. As the position “other revenue” cannot be directly attributed to individual Member States, the potential shift in the distribution of the financial burden among Member States due to inflation primarily pertains to the VAT- and GNI-based own resources.

Although inflation will drive up Member States’ own resource bases, this will not provide room for covering higher expenses, as the total budget of the EU is expenditure driven. **That means that higher revenues resulting from inflation will end up in a lower remaining amount to be covered by the GNI-based own resource. Consequently, Member States’ GNI-based own resource payments will decrease according to their national incomes.**

We do not provide a forecast of individual Member States’ VAT- and GNI-based own resource contributions for two reasons:

- Inflationary pressure cannot be singled out by just deducting an inflation rate of nominal variables (which form the basis of own-resource contributions) as inflation influences also real values. To capture such interdependencies, a fully-fledged macroeconomic model on a detailed country basis would be necessary. As such models are based on historical observations, even in this case results can be unreliable as such unprecedented price rises can have nonlinear effects.
- To understand the isolated effects of inflation on the contributions and their distribution among Member States, a simulation model is more appropriate.

To show the isolated effect from a rise of inflation and a change of the GDP deflator, we run a simulation based on the already (tentative) realised resources and their allocation for 2022. Starting from these results, we assume in our baseline scenario for all Member States that no real growth of the VAT tax base takes place in 2023, but that only an inflation rate of 2% increases all tax bases in nominal terms.²²

Furthermore, also the GNI of all Member States will increase by 2%, which is due to an increase in the GDP deflator. Thus, we assume no real growth and that both own resource bases are only driven by

²¹ Alone in 2022, these traditional own resources increased by nearly 36%.

²² For simplicity, it will be assumed that the HICP influences Member States’ individual VAT tax bases similarly, although small differences can emerge in real life as usually lower tax rates are applied for food, rent or energy. Furthermore, we do not account for the fact that some Member States’ VAT bases may reach the threshold of 50% of GNI. This would lead to a cap of such contributions. This limitation should not change the general logics of the simulation, however, as no specific Member State is addressed.

price increases. All other contributing revenue sources are kept constant over 2023. As we focus on the MFF without NGEU, we have to clear some revenues which are meant for financing NGEU. This regards the item "Other revenue and surplus" which has increased considerably since 2021 due to EU borrowings. As a large part of it is not dedicated to finance MFF programmes not funded by NGEU, we hold it constant at the 2020 level.

3.2.1.1 Simulation I: Cross-country differences in VAT base increases

In the first step of our simulation exercise, we do not consider the lump sum corrections granted to five Member States mentioned above.

If we increase in such a setting the VAT base of only one Member State of the size of Germany by a further 4%, to simulate an inflation rate of 6%, the following changes emerge:

- The treated Member States' tax base increases by 6% instead of 2%, and, as there is a constant call rate of 0.3%, also the VAT-based own resource contribution of this country increases by 6%.
- In absolute terms, if this Member State was Germany, the VAT-based own resource payment would increase to EUR 290.3 million instead of just EUR 96.8 million.
- The share of this Member State in total VAT-based own resource revenues would increase from 24.6% to 25.3% and slightly decrease accordingly for all other Member States.
- As the contribution to the revenues from the VAT-based own resource of the treated Member State rose from EUR 96.8 million to 290.3 million and overall expenditures have not changed, the remaining amount to be covered by the GNI-based own resource got reduced by EUR 193.5 million, which corresponds to a reduction of 0.7% .
- As by assumption the GNI of all Member States has uniformly grown by 2% in that year, their shares remain the same and all of them experience a reduction of their GNI-based own resource payments by 0.7%.²³

3.2.1.2 Simulation II: Cross-country differences in GNI deflator increases

The increase of the GDP deflator from 2% to 6% in one Member State will have the following effects:

- If neither the VAT tax base²⁴ nor the remaining amount to be covered by the GNI-based own resource would change, the only effect is that the treated Member State will have to pay a higher share of this own resource because its GNI has grown stronger as compared to the other Member States.
- If the EU's revenues from other revenue sources are kept constant in 2023 and having revenue from the VAT-based resources grown by 2% as in Simulation I above, there remains a residual to be covered by the GNI resource which is 2.5%²⁵ higher than in 2022. As long as the Member States' GDP deflators increase at the same rate, all Member States have to contribute 2.5% more than in 2022 with their shares remaining constant. If one Member State (again of the size of Germany) is treated by setting its deflator 4 percentage points higher than all other Member

²³ For the moment we do not consider lump sum corrections for any country.

²⁴ Due to the different nature of the GDP deflator and the HICP price index, this is theoretical possible in case that a country imports all consumption products and produces only investment products or exports all produced consumer products. In practice, the indexes show similar trends but differences and time lags in the size of price changes can be observed.

²⁵ For expenditures, there is an increase of 1.7% planned by the MFF for 2023. If "other revenues" are kept constant at their 2022 level and VAT bases revenues grow by 2%, the remaining gap to be covered by GNI based own resources is 2.5% higher than in 2022.

States, however, it experiences an increase of its share in its GNI-based own resource contribution from 25.3% to 26.1% (i.e., by 0.8 percentage points). Hence, the share of all other 26 Member States decreases by 0.8 points altogether.

- In absolute terms, this Member State would contribute now EUR 26.6 billion instead of EUR 25.9 billion,²⁶ which is an increase of 5.5% to the year before instead of 2.5%.
- The increase of the GDP deflator by 4 percentage points in the treated Member State led to an extra payment of this country of EUR 700 million. This is more than an extra payment originating from a 4 percentage point rise in consumer prices (EUR 193.5 million). This results from the fact that revenues from the GNI-based own resource are by far larger than from the VAT-based own resource (see Figure 10 and Figure 11).

3.2.1.3 Simulation III: Effects on rebates

After these simulations to demonstrate the effects of higher inflation separately for the VAT-based and the GNI-based resource²⁷, we scrutinise the mechanics of the lump sum corrections for some Member States (which act as a rebate) in combination with various price increases. These rebates will be financed by all other Member States, with their GNI contributions. Interestingly, these rebates as agreed on at 2020 prices will not be price adjusted using the GDP deflator of the specific Member State, but of the one for the whole EU. If the GDP deflator of a country eligible for a rebate grows less than the average of the whole EU, it sees its share in the GNI own resource shrinking. Its rebate is, however, not reduced as it is inflated by the total union's GDP deflator. We will simulate this effect in our third scenario.

In Table 8 we revalue the rebates quoted in 2020 prices to 2023 prices by applying a EU's GDP deflator rise of 2.4% in 2021 and 5.1% in 2022 as published by Eurostat.²⁸

Table 8: Lump sum corrections for GNI-based resources in 2020, 2022, 2023 prices

| | 2020 prices | 2022 prices | 2023 prices |
|-----------------|----------------|-------------|-------------|
| | In EUR million | | |
| Denmark | 377 | 406 | 424 |
| Germany | 3,671 | 3,951 | 4,125 |
| The Netherlands | 1,921 | 2,067 | 2,158 |
| Austria | 565 | 608 | 635 |
| Sweden | 1,069 | 1,150 | 1,201 |

Source: Own calculations.

Assuming a GDP deflator for Member States eligible for a lump sum correction of 2% and of 6% for the other Member States²⁹ results in an EU average of 4.4%. This 4.4% is used to revalue the lump sum corrections from 2022 prices to 2023 prices with the resulting price adjusted values given in Table 8.

²⁶ According to Simulation II, no lump sum correction is considered.

²⁷ Although in real life HICP and GDP inflation show up together with some time delays and leakage, theoretically they can be completely independent in case a country imports all its consumer products from abroad and uses all its domestic production for either investment or exports purposes.

²⁸ As per October 4, 2023.

²⁹ This scenario is taken just for demonstrating possible effects of having lump sum corrections not price adjusted by a country's GDP deflator but by the one of the whole EU. In fact, the GDP deflators of the countries eligible for a correction where in 2021, 2022 and probably also in 2023 located around the EU average. Large deviations were observed only for the other countries not eligible.

As we are here only interested in the redistribution of GNI-based own resource payments across Member States due to a different deflation of GNI (with the respective countries' GDP deflator) and the lump sum corrections (with the EU average GDP deflator), we hold the HICP deflator constant as in Simulation II (for all countries 2%), which leaves the total financial gap to be covered by the GNI-based own resource unchanged.

In a next step, GNI-based own resource contributions of Member States are compiled, the lump sum corrections for the five eligible Member States are deducted from their gross payment obligations, and the aggregate deducted amount (i.e. EUR 8,543 million) is distributed among the remaining Member States according to their GNI shares. The results of the simulation are displayed in Table 9.

Table 9: Simulation results per Member State

| | Share in GNI exclusive Rebate | | Share in GNI incl rebate scenario A | | Share in GNI incl. rebate scenario B |
|----------------|-------------------------------|--------|-------------------------------------|--------|--------------------------------------|
| | 2022 | 2023 | 2022 | 2023 | 2023 |
| Austria | 2.82% | 2.75% | 2.21% | 2.13% | 2.16% |
| Belgium | 3.50% | 3.55% | 3.98% | 4.04% | 4.01% |
| Bulgaria | 0.52% | 0.53% | 0.59% | 0.60% | 0.60% |
| Croatia | 0.42% | 0.43% | 0.48% | 0.49% | 0.49% |
| Cyprus | 0.16% | 0.16% | 0.18% | 0.18% | 0.18% |
| Czech Republic | 1.67% | 1.70% | 1.90% | 1.93% | 1.92% |
| Denmark | 2.47% | 2.41% | 2.06% | 2.00% | 2.02% |
| Estonia | 0.23% | 0.23% | 0.26% | 0.26% | 0.26% |
| Finland | 1.69% | 1.71% | 1.92% | 1.95% | 1.93% |
| France | 17.20% | 17.47% | 19.55% | 19.86% | 19.74% |
| Germany | 25.30% | 24.72% | 21.35% | 20.69% | 20.90% |
| Greece | 1.29% | 1.31% | 1.46% | 1.48% | 1.47% |
| Hungary | 1.04% | 1.06% | 1.19% | 1.21% | 1.20% |
| Ireland | 2.30% | 2.34% | 2.62% | 2.66% | 2.64% |
| Italy | 12.22% | 12.41% | 13.89% | 14.11% | 14.02% |
| Latvia | 0.24% | 0.25% | 0.28% | 0.28% | 0.28% |
| Lithuania | 0.41% | 0.41% | 0.46% | 0.47% | 0.47% |
| Luxembourg | 0.35% | 0.35% | 0.40% | 0.40% | 0.40% |
| Malta | 0.10% | 0.10% | 0.11% | 0.11% | 0.11% |
| Netherlands | 5.71% | 5.58% | 3.64% | 3.47% | 3.58% |
| Poland | 3.96% | 4.03% | 4.51% | 4.58% | 4.55% |
| Portugal | 1.49% | 1.52% | 1.70% | 1.72% | 1.71% |
| Romania | 1.76% | 1.79% | 2.00% | 2.03% | 2.02% |
| Slovakia | 0.68% | 0.69% | 0.78% | 0.79% | 0.78% |
| Slovenia | 0.37% | 0.37% | 0.42% | 0.43% | 0.42% |
| Spain | 8.42% | 8.55% | 9.57% | 9.72% | 9.66% |
| Sweden | 3.66% | 3.58% | 2.51% | 2.40% | 2.46% |

Source: Own calculations.

When comparing the shares of GNI contributions between 2022 and the simulated 2023, it can be clearly seen that the shares of the Member States eligible for a rebate shrank even before the deduction of rebates, as a lower GDP deflator (2%) was assumed than for the other Member States (6%), whose shares consequently increased. In scenario A, column 2023 shows how the deduction of rebates, inflated with the EU average GDP deflator, led to a further reduction of the shares of the Member States eligible for a lump sum reduction. In scenario B, which is given in the last column, lump sum rebates were not adjusted using the EU average GDP deflator, but the respective Member State's GDP deflator instead. It can be seen that in this case the eligible Member States would have to pay a higher share as their rebates were not revalued that generously. Hence, if a Member State eligible for a rebate experiences a lower GDP deflator than the EU average, it will not only contribute a lower share in the GNI-based own resource but also benefit from an extra reduction through the rebate.

Overall, the HICP inflation and GDP deflator changes on the distribution of own resource payments across Member States can be summarised as follows:

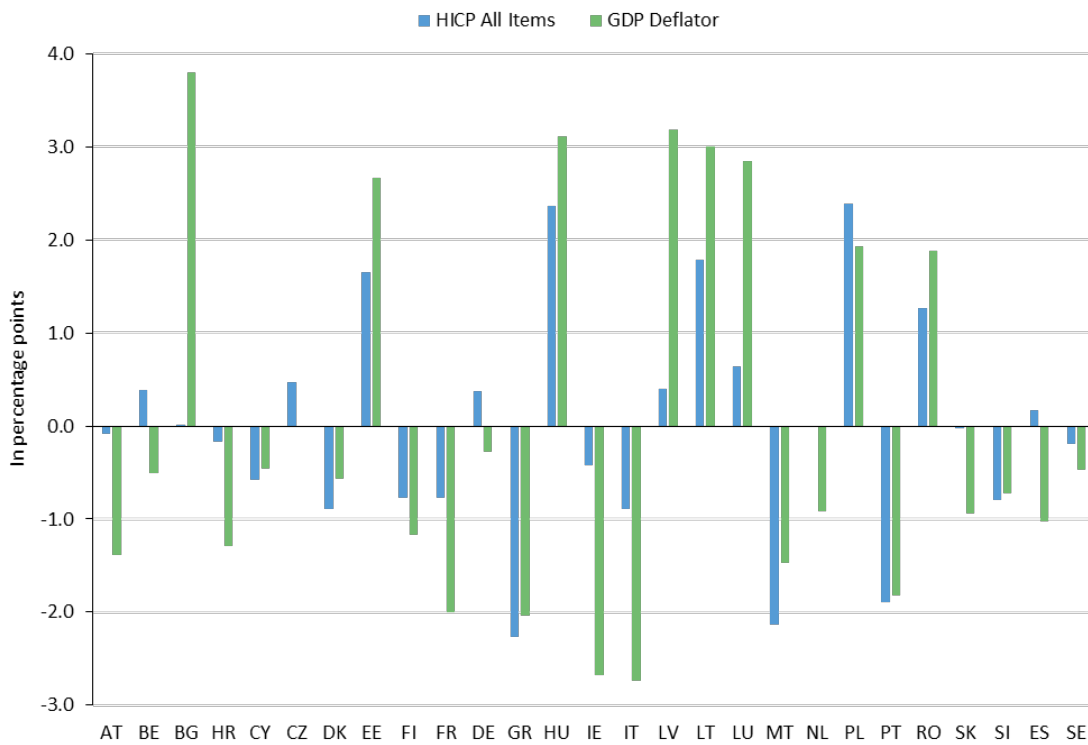
- An increase of the HICP in the EU - which is driven by price increases from imports of third countries - will increase revenues from the traditional own resources (i.e., from import duties) and hence lower the amount of EU revenues to be covered by Member States' contributions.
- An increase of the HICP in the EU increases revenues from the VAT-based own resource and decreases the residual amount to be covered by the GNI-based own resource.
- An increase of the HICP inflation rate in one Member State above the EU average increases the share of this Member State in overall VAT-based own resource payments and decreases it for all other Member States where HICP is below the EU average.
- An above EU average increase of the GDP deflator in one Member State increases the share of this Member State in overall GNI-based own resource payments and decreases it for other Member States where GDP deflators are below the EU average.

A Member State eligible for a rebate experiencing a GDP deflator below the EU average will not only contribute a lower share in the GNI-based own resource but additionally will get a higher rebate. This leads to a reduction beyond what would be the case with the normal GDP deflator for this Member State. In the previous considerations, the different effects of price increases on various components of EU revenues have been delineated. Definite conclusions regarding a shift in the overall payments attributed to a specific Member State can only be drawn when considering additional factors such as the overall growth in EU expenditure, which is necessary to calculate changes in absolute values.

It has been shown that the relative financial contribution to total VAT-based own resource payments is depending on deviations of the price deflator of private consumption parts which are subject to national VAT. If the value is above average, the share in VAT-based own resource payments of the respective Member State is increasing. This lowers GNI-based own resource payments for all other Member States. Similarly, if the GDP deflator of a Member State is above average, it will see its share in total revenues from the GNI-based own resource increase, irrespective of whether it is eligible for a lump sum correction.

Figure 12 shows for all EU Member States their deviations from the EU averages in HICP and GDP deflators in 2021. **Some Member States considerably exceeded the averages of both indicators: for instance, the three Baltic States, Hungary, Poland and Romania. Bulgaria experienced the largest increase above average in the GDP deflator and hence in the share of the GNI-based own resource. Member States below the average of both measures were Finland, France, Greece, Ireland, Italy, Malta and Portugal which experienced a decrease of their share in financing the total budget due to price changes.**

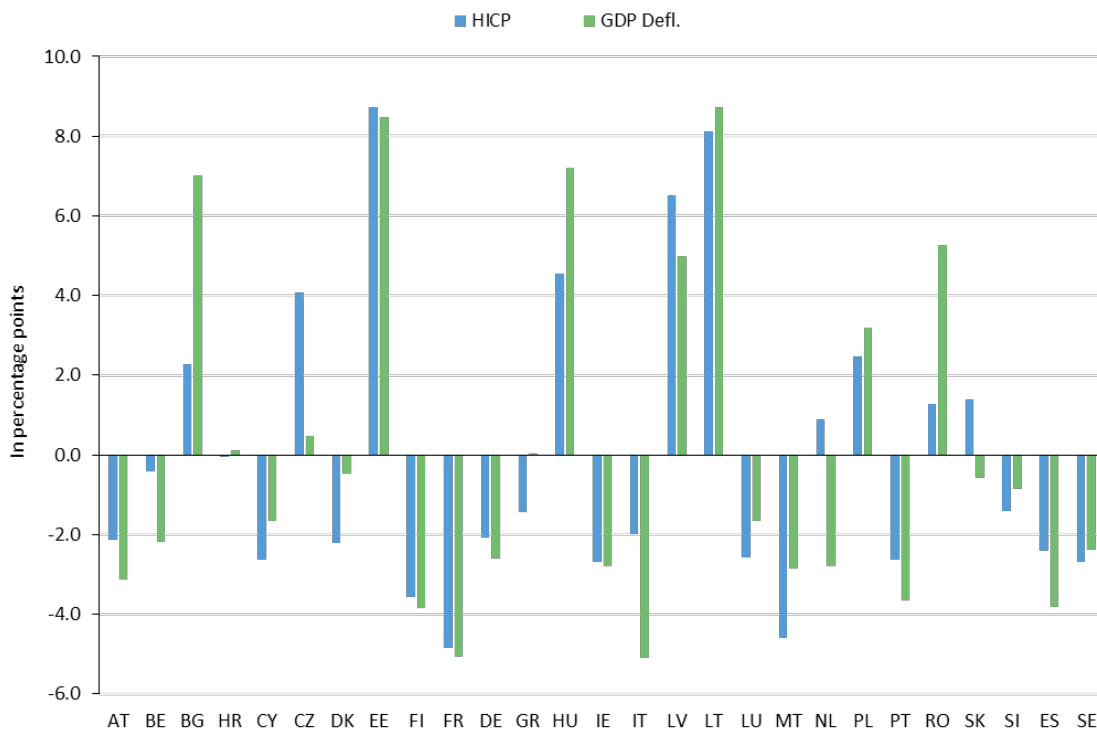
Figure 12: Deviation from the EU average in HICP and GDP deflators, 2021



Source: Eurostat, own calculations.

For the year 2022 the following distribution emerged.

Figure 13: Deviation from the EU average in HICP and GDP deflators, 2022



Source: Eurostat, own calculations.

In the following year 2022 Member States clearly above EU average regarding HICP and GDP deflator growth were Bulgaria and again the three Baltic States, and Hungary, Poland and Romania. This increased their shares in financing the overall EU budget once more. Finland, France, Italy and Malta were again below the EU average.

In order to investigate whether richer Member States experienced price increases below the EU averages, we plot Member States' deviations together with the GNI per capita at purchasing power parities.

Figure 14: Deviations EU Member States HICP from EU average

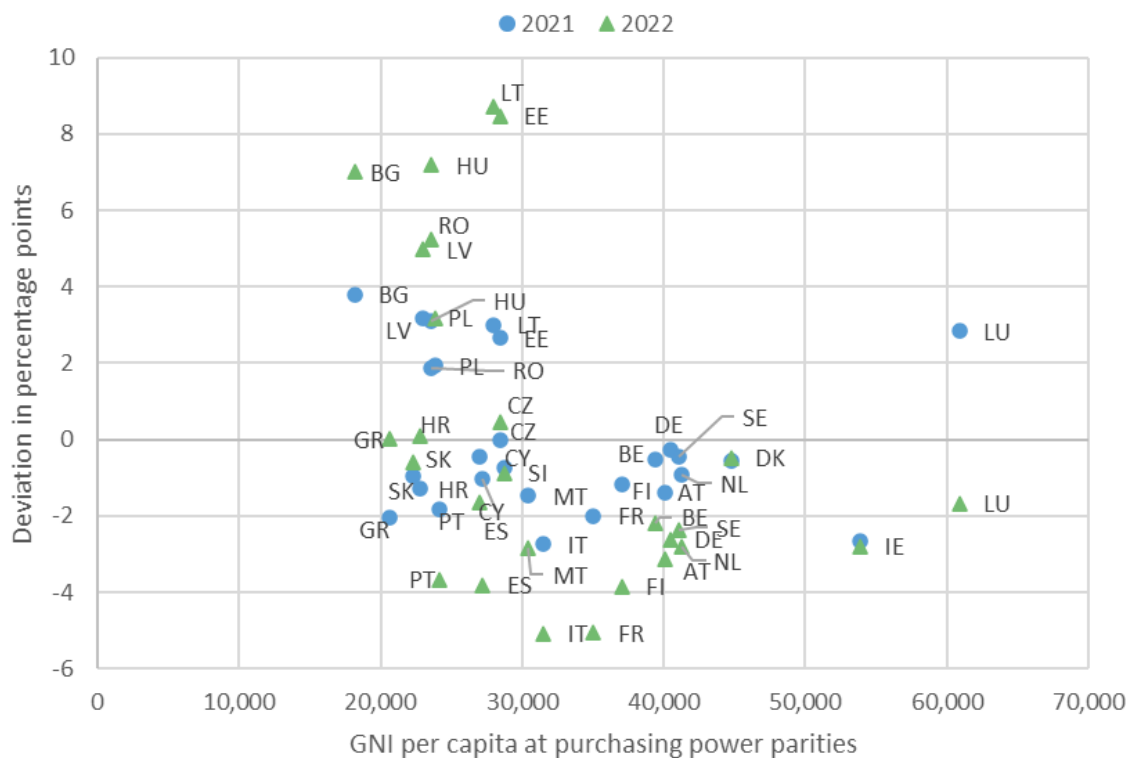


Source: Eurostat, own calculations.

For the deviations from average HICP we cannot observe a systematic correlation between a Member States' income (as measured by the GNI per capita in purchasing power parities) and its deviation from the EU average.

Likewise, a plot of the deviation in the GDP deflator together with this income measure does not reveal a systematic relationship between both.

Figure 15: Deviations of EU Member States' GDP deflator from the EU average



Source: Eurostat, own calculations.

Although no dependency of price deviations from national income could be found, some Member States incurred higher increases in their shares in VAT-based own resource payments and at the same time higher shares in GNI-based own resource payments due to a stronger price surge. Furthermore, many of those Member States experienced such decreases not only in 2021 but also in 2022 as Figure 14 and Figure 15 above reveal.

However, even a constant share in total GNI-based own resource payments does not mean an unchanged distribution according to national income. Any rise in total VAT-based resource payments reduces total GNI-based own resource payments. Hence, even if a Member State's share stays constant, its GNI-based own resource payment is reduced.

Although it might seem fair that even less wealthy Member States which benefit from an inflation-induced windfall profit regarding VAT revenues should contribute more to the EU's revenues from the VAT-based own resource, it needs to be borne in mind that this implies an additional drain of purchasing power for the Member State's population.

3.2.2 Impact of inflation on the envisaged new own resources in the adjusted first basket

To finance NGEU borrowing costs, Parliament, Council and Commission adopted an Interinstitutional Agreement (IIA) on budgetary discipline, cooperation in budgetary matters and sound financial management on December 10, 2020, which inter alia, includes a roadmap for the introduction of new own resources during the 2021 – 2027 MFF period. According to the IIA, new own resources were to be introduced in two steps³⁰. In December 2021, the Commission put forward a proposal for a first basket

³⁰ See D'Alfonso (2021) and Dobrova (2023) for brief overviews and Schratzenstaller et al. (2022) for a detailed discussion of the initial proposals for the envisaged new own resources.

of new own resources including own resources based on auctioning revenues from the EU Emission Trading System (ETS), on revenues from an EU Carbon Border Adjustment Mechanism (CBAM), and on residual profits of the largest multinational enterprises allocated to the EU under the OECD/G20 Pillar 1 agreement. A second basket of new own resources based on the taxation of financial transactions and of corporations were to be proposed by the Commission by the end of 2023.

According to the Commission's updated proposal launched on June 20, 2023, which under the heading "An adjusted package for the next generation of own resources" (European Commission, 2023c) revises the original proposal for the first basket of new own resources, this first basket shall include three new own resources:

1. An own resource based on the current ETS shall be introduced in 2024. The ETS shall be extended by a second ETS2 as of 2027, with the related own resource to be implemented in 2028. The own resource payments by Member States shall be determined by applying a call rate of 30% (instead of 25% as originally proposed) to all revenues generated by emissions trading. The ETS-based own resource is expected to yield EUR 7 billion annually as of 2024 and EUR 19 billion annually as of 2028.
2. The Carbon Border Adjustment Mechanism (CBAM) will be implemented in 2026 (with a transitional phase starting in October 2023). The related own resource shall be implemented in 2028, generating revenues for the EU budget (applying a call rate of 75% on overall CBAM revenues) of EUR 1.5 billion per year.
3. As both the multilateral convention on the OECD/G20 agreement on the so-called "Pillar One" and the Business in Europe: Framework for Income Taxation (BEFIT) are still pending so far, a temporary statistical new own resource on company profits shall be levied until the introduction of a tax underlying the above-mentioned agreements and frameworks on which a permanent own resource shall be based. This new own resource shall be determined by applying a call rate of 0.5% on companies' gross operating surplus. It is expected to yield annual revenues for the EU of EUR 16 billion as of 2028.

Altogether, this adjusted first basket of new own resources is expected to yield EUR 23 billion annually (from the ETS-based own resource and the temporary statistical own resource based on company profits) as of 2024. This would amount to a total sum of EUR 92 billion over the years 2024 to 2027. As of 2028, the three new own resources proposed in the adjusted first basket shall generate yearly revenues up to EUR 36.5 billion.

Table 10: Proposed new own resources contained in the adjusted first basket

| Own resource | Brief description | Timeframe | Expected revenues in EUR billion p.a. (in 2018 prices) |
|---|---|--|--|
| ETS-based own resource | 30% of all revenues from emission trading in the EU including power plants, industry and aviation (ETS1), maritime transport, buildings, road transport (ETS2) | As of 2024 As of 2028 ¹⁾ | 7 ⁴⁾ 19 ⁴⁾ |
| CBAM-based own resource | 75% of revenues from CBAM applying a carbon price from imports from third countries not applying carbon pricing ²⁾ to cement, steel and iron, aluminium, fertiliser, electricity | As of 2028 ³⁾ | 1.5 ⁴⁾ |
| Temporary statistical own resource based on company profits | 0.5% of notional EU company profit base (gross operating surplus of financial and non-financial corporations) | As of 2024 | 16 |
| Total | | 2028 to 2030 | Up to 36.5 |

Source: European Commission (2023c, 2023d), own representation. – ¹⁾ Introduction of the new ETS2 planned for 2027. – ²⁾ Number of imported products subject to CBAM to be extended over time. – ³⁾ Start of the transitional phase in October 2023, entering into force of the definitive system in January 2026. – ⁴⁾ Based on a carbon price of EUR 80 per tonne.

Whether and to what extent high inflation in general and high energy prices in particular influence revenues from the envisaged new own resources can only be assessed qualitatively within this study.

Revenues from emission trading as well as from CBAM depend on the European carbon price. If inflation has an effect on the carbon price, and if yes, in which direction and to what extent, cannot be determined ex ante. Ampudia et al. (2022) point out that the considerable increase of the European carbon price since 2021 has been driven by a multitude of factors, some of them of a more short-term and transitory, others of a more long-term and structural nature. **Overall, a direct impact of inflation on the European carbon price does not seem to exist. Therefore, it can be assumed that neither the envisaged ETS-based nor CBAM-based new own resource directly depend on inflation.**

Regarding the impact of inflation on the gross operating surplus of the corporate sector, a short-term and a longer-term perspective need to be distinguished. In the (very) short run, inflation will depress the gross operating surplus provided that firms' price adjustment lags behind the inflation-induced increases of their costs. In the longer run, however, firms will adjust sales prices, so that the development of the gross operating surplus follows inflationary developments. **As the own resource payments based on the gross operating surplus of the corporate sector are determined by applying an ad valorem call rate, revenues will not be eroded by inflation. For an inflation rate above the 2% deflator currently applied for MFF expenditures the share of revenues from a new own resource based on the corporate sector in overall EU revenues can be expected to increase.**

Altogether, it is plausible to assume that neither the ETS- nor the CBAM-based new own resource are directly influenced by inflation, whereas the revenue from the own resource based on the corporate sector will follow inflation in the longer run. Therefore, the proposed three new own resources of the adjusted first basket should be rather resilient to inflationary developments.

3.2.3 Impact of inflation on other potential new own resources

The second basket of new own resources originally foreseen in the IIA shall comprise taxes on financial transactions as well as on the corporate sector. Moreover, further options have been put forward in the academic and policy debate recently (see, e.g., Schratzenstaller et al., 2022; European Parliament, 2023b).

Some of these new own resource options relate to bases that directly react to inflation. This concerns financial transactions whose nominal value can be expected to grow with inflation.

Thus, the share of revenues from an own resource based on financial transactions in overall revenues (which under the current system grow at 2% annually) will increase for an inflation rate above 2%.

Other options apply specific rates, i.e. call rates that are expressed as absolute amounts per unit of the underlying base, on specific bases. If these call rates are not inflation-adjusted, nominal revenues from the respective own resources will remain constant, whereas their shares in overall revenues will decrease. This concerns statistical own resources based, e.g., on biowaste and food waste³¹ as well as specific taxes on aviation or specific agri-ecological taxes.³² Regular inflation adjustment of the call rates can avoid the erosion of the real value of revenues from these new own resource options and enable rising shares in overall revenues in high inflation situations. Otherwise, potential steering effects intended by the implementation of such statistical new own resources will be eroded over time.

Further options for new own resources are not directly influenced by inflation, for example an EU “fair border mechanism” or statistical new own resource on the gender pay gap,³³ as well as taxes on transactions of or capital gains from cryptocurrencies.³⁴

Overall, those new own resource options whose base grows with inflation (in particular financial transactions) or whose call rates are expressed in absolute values that are automatically inflation adjusted will in a high inflation environment lead to the replacement of a part of revenues from the GNI-based own resource, given that overall EU revenues are allowed to grow at 2% annually only. In the case of own resource options that are associated with steering effects (e.g., curbing emissions from aviation or containing biowaste or food waste) this effect would contribute to the overall aim of strengthening the contribution of the own resource system to strategic policy goals of the EU.

3.2.4 Conclusions

Overall, inflationary developments result in a structural shift within EU revenues. Their overall volume is determined by MFF expenditures, whose nominal growth is limited to 2% annually independent of actual inflation. Therefore, revenues growing at a higher rate due to inflation will contribute in increasing shares to overall revenues. More precisely, this implies that the shares of the VAT-based own resource, custom duties based on ad valorem rates, and taxes on EU staff salaries can be expected to grow after 2021, while the share of the GNI-based own resource will shrink in a high inflation environment. The share of the plastic own resource will decrease in any case if the call rate is not adjusted based on the 2% deflator or the actual inflation rate. The revenues from the remaining elements of other revenue, which are independent of inflation, will not be influenced by higher inflation; but their shares will decrease.

³¹ See European Parliament (2023b) for a brief description of these options.

³² See Schratzenstaller et al. (2022) for a more detailed presentation of these options.

³³ See European Parliament (2023b) for a brief description.

³⁴ See Schratzenstaller et al. (2022) for a more detailed presentation.

It is predominantly the revenue from import duties and the VAT-based own resource and some (minor) elements of other revenue which are driven upward by higher inflation, while revenue stemming from the plastic own resource and from the remaining items falling under other revenue will not react to inflation. As neither import duties nor the position “other revenue” can be directly attributed to individual Member States, the potential shift in the distribution of the financial burden among Member States due to inflation primarily pertains to the VAT- and GNI-based own resources.

Although inflation will drive up Member States’ own resource bases, this will not provide room for covering higher expenses, as the total budget of the EU is expenditure driven. That means that higher revenues resulting from inflation will end up in a lower remaining amount to be covered by the GNI-based own resource. Consequently, Member States’ GNI-based own resource payments will decrease according to their national incomes.

The HICP inflation and GDP deflator changes on the distribution of own resource payments across Member States can be summarised as follows:

An increase of the HICP in the EU which is driven by price increases from imports of third countries will increase revenues from the traditional own resources (i.e., from import duties) and hence lower the amount of EU revenues to be covered by Member States’ contributions. This will mitigate somewhat the currently relatively larger contributions of richer Member States to financing the EU budget.

An increase of the HICP in the EU increases revenues from the VAT-based own resource and decreases the residual amount to be covered by the GNI-based own resource. Very generally, to the extent that due to inflation the financing of the EU becomes more dependent on VAT-based own resources, inflation has a regressive effect as it over-proportionately burdens lower income households as well as poorer Member States with higher consumption rates.³⁵

An increase of the HICP inflation rate in one Member State above the EU average increases the share of this Member States in overall VAT-based own resource payments and decreases it for all other Member States where HICP is below the EU average.

An above EU average increase of the GDP deflator in one Member State increases the share of this Member State in overall GNI-based own resource payments and decreases it for other Member States where GDP deflators are below the EU average.

This mechanism works also when considering the lump sum corrections of GNI-based own resource payments for several Member States. Whenever the GNI deflator of a Member State eligible for a rebate is above the EU average, the share of this Member State in GNI-based own resource payments increases, while the share of all other Member States where GDP deflators are below the EU average is reduced.

Regarding the impact of inflation on the adjusted first basket of new own resources it is plausible to assume that neither the ETS- nor the CBAM-based new own resource are directly influenced by inflation, whereas the revenue from the own resource based on the corporate sector will follow inflation in the longer run. Therefore, the proposed three new own resources of the adjusted first basket should be rather resilient to inflationary developments.

The second basket of new own resources originally foreseen in the IIA shall comprise taxes on financial transactions as well as on the corporate sector. Moreover, further options have been put forward in the academic and policy debate recently.

³⁵ Whereby this effect is cushioned off by the 50% cap for the VAT base referred to on page 35 on which VAT-based own resource payments are based.

Some of these new own resource options relate to bases that directly react to inflation. This concerns financial transactions whose nominal value can be expected to grow with inflation. Thus, the share of revenues from an own resource based on financial transactions in overall revenues (which under the current system grow at 2% annually) will increase for an inflation rate above 2%.

Other options apply specific rates, i.e., call rates that are expressed as absolute amounts per unit of the underlying base, on specific bases. If these call rates are not inflation-adjusted, nominal revenues from the respective own resources will remain constant, whereas their shares in overall revenues will decrease. This concerns statistical own resources based, e.g., on biowaste and food waste as well as specific taxes on aviation or specific agri-ecological taxes. Regular inflation adjustment of the call rates can avoid the erosion of the real value of revenues from these new own resource options and enable rising shares in overall revenues in high inflation situations. Otherwise, potential steering effects intended by the implementation of such statistical new own resources will be eroded over time.

Further options for new own resources are not directly influenced by inflation, for example an EU “fair border mechanism” or statistical new own resource on the gender pay gap, as well as taxes on transactions of or capital gains from cryptocurrencies.

Overall, those new own resource options whose base grows with inflation (in particular financial transactions) or whose call rates are expressed in absolute values that are automatically inflation adjusted will in a high inflation environment lead to the replacement of a part of revenues from the GNI-based own resource, given that overall EU revenues are allowed to grow at 2% annually only. In the case of own resource options that are associated with steering effects (e.g., curbing emissions from aviation or containing biowaste or food waste) this effect would contribute to the overall aim of strengthening the contribution of the own resource system to strategic policy goals of the EU.

4 CASE STUDIES ON THE IMPACTS OF INFLATION ON SPECIFIC EU BUDGET PROGRAMMES

4.1 Case study on the impact of inflation on the Bulgarian RRP

The programming and submission of most of the national Recovery and Resilience Plans (RRPs) were done in 2021, before the intensive bout of inflation began and continued throughout 2022. The investment projects in each national RRP have undergone a detailed costing exercise at the time of their submission, which includes a market assessment to evaluate the necessary costs for each project, as well as informal consultations with the European Commission Services.

The inflationary pressure on the budgets for funding the national RRP is a general problem that Member States are facing. Different timeframes for submission of the RRP mean that the initial price level for goods, construction work, wage payments and other costs included in national plans is different. In this study, we focus on the Bulgarian case, where the costing under the National RRP was made in late 2021 upon the initial submission of the Plan to the Commission services. Most of the investments underwent changes (also in terms of costing) at the beginning of 2022 prior to the official adoption of the RRP in April 2022. This is specific to different Member States, since their submission was done at various points in time and therefore includes a different inflation accumulated since then. 14 Member States submitted their NRRPs by the beginning of May 2021, another 7 Member States submitted them by the beginning of June 2021. The rest of the Member States submitted in the summer of 2021, with Bulgaria submitting on October 15, 2021, and the Netherlands submitting on July 8, 2022. As inflation only accelerated significantly at the end of 2021, the RRP of most Member States should be affected *ceteris paribus* relatively equally by the accumulated inflation since then.

In our case study we calculate the expected inflation to be accumulated for the Bulgarian RRP in its implementation period 2022 – 2026. The overall results in terms of inflation impact in other national RRP depend on the time of submission and costing of the RRP investment projects, as well as on the relative weight of investment projects in relation to their main activities. After calculating the accumulated inflation for each year for each project and the overall RRP inflation effect, we discuss policy options to address the issue. We briefly explore the questions of what methodology can be used for inflation indexation, as well as possible funding sources for the increased funding needs, based on in-depth interviews with national authorities. Finally, we discuss the response of the Bulgarian government so far in terms of amendments to the RRP.

4.1.1 Key facts and figures

This part of the study includes a case study on the Bulgarian RRP and an estimation of how the Bulgarian RRP and specific projects are affected by the inflation surge. The Bulgarian RRP was finalised in February 2022. Therefore, the market pricing and costing exercise, which is part of the process of preparation of national RRP, was done in the beginning of 2022 at the latest. The costs of each project have been evaluated at that point of time and these are the costs that has been embedded in the final version of the RRP which was initially approved by the European Commission in April 2022 and then finally signed in May 2022.

In this case study, we assess the inflation already accumulated and evaluate the expected evolution throughout the whole implementation phase of the RRP projects up until 2026. We pursue this on a project-by-project basis. The Bulgarian RRP includes 57 individual projects, which are split in 12 thematic chapters.

For the purpose of evaluation, project costs are split throughout the timeline of the RRP up until 2026 by taking into consideration their realisation so far, delays already encountered and expected delays for the start and implementation of the projects. Given this implementation timeline, a certain amount of the costs of the projects falls into each year up until 2026. For this share of the project costs, the accumulated inflation up until this period is calculated and used to estimate the cost increases.

Different inflation indices are used for different projects – these inflation indices are related to the main activities as well as goods and services that are expected to be required throughout the projects. For 2022 and 2023 either the broad HICP (all items), industrial goods prices data, construction producer price and cost indices or other inflation indicator listed below are used, as reported by the European Commission (2023f), the Bulgarian National Statistical Institute (BNSI), and the Bulgarian National Bank (2023) or Eurostat. For each project the most relevant inflation index in terms of the type of project is used (focused on construction, acquiring specific goods, energy, imports etc.). For some projects we use an average of two indices – e.g. a construction cost index and a producer price index, where the types of investments contain significant construction activities as well as the acquisition of equipment and other industrial goods. We select from the following inflation indicators:

- HICP All Items, End-of-period value –Annual Rate of Change, Bulgarian National Bank (2023), June 2023 Macroeconomic Forecast
- HICP All Items, Annual percentage change (average) – HICP, Annual Rate of Change; European Commission (2023) ECFIN AMECO
- Construction Cost Index – EU, Construction producer prices and costs 2005 - 2023, unadjusted data (2015 = 100), Eurostat; the Construction Producer Price Index (CPPI) is a European Union (EU) business cycle indicator that measures the prices of construction activities (new residential buildings) from the point of view of the building constructor. The Construction Cost Indicator (CCI) shows the development of costs for new residential buildings.
- HICP Non-Energy Industrial Goods – Annual Rate of Change, Eurostat;
- HICP Imports of Goods and Services – 2015=100 Price Index Based, Index, Eurostat
- Construction Price Deflator – Estimate, European Commission DG ECFIN AMECO;
- GDP Deflator at market prices – Estimate, European Commission DG ECFIN AMECO;
- For 2024 and 2025 the latest inflation projections for HICP (All items) from the Bulgarian National Bank (BNB) macroeconomic forecast are used, as well as forecasts from the European Commission (2023f), ECFIN AMECO data on GDP deflators and construction price deflators. The BNB HICP (all items) forecast for 2025 is 3% (June 2023 forecast, Bulgarian National Bank, 2023).
- For 2026 we assume inflation returns to 2%, in line with an inflation target of 2%.

Table 11 reports the values used for different inflation indices for 2022, 2023 and 2024.

Table 11: Inflation indices and values used in the calculation

| Inflation Index | 2022 | 2023 (Latest value or forecast) | 2024 (Forecast) |
|---|-------|--|-----------------|
| HICP All Items end-of-period Bulgarian National Bank, June 2023 | 14.3 | 5.6 (f) | 3.4 (f) |
| HICP All Items, Average annual rate of change, European Commission Spring 2023 forecast | 13.0 | 9.6 | |
| Eurostat Construction Cost Index | 62.5 | 18.5 (average value for Q1 and Q2 2023) | |
| HICP Non-Energy Industrial Goods | 10.2 | 9.6 (May 2023) | |
| HICP Imports of Goods and Services | 11.95 | 6.78 (Q1 2023) | |
| Construction Price Deflator | 18.9 | 4.3 (f) | 3.0 (f) |
| GDP Deflator | 15.1 | 10.4 (f) | 3.9 (f) |

Source: Bulgarian National Bank (2023), Bulgarian National Statistical Institute (NSI), Eurostat, European Commission (2023f) ECFIN AMECO; f – forecast, date – latest actual data.

4.1.2 Results

Based on this approach, our results suggest that the overall price of the projects in the Bulgarian National RRP can be expected to increase by an accumulated 30.9% throughout the years 2022 – 2026, which amounts to an average annual inflation of around 5.53%. This is much higher than the 2% annual inflation target embedded in the MFF and RRF automatic indexation component, which would amount over the five years to an accumulated inflation of overall 10.4%. **These inflationary developments thereby will either reduce the real value of the projects envisaged under the RPP and therefore the volume of deliverables, will make them infeasible to implement, or will necessitate some adjustments upwards to their funding.**

Table 12 below lists all projects and the accumulated inflation by the end of each year, as well as the accumulated inflation for the whole horizon of the project. Note, however, that in some of the years, e.g., 2022 or 2026, no project activities on some projects have been undertaken or are expected to take place, so in the calculation no part of the costs are realised in these years. The realisation of costs is distributed therefore by the current and expected realisation of individual projects and then multiplied by the accumulated inflation by that point in relation to the reference period for the final costing exercise at the beginning of 2022. The main part of the activities is expected to be realised for most of the projects in 2023 and 2024. Some projects with a high degree of project readiness have already realised a significant part of the investments such as the Sofia subway extension („Ensuring sustainable transport connectivity through the construction of Stage 3 of Line 3 of the metro in Sofia - "Hadzhi Dimitar" metro station - "Levski-G" residential area"). As we elaborate on below, these are also the projects for which we have actual inflation data to date, which can help validate our calculations.

Table 12 can be understood in the following way. The column “RRF financing in EUR” reports the initial sum planned for the respective project in the Bulgarian RRP, finalised and approved in 2022. For each year the table then reports the accumulated inflation from the beginning of 2022 until the end of the

respective year and taking into account an inflation index as reported in Table 11, which is most closely related to the main activities of the project (construction, acquisition of equipment, manufacturing goods, industrial goods, energy, or a broader mix of activities, etc.). The detailed table of results in Table 13, Appendix 2, shows the inflation index used for each project. Here we do not take into account that in “normal times” inflation would be 2% and we do not deduct this “normal” inflation from our preferred inflation index value.

We also take the different timelines of the various projects into account, so the realisation of project costs is distributed throughout the period 2022 – 2026 given the information we have about their realisation so far, possible delays and the initial timeline of each project. For each year then the costs after taking into account the accumulated inflation by the end of the given year can be calculated. The sum of these costs is then reported in Table 12 in the column “Project Costs Adjusted for Inflation in EUR”, which reports the total project costs for each investment. The sum of all these total project costs then gives us the total RRP costs for all projects, adjusted for inflation. The difference between “RRF financing in EUR” and “Project Costs Adjusted for Inflation in EUR” can then be understood as the funding shortfall over the whole implementation horizon if the assumed inflation rates up until 2026 are realised. The last column then reports the average inflation for each project throughout 2022–2026.

Table 12: Inflation impact evaluation on the Bulgarian RRP, project by project, 2022 – 2026

| Investment project | RRF financing in EUR | Accumulated Inflation 2022 | Accumulated Inflation 2023 | Accumulated Inflation 2024 | Accumulated Inflation 2025 | Accumulated Inflation 2026 | Project Costs Adjusted for Inflation in EUR | Average Inflation 2022-2026 |
|--|----------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|---|-----------------------------|
| Education and skills | | | | | | | | |
| STEM centres and innovation in education | 245,485 | 12.0% | 22.5% | 26.6% | 30.4% | 33.0% | 301,637 | 22.9% |
| Modernization of educational infrastructure | 291,139 | 17.0% | 28.0% | 32.3% | 36.3% | 39.0% | 373,872 | 28.4% |
| Digital skills training and an adult learning platform | 164,657 | 13.0% | 23.6% | 27.8% | 31.7% | 34.3% | 204,219 | 24.0% |
| Youth centres | 32,253 | 17.0% | 28.0% | 32.3% | 36.3% | 39.0% | 41,419 | 28.4% |
| Research and innovation | | | | | | | | |
| Innovation capacity of the Bulgarian Academy of Sciences in green and digital technologies | 23,902 | 13.0% | 24.8% | 29.6% | 33.5% | 36.2% | 29,440 | 23.2% |
| Program for economic recovery and transformation through science and innovation | 187,385 | 13.0% | 24.8% | 29.6% | 33.5% | 36.2% | 230,799 | 23.2% |
| Intelligent industry | | | | | | | | |
| Program to support industrial zones and parks and improve their infrastructural connectivity (AttractInvestBG) | 110,695 | 40.7% | 50.5% | 56.3% | 61.0% | 64.3% | 172,158 | 55.5% |
| Economic transformation program | 690,016 | 10.2% | 20.8% | 24.9% | 28.6% | 31.2% | 822,582 | 19.2% |

The impacts of recent inflation developments on the EU finances

| Investment project | RRF financing in EUR | Accumulated Inflation 2022 | Accumulated Inflation 2023 | Accumulated Inflation 2024 | Accumulated Inflation 2025 | Accumulated Inflation 2026 | Project Costs Adjusted for Inflation in EUR | Average Inflation 2022-2026 |
|--|----------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|---|-----------------------------|
| Low-carbon economy | | | | | | | | |
| Sustainable energy renovation of the residential building stock | 608,183 | 40.7% | 56.7% | 62.9% | 67.7% | 71.1% | 974,825 | 60.3% |
| Sustainable energy renovation of the non-residential building stock | 315,802 | 40.7% | 56.7% | 62.9% | 67.7% | 71.1% | 515,060 | 63.1% |
| Single-family and multi-family building renewable energy financing program | 71,579 | 37.2% | 54.6% | 60.6% | 65.4% | 68.7% | 109,891 | 53.5% |
| Energy-efficient municipal systems for outdoor artificial lighting | 76,324 | 18.9% | 24.0% | 28.8% | 32.7% | 35.4% | 94,609 | 24.0% |
| Digital transformation of the Energy System Operator | 189,178 | 36.4% | 55.5% | 61.6% | 66.4% | 69.7% | 285,608 | 51.0% |
| National infrastructure for storing electrical energy from RES (RESTORE) | 799,055 | 11.1% | 20.2% | 24.9% | 28.6% | 31.2% | 1,012,749 | 26.7% |
| Scheme to support green hydrogen and biogas pilot projects | 35,000 | 11.1% | 20.2% | 24.9% | 28.6% | 31.2% | 43,737 | 25.0% |
| Support for the construction of a minimum of 1.4GW of RES and batteries | 342,000 | 15.4% | 21.8% | 26.6% | 30.4% | 33.0% | 439,971 | 28.6% |
| Combined production of heat and electricity from geothermal sources | 175,400 | 15.4% | 21.8% | 26.6% | 30.4% | 33.0% | 223,023 | 27.2% |

| Investment project | RRF financing in EUR | Accumulated Inflation 2022 | Accumulated Inflation 2023 | Accumulated Inflation 2024 | Accumulated Inflation 2025 | Accumulated Inflation 2026 | Project Costs Adjusted for Inflation in EUR | Average Inflation 2022-2026 |
|--|----------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|---|-----------------------------|
| Biodiversity | | | | | | | | |
| Ecosystem approach and nature-based solutions in protection of Natura 2000 areas | 15,583 | 13.0% | 23.6% | 27.8% | 31.7% | 34.3% | 19,380 | 24.4% |
| Restoration of key climate ecosystems | 31,945 | 13.0% | 23.6% | 27.8% | 31.7% | 34.3% | 39,729 | 24.4% |
| Sustainable agriculture | | | | | | | | |
| Fund for Promotion of Technological and Ecological Transition of Agriculture | 223,630 | 11.1% | 20.2% | 24.3% | 28.0% | 30.6% | 270,929 | 21.2% |
| Digitalization of the processes from farm to fork | 10,200 | 11.1% | 20.2% | 24.3% | 28.0% | 30.6% | 12,357 | 21.2% |
| Digital connectivity | | | | | | | | |
| Large-scale deployment of digital infrastructure on the territory of Bulgaria | 269,589 | 14.6% | 22.5% | 27.3% | 31.1% | 33.7% | 334,484 | 24.1% |
| Building, development and optimization of digital TETRA system and radio relay network | 63,656 | 12.0% | 19.5% | 24.2% | 27.9% | 30.5% | 75,238 | 18.2% |
| Digital transformation of Bulgarian Posts and provision of complex services | 51,980 | 10.2% | 20.8% | 25.5% | 29.3% | 31.8% | 66,208 | 27.4% |

The impacts of recent inflation developments on the EU finances

| Investment project | RRF financing in EUR | Accumulated Inflation 2022 | Accumulated Inflation 2023 | Accumulated Inflation 2024 | Accumulated Inflation 2025 | Accumulated Inflation 2026 | Project Costs Adjusted for Inflation in EUR | Average Inflation 2022-2026 |
|--|----------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|---|-----------------------------|
| Transport | | | | | | | | |
| Intermodal terminal in the North Central Planning Region in Bulgaria - Ruse | 22,577 | 18.9% | 24.0% | 28.8% | 32.7% | 35.4% | 28,937 | 28.2% |
| Reform of rail passenger services by purchasing new rolling stock | 340,469 | 12.0% | 19.5% | 24.2% | 27.9% | 30.5% | 418,062 | 22.8% |
| Implementation of the European Train Management System (ERTMS) for on-board equipment | 32,211 | 12.0% | 19.5% | 24.2% | 27.9% | 30.5% | 39,552 | 22.8% |
| Construction of Stage 3 of Line 3 of the metro in Sofia - metro station "Hadzhi Dimitar" - "Levski-G | 111,188 | 13.0% | 23.6% | 27.8% | 31.7% | 34.3% | 135,312 | 21.7% |
| Digitization of the TEN-T network through the implementation of ERTMS in the railway section Ruse - Kaspichan | 105,255 | 18.9% | 23.7% | 28.5% | 32.3% | 35.0% | 134,423 | 27.7% |
| Improvement of road safety by enabling sustainable road safety management | 5,113 | 13.0% | 23.6% | 27.8% | 31.7% | 34.3% | 6,359 | 24.4% |
| "Green Mobility" - a pilot scheme to develop ecological, safe, functional and energy-efficient transport systems | 49,574 | 13.0% | 20.7% | 24.8% | 28.5% | 31.1% | 61,797 | 24.7% |
| Local development | | | | | | | | |
| Program for construction/reconstruction/reconstruction of water supply and sewage systems | 153,388 | 18.9% | 23.7% | 27.4% | 31.2% | 33.8% | 192,231 | 25.3% |
| Digitalization for complex management, control and efficient use of water | 57,557 | 12.0% | 19.5% | 24.2% | 27.9% | 30.5% | 72,029 | 25.1% |

| Investment project | RRF financing in EUR | Accumulated Inflation 2022 | Accumulated Inflation 2023 | Accumulated Inflation 2024 | Accumulated Inflation 2025 | Accumulated Inflation 2026 | Project Costs Adjusted for Inflation in EUR | Average Inflation 2022-2026 |
|---|----------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|---|-----------------------------|
| Business environment | | | | | | | | |
| Improving the quality and sustainability of security services | 41,009 | 13.0% | 23.6% | 27.8% | 31.7% | 34.3% | 51,002 | 24.4% |
| Upgrade the Unified Information System of Courts of Justice | 9,875 | 12.0% | 19.5% | 24.2% | 27.9% | 30.5% | 12,436 | 25.9% |
| Digitalisation in the system of administration of justice | 3,642 | 12.0% | 19.5% | 24.2% | 27.9% | 30.5% | 4,587 | 25.9% |
| Information and communication infrastructure in the Prosecutor's Office of the Republic of Bulgaria | 14,714 | 12.0% | 19.5% | 24.2% | 27.9% | 30.5% | 18,530 | 25.9% |
| Digitalizing information arrays in register data and e-certification from registers | 63,247 | 12.0% | 19.5% | 24.2% | 27.9% | 30.5% | 77,258 | 22.2% |
| Methods for alternative resolution of disputes in the judicial system in Bulgaria - pilot introduction of mandatory court mediation | 826 | 13.0% | 23.6% | 27.8% | 31.7% | 34.3% | 1,028 | 24.4% |
| Pilot phase for introduction of construction information modelling (CIM/BIM) in construction sector | 3,983 | 12.0% | 19.5% | 23.6% | 27.3% | 29.9% | 4,811 | 20.8% |
| Unified information system for spatial planning, investment design and construction permitting | 1,497 | 12.0% | 19.5% | 23.6% | 27.3% | 29.9% | 1,808 | 20.8% |
| Instrument for a better strategic planning and strategic management | 733 | 12.0% | 19.5% | 23.6% | 27.3% | 29.9% | 886 | 20.8% |
| Information and administrative environment for the implementation of the RRP | 6,438 | 12.0% | 19.5% | 23.6% | 27.3% | 29.9% | 7,793 | 21.1% |
| Upgrading of the Center for Aerospace Observation | 56,559 | 14.6% | 22.5% | 27.3% | 31.1% | 33.7% | 72,316 | 27.9% |

| Investment project | RRF financing in EUR | Accumulated Inflation 2022 | Accumulated Inflation 2023 | Accumulated Inflation 2024 | Accumulated Inflation 2025 | Accumulated Inflation 2026 | Project Costs Adjusted for Inflation in EUR | Average Inflation 2022-2026 |
|---|----------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|---|-----------------------------|
| Social inclusion | | | | | | | | |
| Modernising long-term care | 328,877 | 15.1% | 25.9% | 30.2% | 34.1% | 36.8% | 426,545 | 29.7% |
| Assisting devices to persons with permanent disabilities | 10,226 | 12.0% | 19.5% | 23.6% | 27.3% | 29.9% | 12,276 | 20.0% |
| Modernisation of the Employment Agency | 13,612 | 18.9% | 23.7% | 27.9% | 31.7% | 34.3% | 17,202 | 26.4% |
| Development of the social economy | 12,320 | 15.1% | 25.9% | 30.2% | 34.1% | 36.8% | 15,606 | 26.7% |
| Development of the cultural and creative sectors | 40,746 | 13.0% | 23.6% | 27.8% | 31.7% | 34.3% | 51,279 | 25.8% |
| Digitalisation of museum collections, libraries and archives | 30,438 | 12.0% | 19.5% | 23.6% | 27.3% | 29.9% | 37,527 | 23.3% |
| Modernisation of the Agency for Social Assistance | 4,170 | 15.1% | 25.9% | 30.2% | 34.1% | 36.8% | 5,283 | 26.7% |
| Healthcare | | | | | | | | |
| Modernisation of medical facilities for hospital care | 178,506 | 12.0% | 19.5% | 23.6% | 27.3% | 29.9% | 215,628 | 20.8% |
| Centres for interventional diagnostics and endovascular treatment of cerebrovascular diseases | 54,767 | 12.0% | 19.5% | 23.6% | 27.3% | 29.9% | 66,156 | 20.8% |
| Modernisation of psychiatric care in Bulgaria | 12,152 | 12.0% | 19.5% | 23.6% | 27.3% | 29.9% | 14,680 | 20.8% |

| Investment project | RRF financing in EUR | Accumulated Inflation 2022 | Accumulated Inflation 2023 | Accumulated Inflation 2024 | Accumulated Inflation 2025 | Accumulated Inflation 2026 | Project Costs Adjusted for Inflation in EUR | Average Inflation 2022-2026 |
|--|----------------------|----------------------------|----------------------------|----------------------------|----------------------------|----------------------------|---|-----------------------------|
| Healthcare | | | | | | | | |
| Construction of a system for providing emergency medical assistance by air | 50,780 | 12.0% | 19.5% | 23.6% | 27.3% | 29.9% | 61,341 | 20.8% |
| National digital platform for medical diagnostics | 12,050 | 12.0% | 19.5% | 23.6% | 27.3% | 29.9% | 14,865 | 23.4% |
| Improve the national emergency communications system 112 | 23,854 | 12.0% | 19.5% | 23.6% | 27.3% | 29.9% | 29,427 | 23.4% |
| Development of outpatient care | 35,857 | 15.1% | 25.9% | 30.2% | 34.1% | 36.8% | 45,423 | 26.7% |
| TOTAL (CALCULATED) | 6,912,847 | | | | | | 9,048,319 | 30.9% |

Source: Own compilation and calculations. – Financing and project costs in EUR are calculated with LEV-EUR Exchange rate at the fixed value as per the Bulgarian currency board of 1 EUR = 1.95583 Lev.

Looking at the results, it is worth noting that there are significant differences in the inflation developments throughout different projects and components of the RRP. The biggest increases in single projects can be expected in the projects 'Support for sustainable energy renovation of the residential building stock', 'Support for sustainable energy renovation of the non-residential building stock' and 'Single-family and multi-family building renewable energy financing program'. For these projects, the accumulated inflation by the end of the implementation period is estimated to be overall above 60%. These are projects which are focused heavily on construction and reconstruction activities as well as on imported goods, which are both inflation indices that have seen the biggest price increases in 2022 and in the first half of 2023, and these have not been reversed so far. The assumption is they will not be reversed also going forward and the price level of construction costs will not correct itself to pre-2022 levels. While these are considerable cost increases and this is a conservative assumption, the assumption that inflation will fall back to 3% by 2025 and to 2% by 2026 can be seen as relatively optimistic. While inflation is not expected to continue at such high levels for the years after 2023, the significant increase in the price level in 2022, combined with more moderate inflation levels for 2024 and 2025, add up to significantly higher final cost outcome for these projects. Furthermore, these are also some of the biggest projects in the Bulgarian RRP – the two programmes for energy renovation of the non-residential and residential building stocks alone make around 18.9% of the overall Bulgarian RRP. From the separate 12 chapters of the Bulgarian RPP, the biggest price increases are accumulated in the chapters 'Low-carbon economy' and 'Intelligent industry'. In the latter, the project 'Support program for the development of industrial zones and parks and improvement of their infrastructure connectivity in order to attract investments (AttractInvestBG)' is expected to be affected by a price increase of around 55% due to it being also strongly affected by inflation developments in the construction and imported goods sectors.

The inflation effect is expected to be less pronounced in areas of intervention which include the acquisition of software, the IT systems or higher wage and administrative costs components. Projects related to digitalisation, which require the acquisition of different IT systems, for example accumulate inflation around 20% to 24% over the planning horizon up until 2026. For comparison, if inflation had been at the stable 2% target throughout the planning horizon, the overall accumulated inflation between 2021 and 2026 would have been 10.4%. On the one hand, this means that even projects which are less sensitive to the immense increases in construction costs, might face inflation twice as high as originally expected. On the other hand, however, the overall cost increases are predominantly driven by increases in the construction sector, with a lower contribution from the increase in the prices of industrial goods, and to a much lesser extent from other projects, that focus on the acquisitions of software, digitalisation of administration or have a large wage component (which is also indexed with the broad HICP).

4.1.3 Policy options and policy reactions to high inflation

In this section, we discuss the policy options for addressing the problem of increased project costs for the Bulgarian RRP in theory and practice. We first discuss the methodology for inflation indexation enacted by the Bulgarian government for public procurement contracts under the MFF 2014 – 2020. While this can serve as a basis for a general methodology for price indexation, it has the downside of being too general and centralised. We then discuss the findings of in-depth interviews with representatives of the national authorities, and we list the policy options for inflation indexation that can be implemented for the RRP. Finally, we discuss the recent steps taken by the Bulgarian government to revisit and amend the Bulgarian RRP, which partly address the issue of inflation indexation and compare it with the policy options listed before.

As the problem of increased inflation was already apparent in 2022 and in order to address the effect of inflation on the prices of basic goods and materials forming the value of contracts and framework agreements under the MFF 2014 – 2020 programmes, the Bulgarian government adopted a Decree No. 290 of the Council of Ministers on September 27, 2022 approving a methodology for price amendment of a public procurement contract as a result of inflation. The methodology can be applied to contracts concluded under the Public Procurement Act and was initially used for projects under the MFF 2014 – 2020. To amend the price indices of a producer on the domestic or international market of construction materials are applied. These indices are published every three months by the Bulgarian National Statistical Institute as "Index of producer prices on the internal market of construction materials" or by Eurostat. The calculations under the methodology refer to contracts already signed and offers made prior to 2021, but this application can be further considered to the RRF in terms of the costing of projects. The methodology stipulates that the amount of the change in the price of a public procurement contract and framework agreement as a result of inflation shall be determined according to the following formula:

$$Kn = \left[\frac{In - Io}{Io} \right] * 100$$

where Kn is the value, rounded to two decimal places and expressed as a percentage, which is applied as indexation to the value of these specific works that are subject to variation in prices and have been part of the formation of the value of the contract and framework agreement. In is the index value for the quarter in which the contract works are accepted or the quarter for which the framework agreement is indexed; Io is the value of the index on December 31, 2020 for tenders submitted before 31 December 31, 2020 or the date of the relevant quarter. In the case of subsequent indexation, Io shall be the value of the index at the time of the last amendment applied. A weighting factor is then applied for the type of construction concerned according to a table on the weighting of construction materials in the cost of different types of construction, published by Bulgarian authorities. Following this methodology, amendments to existing contracts can be implemented. While this would be the simplest approach to organise an effective and centralised process of inflation indexation of existing projects, especially related to construction works, it suffers from its nature. While some contractors agreed to index their contracts by the given indexation indices, others entered into negotiations, as they found this indexation insufficient, and threatened to forfeit the given contracts. This has led to delays in some projects where contractors did not agree with the given methodology.

4.1.4 Results of in-depth interviews with Bulgarian authorities

To evaluate the importance of these issues and how they relate to the overall performance and significance of European funding for the Bulgarian economy, we conducted detailed in-depth interviews with members of the Bulgarian civil service and administration, which are responsible for MFF and RRF funding. According to one of the respondents: *„MFF funding, especially in terms of Cohesion policy is of a great importance for the country. In many periods since the Bulgarian EU membership it was the main source and engine for the public investments – e.g. in the period 2013 – 2015 EU funds count for 70%-80% of the public investments. Going to the recent years of multiple crisis, structural funds provided the main support for overcoming the consequences of COVID-19 pandemic and for provision of shelter for the refugees from the war in Ukraine.“*

The experts pointed out that the changing inflation environment has had a negative impact on the implementation of programs, and especially on infrastructure projects. In some cases, this led to the refusal of contractors under public procurement contracts to continue the implementation of construction activities. Moreover, several beneficiaries were unable to complete their projects with the

available budgets and within the original deadlines. Regarding the RRF, the increased inflation created problems for investments whose implementation began in 2022. There was a delay in the implementation of one infrastructure project, including problems with final contractors. In terms of the changing inflation environment, at the beginning of the planning period in 2021 the expectations for inflation rates in the coming years were rather modest. Respective national authorities started activities on Cohesion funding adjustment to the growing inflation in the spring 2022 (April) and throughout 2022 there was also a request for submission of proposals for amendments to the RRP pursuant to Article 21 of the RRF Regulation, which also can include budgetary adjustments. Back in the beginning of the planning period, there were no contingencies for such an increase in inflation over the planning horizon.

First steps were already taken throughout 2022 and the first half of 2023 to address the inflation challenge in terms of Cohesion Funding in the Operational Programmes. *„The institutional steps and measures resulted in the adoption of the National Methodology for amendments of price of a public procurement contract because of inflation. It provides an opportunity to index the price of construction contracts, according to which the construction activities were carried out during the period of inflation and were accepted after 30.06.2021.*

Following the adoption of the Methodology, managing authorities prepared the necessary instructions to their beneficiaries on the application of the Methodology and specified the requirements that must be met for lawful indexation of contract prices and for equal treatment of all beneficiaries and contractors. This provided for relatively prompt conclusion of the respective annexes to the contracts.“

Notably and as expected, it was argued that the RRF has less flexibility for adjusting to the inflation problem as each national RRP comes with fixed commitments on certain objectives in the form of milestones and targets to be achieved throughout the lifetime of the RRP. *„The specificity of the RRP is that the projects are pre-defined with regard to their activities and budget. The respective budgets were determined based on costing which was approved by the European Commission. Therefore, there is less flexibility when it comes to adjust the budgets of investments to rising costs.“* This problem is the most pronounced for large infrastructure projects, where inflation has been the highest and the overall object is the finalisation of a specific large scale project.

To address this issue, there were *„discussions between the authorities and contractors on the indexation rate and the proper balance and some solutions were found in these discussions.“* Certainly however, *“the resources are not inexhaustible and can therefore not cover all requested indexation costs.“* **Since there is no expectation of any increase in the RRF funding for Bulgaria,³⁶ this would then most probably lead to a downward revision of some milestones and targets, as we discuss in the policy options below.**

In terms of methodological approaches to address the inflation problem, there was no focused contact with other Member States to explore their approaches, but the European Commission acted proactively by providing advice, disseminating experiences and best practices of other Member States. In the view of experts, the preferable approach to address the inflation problem would be to have a centralised methodology which provides certain room for flexibility for the managing authorities to adjust to the specifics of the respective programme and/or instrument. Finally, this problem has not occurred in Bulgaria in previous programming periods. The automatic adjustment of up to 2% has served its purpose in previous programming periods and was suitable to address years where inflation

³⁶ On the contrary, Bulgaria was subject to ex-post downward revisions of the overall grants. It is set to receive as part of the RRF EUR 579.8 million less than initially planned. The overall sum was revised in 2022 due to the better than expected economic developments throughout 2020 and 2021.

was positive, but below 2%, which was the case for most years of both programming periods 2007-2013 and 2014-2020. „Obviously, today the picture is very different with 6.4% inflation on EU average and 7.5% for Bulgaria in June 2023. Nevertheless, the expectations are for a gradual decrease of these trends.“

4.1.5 Policy options

To address the challenge of already accumulated and expected inflation, governments need to answer two questions. The first revolves around the question of the correct methodology to index increased costs, the second around the question where to find the additional resources or how to otherwise amend existing projects.

To evaluate the inflation effects, national governments can apply different methodologies – for the whole economy, sector-wide or based on types of activities (construction works, maintenance, transport). Indexation can be made through a horizontal national methodology taking into account uniform or sector-specific cost factors or through the requests of separate entities and institutions for specific projects and their evaluation of accumulated inflation. The above assessments for the case of the Bulgarian RRP show the results of such an approach with an all-encompassing indexation. It is important to point out, however, that such an approach delivers a rough approximation and an upper bound range of the inflation effect as given by the broad inflation indices. Each project is however affected by inflationary pressures to a different extent, which we tried to reflect by using different price indices for individual projects in relation to the main activities involved with the project.

Instead of a centralised methodology using statistical indices, a more detailed and precise approach is the direct negotiation between contracting institutions and contractors. This is feasible for projects where the implementation has not started yet and becomes inevitable for projects which are already ongoing with a selected contractor. Contractors and responsible ministries or national authorities have the best information to evaluate how inflation has affected different projects. In this evaluation, the two sides however have conflicting incentives. While national authorities have the incentive of cost minimisation to spare national and EU budgets, the project beneficiaries have the incentive to inflate their cost adjustment to prepare themselves for the case of further inflationary shocks. Bilateral negotiations can therefore lead to a successful price-finding process but are time-consuming and can cause significant delays in project realisation. In the case of Bulgaria for example, an indexation for one of the big energy investments, the project on ‘Digital transformation of the electricity transmission network’ by the Electricity System Operator, was proposed by the beneficiary. The request was for the RRF co-financing of the project to be revised up from BGN 549 million from the original value of BGN 370 million. Since the project envisages more than 45% of the funding for construction works, this share of the project was eligible for indexation under the National Methodology for Indexation, discussed in Section 4.1.3, yet so far this methodology is in effect only for cohesion funding projects that started before 2021. This request has so far not been accepted.

Beyond the question of finding the right approach to estimate the extra costs induced through inflation, a more crucial question is how to find sources for additional funding to address the funding shortfall. There are three policy options, each of them with specific trade-offs:

1. **Funding for indexation through additional national financing from the state budget.** This option has the benefit of higher national ownership of the RRFs and therefore stronger commitment from national governments for its effective implementation. More national financing from the state budget will also increase the recognition of the RRF in Member States. **If increased public investment for this additional national financing constitutes a risk to meeting Maastricht deficit criteria rules, it is worth discussing whether throughout the Economic Governance Framework review the Investment Clause to the Stability and**

Growth Pact could be amended also to include exceptions in the fiscal framework for the top-up funding for the national co-financing of the RRP.

2. **Funding for indexation through the additional resources from RePowerEU.** Through the new mechanism RePowerEU, Member States will receive additional funding for their National RRP. Member States can use the possibility to renegotiate their existing RRP as well as to propose how to use this additional funding. The aim of RePowerEU, however, is to finance additional new investments to help EU overcome its dependence on foreign energy supplies and the new RePowerEU chapters are subject to certain rules, which do not allow backtracking on the ambition of the existing plans. It is therefore questionable whether the additional funding can be used for indexation purposes.
3. **Finally, there have already been significant delays in the implementation of projects for the RRP. This means that Member States can and should adjust their national RRP accordingly and justify if some projects have become unrealistic timewise or financially for Member States.** This has the important implication that Member States can decide to drop investment projects throughout the renegotiation of their plans. This could however decrease the ambitions of national RRP for achieving the green and digital transition. In this context, the trade-off lies in balancing the need to scale back on some of the stated ambitions and planned investments while also ensuring a higher absorption rate for the RRF. This involves dropping projects that have become unrealistic, freeing up funds to support projects that are financially feasible based on a revised costing.

At the end of September 2023, the Bulgarian government submitted a request for an amendment to its national Recovery and Resilience Plan. This request for a revision of the existing RRP was based solely on Article 18 (2) of the RRF Regulation, which stipulates that Member States that face a downward revision of their RRF funding, can submit such a request for revision to address the reduction in funding. The reduction in funding spurs from the overall better than expected cumulative performance of the Bulgarian economy throughout the period 2020-2021. As this period serves as the key for the allocation of EU funding, the initial funding for Bulgaria was reduced in 2022, when final GDP figures for 2021 have been reported. In the case of Bulgaria this resulted in a reduction of the RRF non-repayable grant allocation of BGN 1,134 million, which amounts to EUR 579.8 million. According to the official Decision by the Council of Ministers: *“For the preparation of the amendment of the Plan, the Ministry of Finance has requested all the responsible ministries to make proposals for changes. In reviewing the proposals for amending the investments in relation to Article 18(2) of Regulation (EU) 2021/241, further internal analysis was carried out, taking into account the following criteria: significant delay in the start of implementation; risk of completing the investment or individual activities within the period of eligibility of expenditure under the RRP (until August 2026); lack of sufficient financial resources due to the sharp increase in inflation and prices in the construction sector while at the same time there is a serious reduction in the grant funding; the occurrence of insurmountable implementation difficulties that were not known when it was planned.”*

The amendment request therefore contains the request for changes to the Bulgarian RRP which relate to either

- projects becoming not feasible to be implemented in the given timeframe, or
- projects which are scaled down due to the reduced grant allocation, or
- changes relating to the new inflationary environment.

Overall, 17 changes to existing projects are included in the submitted revision request. Some relate to transfers of funds from one investment project to another, while other amendments relate to the reduction of parts of investment projects due to delays that have already occurred or due to some parts of the projects seen as infeasible to be realised.

There are however proposals for adjusting some investment projects directly as a consequence of increased inflation, which can serve as an orientation of inflationary pressures on specific projects already evaluated by the Bulgarian authorities. For example, an increase of around BGN 22.52 million (EUR 11.5 million) is proposed for the Sofia Metro Line 3 extension project, one of the flagship projects of the Bulgarian RRP and one of the projects with the best performance in terms of construction works so far. The increased costs claimed have been submitted by the contractor of the project activities for a price indexation of the public works contract for the second, third and fourth quarters of 2022 and the first quarter of 2023. After verification and assessment of the claims submitted, the value of this cumulative indexation has been verified and accepted by the contracting authority. This amounts to an indexation of 10.4% of the overall size of the project as initially planned in the RRP for construction works that have already occurred in 2022 and the first quarter of 2023. Our assumption in the estimates above in Table 12 is for incurred accumulated inflation for this project of 14.55% for 2022 and the first quarter of 2023, which is close to the negotiated amount between the contracting authority and the contractor.

Smaller projects with a focus on digitalisation have also been proposed for indexation. The project on a 'Unified Information System of Courts of Justice' has been revised up from BGN 23.86 million to BGN 29.91 million (EUR 12.20 million to EUR 15.29 million). The reasoning for that has been a claimed considerable increase in the costs of acquiring computer hardware and laptops. This amounts to an indexation of 25.4% for the whole project due to the increased costs of acquisition of technological equipment. The result of our evaluation exercise above is for overall costs for this project to be 25.9% higher than initially planned, meaning that the indexation exercise using inflation indices in some cases delivers results which are very close to those negotiated between the contracting authority and the contractor in the negotiation process.

The submitted RRP amendment request confirms our view stated above that Member States will have to make a choice between three options when addressing the inflationary challenge. They can either increase the funding using national, as well as additional EU funding, they can drop specific projects, which have become unrealistic in the timeline of the RRP, or they can reduce the quantitative commitments taken in terms of milestones and targets. Inevitably, Member States will have to make difficult choices balancing these three options, while still achieving the overall goals of the RRP to contribute to green and digital transition and enhance the resilience and competitiveness of their economies.

Conclusions

In this case study, we assess the effect of inflation already accumulated as well as evaluate the expected evolution throughout the whole implementation phase of the Bulgarian RRP up until 2026. We pursue this on a project-by-project basis by taking into account the expected implementation timeline of each project. For the share of each project which falls in a given year, the accumulated inflation up until this period is calculated and used to estimate the cost increases. Different inflation indices are used for different projects, reflecting the fact that different projects are focused on different activities and sectors – construction, the energy sector, acquisition of equipment, software, hardware, other manufacturing, and these sectors and activities have been affected heterogeneously by inflation.

Based on this approach, our results suggest that the overall price of the projects in the Bulgarian National RRP can be expected to increase by an accumulated 30.9% throughout the years, which amounts to an average annual inflation between 2022 and 2026 of around 5.53%. This is much higher than the 2% annual inflation target embedded in the MFF and RRF automatic indexation component, which would amount over the five years to an accumulated inflation of overall 10.4%.

These inflationary developments thereby will either reduce the real value of the projects envisaged under the RPP and therefore the volume of deliverables, will make them infeasible to implement, or will necessitate some adjustments upwards to their funding. The biggest contribution to these increased costs comes from projects with a high share of activities related to construction and these projects also have a considerable share of the overall RRP in comparison to projects less affected by inflation.

It is however important to point out that such an approach gives a rough approximation and an upper bound range of the inflation effect as given by the broad inflation indices. Each project is affected to a different extent by inflationary pressures, which we tried to reflect by using different inflation indices for individual projects in relation to the main activities involved with the project. A more detailed and precise approach instead of a centralised methodology using statistical indices is direct negotiation between contracting institutions and contractors.

At the end of September 2023, the Bulgarian government submitted a revision of the initial RRP with changes to individual projects as well as the removal of some projects from the plan, as discussed above due to the decreased grant allocation for Bulgaria and due to some projects not being feasible in terms of time and funding. The submitted RRP amendment request confirms our view stated above that Member States will have to make a choice between three options when addressing the inflationary challenge. They can either increase the funding using national, as well as additional EU funding, they can drop specific projects, which have become unrealistic in the timeline of the RRP, or they can reduce the quantitative commitments taken in terms of milestones and targets. Inevitably, Member States will have to make difficult choices balancing these three options, while still achieving the overall goals of the RRP to contribute to green and digital transition and enhance the resilience and competitiveness of their economies.

4.2 Case study on the effects of inflation on a specific Partnership Agreement and related Operational Programme in Spain

This case study analyses the effects of inflation on the Multiregional Operational Programme of Spain funded from the European Regional Development Fund (ERDF) 2014-2020. **This OP was selected since it is Spain's largest ERDF-funded programme within the MFF 2014-2020 with a significant portion of its fund being allocated to Research and Innovation (R&I). The primary objective of this study is to illustrate how inflation affects the ongoing Multiannual Financial Framework (MFF), with a specific focus on its implications for the final beneficiaries of EU funding. Furthermore, the case study sheds light on how inflation has influenced Research and Innovation (R&I) initiatives**, which received the largest share of funds within this Operational Programme (hereafter the OP or Multiregional OP). For this purpose, it delves into how inflation has affected the Multiregional OP and analyses the feasibility of meeting the expected objectives in the altered economic conditions of 2022/2023 as compared with the situation at programmatic stage in 2013/2014.

The case study begins with a brief introduction to the Multiregional OP 2014-2020. It then provides an overview of the outputs anticipated at the design stage and the outputs achieved in 2022, based on the ERDF 2014-2020 common and specific indicators. The case study then delves into a more detailed analysis of how inflation has impacted the Multiregional OP in a broader sense, exploring its effects on various aspects and priority areas of the OP. Special attention is given to the impact of inflation implemented on projects related to R&I. The case study ends by describing key measures and mitigation actions implemented at both European and national level and which contributed to addressing the challenges posed by inflation and cost increases.

From the methodological point of view, the case study relied on a combination of desk research, literature review and key informant interviews as the primary methods for data collection. A face-to-face interview was conducted with two representatives of Spain's Managing Authority for the ERDF, i.e., the Ministry of Finance and Public Administration (Ministerio de Hacienda y Función Pública). To provide a more comprehensive understanding of the impact of inflation on the final beneficiaries of the funds allocated through the Multiregional OP and its specific projects, an extensive review of publicly available media articles and public records was conducted.

Assessing the effects of the recent inflation surge on the Multiregional OP 2014-2020 was a complex task affected by several challenges. Firstly, a significant number of projects financed under this OP had been already concluded before the inflation began to significantly increase, and thus had an impact on its implementation (see 'key facts and figures' for more details). Secondly, the OP encompasses a vast number of projects, each potentially influenced by inflation to varying degree. As a consequence, providing an exhaustive quantitative analysis of inflation effects on both the projects and the OP, akin to the aforementioned case study, was not feasible.

4.2.1 Key facts and figures

The Multiregional OP is Spain's largest ERDF-funded programme within the MFF 2014-2020 with the EU contribution of EUR 11.94 billion. The OP has seven thematic objectives, namely: 01 - Strengthening research, technological development and innovation; 02 - Enhancing access to, and use and quality of information and communication technologies; 03 - Enhancing the competitiveness of small and medium-sized enterprises; 04 - Supporting the shift towards a low-carbon economy; 06 - Preserving and protecting the environment and promoting resource efficiency; 07 - Promoting sustainable transport and removing bottlenecks in key network infrastructures; 09 - Promoting social inclusion, combating poverty and any discrimination. that are listed below. Each thematic objective has several investment priorities. They can be consulted in Annex 3.

Based on the data from the Spanish Secretariat General for European Funds (operating under the Ministry of Finance and Public Administration), a total of 64,712 projects have been funded under this OP distributed among more than 30 thousand different beneficiaries. Beneficiaries with the largest number of projects funded under this OP include the Spanish National Research Council (CSIC)³⁷ and The Spanish Institute for Foreign Trade³⁸ with 1,487 and 1,428 projects respectively.

Examining the project implementation timeline, the vast majority of projects (61,172 or 99%) started before 2022, while a significantly smaller number of projects (540 or 1%) began in 2022 or later. A significant portion of projects (53,823 or 83%) were concluded between 2014 and 2021, predating the notable surge in inflation and price increases. However, it is important to highlight that 17% of projects (10,889) either concluded in 2022 or are expected to conclude thereafter. Consequently, a considerable

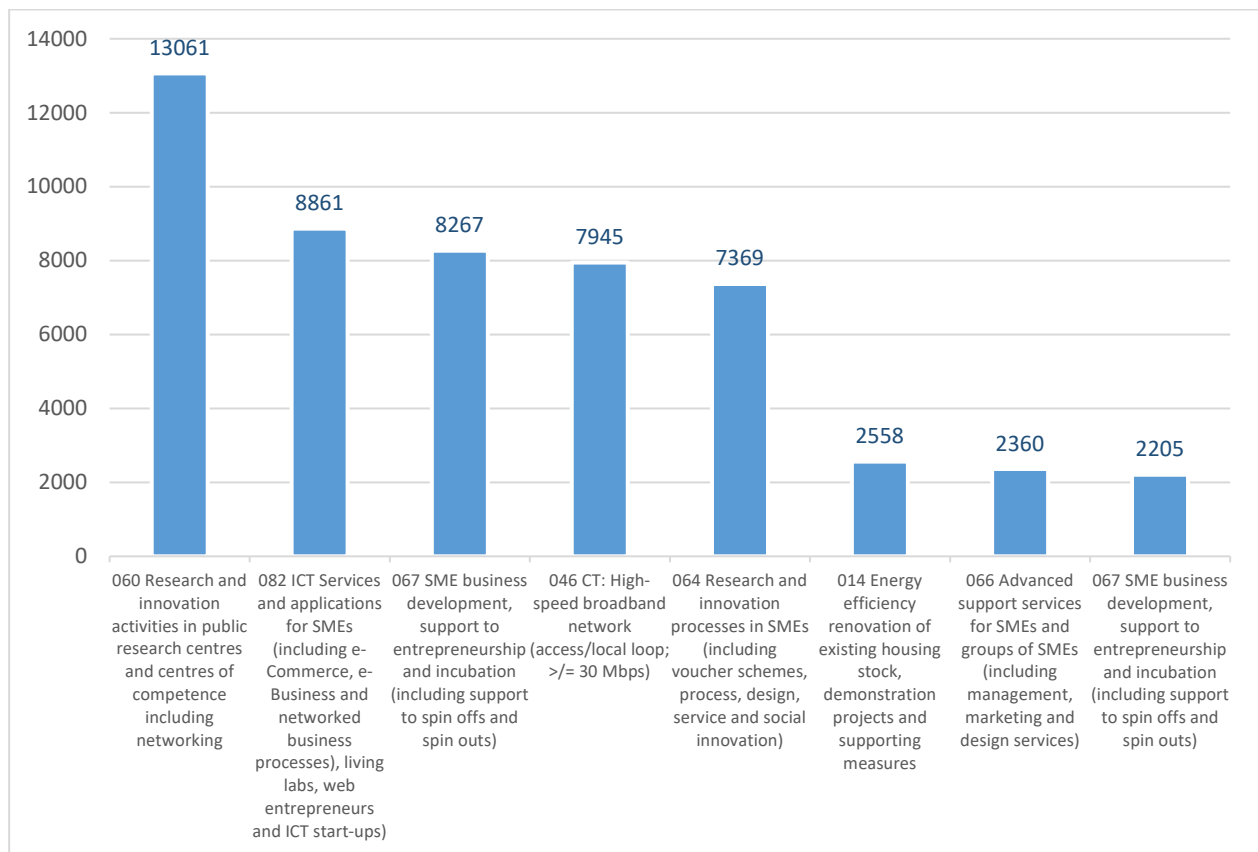
³⁷ Consejo Superior de Investigaciones Científicas <https://www.csic.es/en>.

³⁸ ICEX - ESPAÑA Exportación e Inversiones <https://www.icex.es>.

number of projects have been implemented during the 2022/2023 period that has been subject to the impact of inflationary pressures. As a result, these projects have had to operate within a considerably altered economic environment. Figure 16

Looking at the distribution of projects in the different intervention areas, '060 Research and innovation activities in public research centres and centres of competence including networking' and 'Research and innovation processes in SMEs (including voucher schemes, process, design, service and social innovation)' are the two R&I oriented intervention areas under which the largest numbers of projects have been implemented (13,061 and 7,369 projects respectively). Figure 16 provides an overview of the number of projects funded under the eight largest intervention areas in terms of number of projects. Four out of them are related to R&I, namely the intervention areas 060, 067, 064 and 067.

Figure 16: Number of projects per intervention area

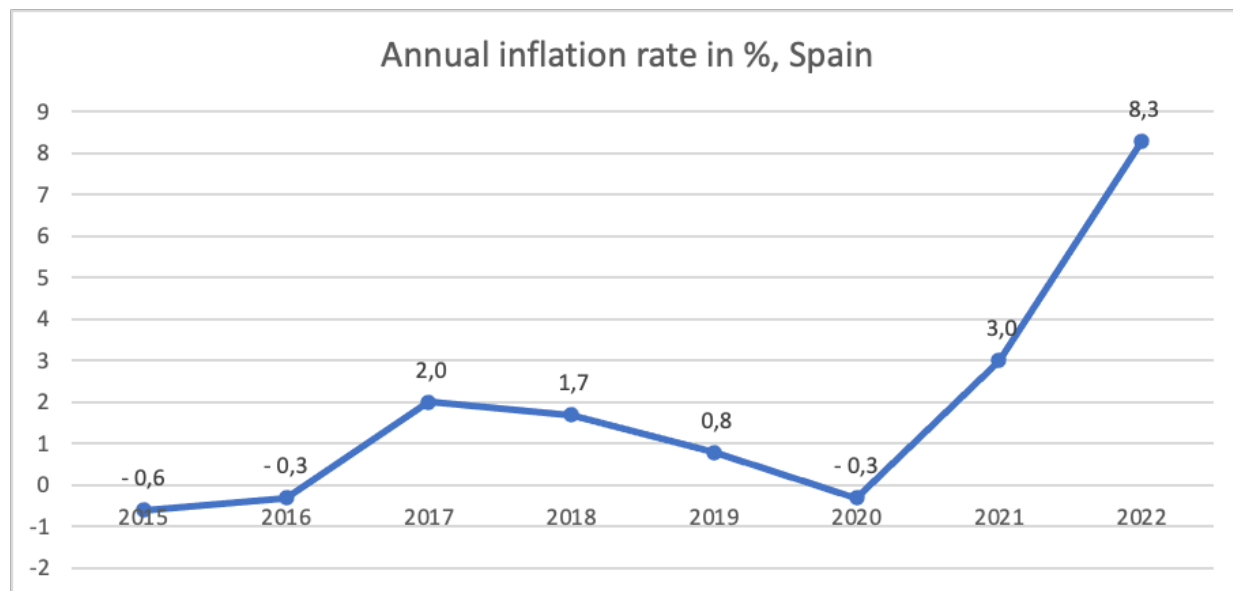


Source: Own analysis, based on data from the Spanish Secretariat General for European Funds, Ministry of Finance and Public Administration of Spain.

4.2.2 Impact of inflation on the Multiregional Operational Programme

Similar to other EU Member States, Spain has experienced a significant inflation surge that started already **in 2021 when the annual inflation rate reached a level of 3% and continued further up reaching a level of 8.3% in 2022, which represented an increase of 8.6 pp compared to 2020** (Eurostat, 2023). Figure 17 provides an overview of the annual inflation rate in Spain over the last 8 years.

Figure 17: Annual inflation rate in Spain [in %]



Source: Own calculations and representation based on Eurostat data, <https://ec.europa.eu/eurostat/databrowser/view/tec00118/default/table?lang=en>.

The inflation surge is expected to have negative impacts on the programmes funded from the EU budget by **decreasing their expected economic value and diminishing their purchasing power**. In other words, the programmes will be able to purchase less services and goods than planned which is likely to negatively affect their overall performance (Padilla Olivares, 2022). Having in mind that the **inflation surge will not affect all the sectors in the same way**, it is expected that **projects linked to energy-intensive industries** (e.g., through purchase of goods or services whose production is energy-intensive) **will be one of the most affected**. This is mostly due to increases in energy prices which represent the main contribution to HICP inflation (Baumgartner et al., 2022).

The recent inflation surge seems to have negatively impacted the Multiregional OP 2014-2020, affecting it in various ways. Generally speaking, **projects funded through this OP and which have been implemented throughout the period 2022/2023 are facing difficulties in their implementation**, primarily because in case of most of them, the **budgets were established prior to the onset of the inflation surge**, and thus before the unexpected increase in energy, construction and material prices (see Figure 17).

According to the insights provided by the Managing Authority, **the most substantial challenges occurred within the priority areas '06 - Preserving and protecting the environment and promoting resource efficiency' and '07 - Promoting sustainable transport and removing bottlenecks in key network infrastructures'** that are closely linked to construction and infrastructure development. These priority areas encompass various projects including those related to transportation, urban development or wastewater treatment. Notably, **these sectors have been particularly vulnerable to the inflationary pressures, leading to delays in project implementation**. In this context it was noted that the surge in inflation-driven costs presented **substantial challenges for contracted construction companies, forcing some projects to initiate contract renegotiations in order to align with the new economic circumstances**. Nevertheless, there were **also cases where the contracted firms decided to discontinue their participation, leading to the termination of contracts, and situations where no bidders came forward during the procurement process because it was not profitable for them**.

Indeed, the 2022 implementation report of the Multiregional OP 2014-2020 highlighted challenges in projects falling under the priority areas 06 and 07, which traditionally exhibited strong execution rates. These **challenges affected the absorption of allocated funds, especially in regions in transition**. Difficulties in adhering to construction timelines (especially for the infrastructure related projects), and the rising costs of materials have been mentioned as key factors affecting the construction contracts, subsequently leading to implementation delays and eventual absorption deficits.

Such difficulties were faced for instance by a project linked to the Sustainable Urban Development Strategy (priority area 12 within the Multiregional OP 2014-2020 related to urban development) and implemented in the municipality of Elche. The project initiated its public procurement process in 2020, with construction works starting in March 2023. Initially budgeted at EUR 7 million, this project has faced an unexpected cost escalation, ultimately reaching an amount of EUR 12 million due to the significant increase in construction material prices. Coupled with the tight timeframe (funds can be used until the end of 2023), the municipality will mostly likely be unable to complete the project within the given timeframe. Consequently, it will result in the municipality losing the grant allocated for this project. According to the municipality of Elche, there are 10 sustainable urban development type of project worth approximately EUR 10 million. Since these projects are financed 50% by the European Union and the remaining 50% is covered by the municipality, the latter estimates that the loss incurred by the inability to complete the planned EDUSI projects by the end of the year will be at least EUR 5 million (El Español, 2023). The Spanish Federation of Municipalities and Provinces also acknowledged challenges related to rising costs in construction projects and public infrastructure mainly due to the increase in material and energy prices, requiring reallocation of resources for many investments. In this context, it was noted that 'this situation is particularly difficult in the case of projects funded by European funds which were budgeted before the cost surge' (FEMP, 2022).

As a mitigation measure, the **Managing Authority found it necessary to reallocate resources from both priority areas to others**. In the case of priority area 06, adjustments were made for the less developed regions and regions in transition. Under priority area 07, reductions in allocations were necessary for regions in transition. Another challenge noted in relation to the priority area 06 is the **difficulty of including other types of projects (e.g., in the field of biodiversity or circular economy) as suggested by the Commission's observations, as this would entail a change in the programme's strategy**. In addition, **many of the eligible projects that could meet the required timeframe** (e.g. funds to be used by 31 December 2023) have already been allocated to the recovery, Transformation and Resiliency Plan. Another mitigation measure used **in case of several projects from each priority area is their transfer into the 2021-2027 period to facilitate their completion and avoid cancellations** (Spanish Secretariat General for European Funds, 2023).

At the same time, it is important to note that the execution of the OP and implementation of projects have been affected by multiple factors, with inflation being just one of them. In this context it can be noted that some of these projects were already experiencing delays prior to the inflation surge, primarily due to the negative effects of the COVID-19 pandemic. Other challenges that affected project implementation included modifications in the Public Sector Contracts law, slow processes of appointing the intermediate bodies and establishing management and control systems (Spanish Secretariat General for European Funds, 2023).

Research and innovation

In 2023, **the total budget allocated for Research, Development, Innovation (R&D&I) and Digitalization in Spain increased compared to the previous year**. A significant part of the resources allocated in this year's national budget comes from the European funds. In 2022, the budget for R&D&I

and digitalization, inclusive of both financial and non-financial operations, amounted to EUR 5,418.86 million from the EU funds. In 2023, this figure experienced a substantial rise, reaching EUR 9,094.91 million, representing an increase by 67.8%. However, the relatively high inflation rate in Spain is posing a risk to this funding. While the percentage increase is significant, **it's crucial to factor in the effect of inflation, which has diminished the real value and purchasing power of this budgetary expansion.** Thus, while the figures may suggest substantial growth, the real impact of this increase may be moderated by the rising cost of goods, services and energy due to inflation (COSCE, 2023).

As noted above, the inflation affects each industry differently. It **represents a particular challenge for innovative companies, especially small and medium-size enterprises, for which the price increases are more complex to pass on to the final consumer, especially when operating in uncertain and highly competitive environments or when involved in global production processes** (Gálvez Muñoz, 2023).

Looking specifically at the Multiregional OP, the Managing Authority noted that despite being affected by inflation, **the consequences were not that substantial as they were in the case of priority areas 06 and 07, i.e., there was no need for reprogramming and reallocating funds from the priority area 01 related to R&I to others.** Based on the 2022 annual implementation report, a low execution (less than 10%) was noted only in case of projects managed by the Ministry of Science and Innovation, due to changes in its structure that required modifications to the OP and prevented the certification of expenses by the new organisation until all the requirements for the corresponding function are met (Spanish Secretariat General for European Funds, 2023).

The 2022 annual implementation report notes challenges in the bidding process for the construction of a large-scale project under the priority area 01, resulting in a need to transfer this project to the next period of 2021-2027. Nevertheless, the challenges have been caused primarily by the COVID-19 pandemic and the integration of the Spanish Institute of Oceanography into the Higher Council for Scientific Research which resulted in a significant delay in the project implementation (construction contract awarded in October and signed in December 2021 with an expected completion date in June 2024), thus putting at risk the project's ability to be completed within the execution limits of the OP (i.e. end of December 2023) Spanish Secretariat General for European Funds, 2023).

Conclusions

To sum up, while the Multiregional OP 2014-2020 faced a range of challenges stemming from the recent inflation-driven costs increases, the most pronounced difficulties were concentrated in construction and infrastructure projects within priority areas 06 and 07. These challenges led to problems in the construction contracts which subsequently resulted in delays in project implementation. Some projects had to renegotiate contract due to financial pressures. In some cases, contracted firms withdrew from projects due to the unanticipated rise in energy and construction material prices, leading to contract termination. In other occasions, there was a lack of tenderers during the procurement processes due to the lack of interest on the side of construction companies stemming from a low profitability. Reprogramming aimed at adjusting the fund allocations was needed in case of priority areas 06 and 07 that were characterised by a low absorption rates, especially in case of regions in transition. A certain number of projects will be phased out into the next funding period of 2021-2027 to avoid their cancellation, ensure successful completion and maximise the investments.

The impact of inflation on R&I projects seems to differ from its effects on other priority areas within the OP. Indeed, the priority area 01 related to R&I did not necessitate significant reprogramming or fund reallocation. However, inflation might pose unique challenges for innovative companies, particularly

small and medium-sized enterprises, for which the price increases are more complex to pass on to the final consumer. Furthermore, despite the increase allocation of EU funds to R&I, inflation might have diminished the real value and purchasing power of this budgetary expansion, potentially jeopardizing R&I funding which relies heavily on EU resources.

Measures adopted at the EU level contributing to addressing the inflation-driven challenges include a possibility to of 100% co-financing and the possibility to transfer certain large-scale projects from MFF 2014-2020 to MFF 2021-2027. Making additional funds available to compensate for the increase in energy and material costs and the possibility of revisions of prices in public work contracts were among the measures adopted at the national level. Nevertheless, analyses conducted by the Ministry for the Ecological Transition and the Demographic Challenge suggest that having an additional year for expense certification could significantly enhance performance, especially in case of projects within the priority area 06 where other measures, such as including other types of actions such as biodiversity, circular economy would be difficult as they would entail a change in the programme's strategy.

5 POLICY OPTIONS FOR MITIGATING THE IMPACT OF INFLATION ON THE EU BUDGET

Based on the assessment of the impact of inflation on MFF expenditures and EU revenues as well as on the case studies, this chapter presents policy options for mitigating the impact of inflation on the EU budget and on national programmes. These policy options are informed by desk research and expert interviews conducted for the two case studies as well as with a representative of the European Court of Auditors. Two groups of policy options are developed. A first group of policy options refers to the implementation of the ongoing MFF and the EU revenue system in general and of national programmes in particular and is therefore of a more operational nature. A second group of policy options is of a more structural nature, aiming at making future MFFs and the EU revenue system more resilient to inflationary developments.

5.1 Policy options for the implementation of the ongoing MFF 2021-2027

5.1.1 Policy options for the implementation of the ongoing MFF 2021-2027

In this section we develop policy options for the implementation of the ongoing MFF, including the EU revenue system and national programmes. Hereby, we also consider the proposals put forward by the Commission in their midterm review (European Commission, 2023e), by the European Parliament (European Parliament, 2022), and by the European Court of Auditors (European Court of Auditors, 2023).

Use of existing margins and various flexibilities. To compensate for inflation-induced budgetary pressures as well as real losses of pre-allocated funding, margins and various flexibilities (the Flexibility Instrument, thematic special instruments, other flexibilities) could be used. However, apart from the fact that the overall volume of these reserves is very limited (altogether they reach 3.5% of the commitment ceiling at the time of adoption of the MFF, which is a small fraction only of the losses caused by inflation) and that their purchasing power is also reduced by the current high inflation, they have been almost depleted already according to the Commission's midterm review (European Commission, 2023a). Moreover, the use of existing flexibilities to compensate for inflation-induced losses competes with other budgetary needs arising from unexpected challenges associated, for example, with Russia's war of aggression against Ukraine, and would reduce the EU's ability to react to unforeseen events further.

Redeployment of pre-allocated funds across headings. The re-allocation of pre-allocated funds from clusters where the room for "doing more with less" is larger than in others, inter alia due to their sheer size, would be another option to avoid cuts in smaller expenditure items that deliver important contributions to European added value and to urgent challenges the EU is confronted with. Concretely, such a shift could consist of re-allocating funds from the Common Agricultural Policy (CAP) (which is still the largest item in overall MFF expenditures and has been criticised for a long time for not making most effective use of the available funds; see, e.g., Matthews, 2020) to clusters that are particularly important regarding strategic EU goals but are rather under-funded (e.g., research and innovation or the CEF). Also cohesion funds, whose size is equal to that of the CAP, may include potential for re-allocation to other clusters; whereby it needs to be taken into account that it is already possible to redeploy 5% of funds dedicated to cohesion policy. Such a differentiated approach would have the advantage to strengthen the overall European added value generated by the MFF. One difficulty in the implementation of this policy option, however, is that it will be difficult to reach an agreement between Member States on clusters from which funds shall be drawn off as well as on clusters for which ceilings shall be increased, as such a re-allocation of funds would upset the painstakingly negotiated balance

between Member States, which benefit to a different extent from the various funds. Moreover, this approach would not avoid the inflation-induced shrinking of the overall real volume of the MFF if pre-allocated funds are not fully inflation adjusted.

Increase of selected cluster ceilings based on the actual inflation rate. The ceilings of clusters with a particular significant contribution to European value added (e.g., Horizon Europe or the Connecting Europe Facility) or to particularly urgent challenges (e.g., Migration) could be adjusted according to the relevant inflation rate, while other ceilings would continue to be adjusted by the 2% deflator. This approach in principle is associated with the same problems and advantages compared to a redeployment of funds across headings, however less pronounced, as those clusters that are adjusted by the 2% deflator only would not lose in nominal terms. Therefore, this approach may be more acceptable for those Member States benefiting to an above-average degree from those clusters that are not fully inflation adjusted. Compared to a full inflation adjustment of all clusters and headings, respectively, such a differentiated approach could have the advantage of improving the overall structure of the MFF in terms of the European added value it creates. Not least, this approach would be preferable in terms of transparency. At the same time, such a differentiated inflation adjustment would lead to a decrease of the overall MFF volume in terms of EU GNI.

Establishment of a EURI thematic special instrument over and above cluster ceilings. The establishment of a EURI special instrument, as suggested by the Commission (2023e), would remove the budgetary pressure caused by the unexpected increase of interest payments under cluster 6. This new thematic EURI special instrument shall cover the additional NGEU funding costs resulting from the increase of interest rates for EU NGEU debt between 2024 and 2027. Thus, pressure to cut other important EU programmes and to exploit flexibility reserves that actually are intended to be able to react to unforeseen challenges would be removed.

Increase of heading 7 European administration. To mitigate the budgetary pressure with heading 7 European administration, a mixture of expenditure increases and savings, as proposed by the Commission (2023e), could be envisaged. While it will be difficult to cope with the additional tasks and challenges with the current resources, which again are under pressure in the current high inflation environment, options to reprioritise and to identify obsolete tasks should be reviewed in all European institutions.

“Assess the impact on the EU budget of high inflation over several years.” (European Court of Auditors, 2023: 95). The Commission should monitor and assess the impact of high inflation on the EU budget during the remaining duration of the current EU budget, as a basis to come forward with instruments and approaches to cope with adverse effects of inflation on the EU budget. Hereby, the focus should be on MFF expenditures as well as the EU revenue system. One specific aspect regarding the MFF is to determine adequate inflation indicators that could replace the current 2% deflator to adequately adjust the different spending categories and clusters, respectively, to high inflation. Regarding the EU revenue system, structural shifts within overall revenues should be monitored and their impact on the distribution of the overall financial burden across Member States be assessed.

5.1.2 Policy options for the EU revenue system

Reduce the weight of the VAT-based own resource. To mitigate undesirable redistributive effects of an inflation-induced shift in EU overall revenues across Member States the weight of the VAT-based own resource could be reduced by decreasing the current call rate of 0.3% or by reducing the current cap of 50% of the VAT base.

Accelerate the introduction of the new own resources contained in the adjusted first basket of new own resources. The revenues from these new own resources could be used to finance the inflation adjustment of certain MFF clusters, a EURI thematic special instrument, the (advanced) repayment of EU funding costs (Claeys et al., 2023), or the increase of the flexibility instruments without having to raise GNI-based own resource payments. The ETS-based and the CBAM-based new own resource would additionally contribute to a greening of the EU revenue system and thus to central EU objectives.

Automatic inflation adjustment of call rates that are denominated in absolute values. To avoid the devaluation of revenues from own resources for which call rates are denominated in absolute values (currently the plastic own resource), the call rates should be inflation-adjusted regularly. Hereby it needs to be determined which deflator shall be adjusted from when and for which year.

5.2 Policy options for the implementation of national programmes

Based on the case studies, this section discusses options to adjust to the accumulated inflation during the implementation of national programmes.

5.2.1 Policy options for the implementation of national RRP

Different indexation methodologies can be applied – for the whole economy, sector-wide or based on types of activities (construction works, maintenance, transport). Indexation can be made through a horizontal national methodology taking into account uniform or sector-specific cost factors or through the requests of separate entities and institutions for specific projects and their evaluation of accumulated inflation.

Another option for policymakers in regard to the national RRP, where project implementation is still at its early phase or has not yet started, is however to permit the contracting ministries or institutions to identify themselves the necessary cost adjustments. This can be done on a project by project basis by the project beneficiaries – ministries and state-owned enterprises. As an example, the Electricity System Operator in Bulgaria manages one of the big investments under the NRRP - "Digital transformation of the electricity transmission network"[1]. Based on the national Methodology mentioned above the ESO has requested an increase in the RRF co-financing to BGN 549 million from the original value of BGN 370 million. The project envisages 45% of the resource for construction works, which makes the National Methodology for Indexation applicable for this share of the project.

The final question after finding the right approach to estimate the extra costs induced through inflation is to find sources for additional funding to address the funding shortfall. There are several policy options, each of them with specific trade-offs.

Funding for indexation through additional national financing from the Member States' budgets. On the one hand, this option has the benefit of higher national ownership of the RRP and therefore stronger commitment from national governments for its effective implementation. More national financing from the government budget will also increase the recognition of the RRF in Member States. If increased public investment for this additional national financing constitute a risk to meeting Maastricht deficit criteria rules, it is worth discussing whether throughout the Economic Governance Framework review the Investment Clause to the Stability and Growth Pact should not be amended also to make exceptions in the fiscal framework for the top-up funding for the national co-financing of the RRP.

Funding for indexation through the additional resources from RePowerEU. Through the new mechanism RePowerEU, Member States will receive additional funding for their National RRP. Member States can use the possibility to renegotiate their existing RRP as well as to propose how to use this additional funding. The aim of RePowerEU however is to finance additional new investments to help EU overcome its dependence on foreign energy supplies and the new RePowerEU chapters are subject to certain rules, which do not allow backtracking on the ambition of the existing Plans. It is therefore questionable whether the additional funding can be used for indexation purposes.

Finally, there have already been significant delays in the implementation of projects for the RRP. This means that Member States can and should adjust their national RRP accordingly and justify if some projects have become unrealistic timewise or financially for Member States. This has the important implications that Member States can decide to drop investment projects throughout the renegotiation of their plans. This could however decrease the ambitions of NRRPs for achieving the green and digital transition. Here the trade-off will be between underachieving some of the stated ambitions and planned investments, however while also ensuring a higher absorption rate for the RRF, since projects which have become unrealistic will be dropped out, leaving space for funding of those projects which are realistic under a revised costing.

5.2.2. Policy options for the implementation of operational programmes

Possibility to transfer certain large-scale projects from one MFF period to another. The EU has adopted a measure that allows for the transfer of certain large-scale projects from the MFF for the years 2014-2020 period to the MFF for the years 2021-2027. Recognising the need for flexibility in the allocation of funds, especially in view of significant projects that may have experienced delays or require additional resources, this measure can avoid their cancellation and ensuring successful completion, thus maximising the investments made. In the context of the Multi-regional OP of Spain 2014-2020, at least three large-scale projects have been already phased into the MFF 2021-2027 period since they had experienced significant delays which impeded their successful completion by the end of December 2023.

Flexibility in reallocation of funds and enabling 100% co-financing rates: In 2022, the European Commission introduced a series of measures aimed at enabling the Member States and regions to reallocate up to EUR 40 billion of unused funds from the 2014-2020 programming period. Furthermore, these measures allowed for 100% co-financing rates, effectively covering all costs through the EU budget. Within the framework of the ERDF, these measures were designed to provide support to small and medium businesses facing challenges due to increasing energy prices. They applied universally across regions, regardless of category (European Commission, 2022). Despite the positive reception of these measures, it's worth noting that they didn't fully address the issue of delays caused to a large extent problems in public procurement and construction contracts (there was a number of unsuccessful tenders, mainly related to prices of raw material prices where the unavailability of these supplies hindered progress in certain operations). In this context, extending the eligible period for fund utilization (e.g., beyond December 2023) might have been a more effective solution.

Provision of additional funding to compensate the increase in the energy costs: Governments have taken steps to address the increase in energy costs by providing additional funding sourced from other sources, e.g. from the ERDF 2014-2020. For instance, in Andalucía, the funding allocated to such purposes amounted to EUR 525 million and was specifically intended to offset the additional expenses incurred due to the surge in gas and electricity prices. This measure was introduced to support small and medium-sized businesses, as well as self-employed individuals, who have been disproportionately affected by the rising energy prices. The assistance programme was available from 1 February to 31

December 2022 and involved direct payments. The amount of financial aid provided varied, ranging from EUR 300 to EUR 2 million, depending on the extent of increased costs experienced by the respective company or self-employed individual (Benítez Macías, 2023). Provision of additional funds might be especially useful in case of already approved projects, and especially those that are in the early phases of implementation, whereby the implementers would need to cover the additional expenses from their own resources to meet the project's objectives.

Revision of public work contracts: In March 2022, the Government of Spain introduced 'exceptional measures for the revision of prices in public works contracts as a result of the impact of the extraordinary rise in the cost of certain raw materials' (Real Decreto-Ley 3/2022). The main objective was to address the significant rise in construction material costs. These measures applied to both public and private contracts that were in progress as of 2 March 2022, regardless of whether they contain and price revision or not. In terms of type of material, following materials were applicable: steel, bituminous materials, aluminium, or copper. To be eligible, the increase in the cost of these materials must have exceeded 5% of the certified contract amount in 2021. In addition, the total amount to be revised could not exceed 20% of the contract's award price. There were two different methodologies used for the calculation, depending on whether the contract contains a price revision formula or not. This measure was later on expanded to include addition materials, namely cement, ceramic materials, wood, plastics, chemical products and glass (Real Decreto-ley 3/2022 and Uría Menéndez, 2022).

Operational Programmes faced challenges in finding construction companies and bidders willing to participate in the public procurement processes. This was mostly due to the fact that by the time the call for tender was published, the prices had already increased which discourages the companies from participating. Periodic review and analysis of the increase in prices, for instance in a form of a working group, and subsequent adoption of changes in the contractual conditions of future projects seem to be necessary for ensuring successful public procurement processes.

5.3 Policy options to make future EU budgets more resilient to inflation

Replace the current 2% deflator by adequate inflation indicators to adjust EU budget expenditures to inflation. To avoid losses in purchasing power and budgetary pressures caused by high inflation, and to preserve the EU's ability to react to unforeseen developments requiring additional interventions, MFF ceilings as well as the various flexibility instruments should be adjusted to actual inflationary developments by using adequate inflation indicators. From the perspective of transparency, such an automatic inflation adjustment would be preferable to a (differentiated) ad-hoc increase of (selected) ceilings.

Implement additional new own resources. Additional new own resources should be implemented, preferably new own resources that are associated with steering effects supporting important EU objectives and whose revenues develop in tandem with inflation. Where needed and possible, their design should avoid negative effects of inflation (e.g., by automatically adjusting call rates denominated in absolute values to inflation).

Adjust call rates denominated in absolute values automatically to inflation. To avoid the devaluation of revenues from own resources for which call rates are denominated in absolute values, call rates should be inflation-adjusted automatically.

Implement a special instrument for interest expenditure over and above MFF ceilings. A permanent special instrument should be established that covers funding costs incurred by EU borrowings (particularly within NGEU, but also within the envisaged Ukraine facility and other existing and future EU debt operations). Although this may come at the cost of increasing complexity and

decreasing transparency of the EU budget, as the special instrument would enlarge the galaxy of the EU budget, such a special instrument would avoid budgetary pressures from interest expenditure which may be volatile in the medium run and therefore difficult to budget over a seven-year period, and even require cuts in other spending items to remain within MFF ceilings.

Envisage a comprehensive review and modernisation of the outdated accounting framework of the EU budget. A solution that would be more ambitious than the implementation of additional special instruments (as for example a special thematic EURI instrument covering EU funding costs) in particular and generally reacting in an ad-hoc manner to upcoming unforeseen challenges and events within a piecemeal approach is the comprehensive modernisation of the accounting framework of the EU budget (Claeys et al., 2023), which could be integrated in the ongoing efforts to strengthen the performance orientation of the EU budget.

6 REFERENCES

- Ampudia, M., Bua, G., Kapp, D., & Salakhova, D. (2022). The Role of Speculation during the Recent Increase in EU Emissions Allowance Prices. *ECB Economic Bulletin*, 3/2022. https://www.ecb.europa.eu/pub/economic-bulletin/focus/2022/html/ecb.ebbox202203_06~ca1e9ea13e.en.html
- Bachtrögler-Unger, J., Schratzenstaller, M., & Sinabell, F. (2021). Der europäische COVID-19-Aufbauplan. *WIFO-Monatsberichte*, 94(4), 321–334.
- Baert, P. (2023). Establishing a EU Customs Data Hub and a EU Customs Authority. *Briefing EU Legislation in Progress*, PE 753.931. [https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/753931/EPRS_BRI\(2023\)753931_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2023/753931/EPRS_BRI(2023)753931_EN.pdf)
- Baumgartner, J., Scheiblecker, M., & Url, T. (2022). Maintaining Credibility is Currently the Top Priority. *European Parliament Monetary Dialogue Papers*. <https://www.europarl.europa.eu/cmsdata/258100/Maintaining%20credibility%20is%20currently%20the%20top%20priority.pdf>
- Begg, I., Benedetto, G., Belicka, D., Corti, F., Ferrer, J. N., & Rubio, E. (2022). *The Next Revision of the Financial Regulation and the EU Budget Galaxy: How to Safeguard and Strengthen Budgetary Principles and Parliamentary Oversight*. European Parliament Study Requested by the BUDG Committee. European Union.
- Benítez Macías, J. A. (2023), En 2022 casi se ha quintuplicado la factura eléctrica en las empresas - Entrevista con el delegado territorial de Empleo, Empresa y Trabajo Autónomo de la Junta de Andalucía en Cádiz', in Arcos, <https://vivaarcos.es/arcos/1360764/en-2022-casi-se-ha-quintuplicado-la-factura-electrica-en-las-empresas/>
- Bulgarian National Bank (2023). *Macroeconomic Forecast, June 2023*. Bulgarian National Bank.
- Claey's, G., McCaffrey, C., & Welslau, L. (2023). *The Rising Cost of European Union Borrowing and What to Do About It. Briefing Requested by the BUDG Committee*. Policy Department for Budgetary Affairs, Directorate-General for Internal Policies. European Parliament.
- COSCE (2023), Informe sobre la Política de Gasto 46 „Investigación, desarrollo, innovación y digitalización“ en los Presupuestos Generales del Estado para 2023', https://cosce.org/docs/Informe_COSCE_sobre_la_Politica_de_Gasto_46_INVESTIGACION_DES_ARROLLO_INNOVACION_Y_DIGITALIZACION_en_los_PGE2023.pdf
- D'Alfonso, A. (2021). Own Resources of the European Union. Reforming the EU's Financing System. *Briefing, EPRS - European Parliamentary Research Service*, PE 630.265. [https://www.europarl.europa.eu/RegData/etudes/BRIE/2018/630265/EPRS_BRI\(2018\)630265_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/BRIE/2018/630265/EPRS_BRI(2018)630265_EN.pdf)
- El Español (2023), Elche estima que perderá 5 millones de fondos europeos por no poder ejecutar a tiempo los proyectos, https://www.elespanol.com/alicante/elche/20230725/elche-estima-perdida-millones-fondos-europeos-no-poder-ejecutar-tiempo-proyectos/781672033_0.html
- European Central Bank (2023). *Monetary policy decisions*. Press Release, 14 September 2023. <https://www.ecb.europa.eu/press/pr/date/2023/html/ecb.mp230914~aab39f8c21.en.html>
- European Commission (2018). Financing the EU budget: Report on the operation of the own resources system. SWD(2018) 172 Final. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018SC0172>

- European Commission (2020). Council Decision (EU, Euratom) 2020/2053 of 14 December 2020 on the system of own resources of the European Union and repealing Decision 2014/335/EU, Euratom. *Official Journal of the European Union*, L 424/1. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32020D2053>
- European Commission (2022), EU Cohesion Policy: new exceptional measures to support citizens and companies with energy costs, https://ec.europa.eu/regional_policy/en/newsroom/news/2022/10/18-10-2022-eu-cohesion-policy-new-exceptional-measures-to-support-citizens-and-companies-with-energy-costs
- European Commission (2023a). Commission Staff Working Document Accompanying the Document Communication from the Commission to the European Parliament, the European Council, the Council, the European Economic and Social Committee and the Committee of the Regions. Mid-term revision of the multiannual financial framework 2021-2027. COM(2023) 336 Final. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52023SC0336>
- European Commission (2023b). *EU Spending and Revenue—Data 2000-2022 (internet tables)*. European Commission. https://commission.europa.eu/document/download/db7394f7-b867-4d1e-a961-f2c874eed22d_en?filename=eu_budget_spending_and_revenue_2000-2022.xlsx
- European Commission (2023c). An Adjusted Package for the Next Generation of Own Resources. COM(2023) 330 Final. https://commission.europa.eu/system/files/2023-06/COM_2023_330_1_EN_ACT_part1_v5.pdf
- European Commission (2023d). *The Next Generation of EU Own Resources*. European Commission. https://commission.europa.eu/system/files/2023-06/Factsheet_NOR_20.06_11h45.pdf
- European Commission (2023e). Proposal for a Council Regulation amending Regulation (EU, Euratom) 2020/2093 laying down the multiannual financial framework for the years 2021 to 2027. COM(2023) 337 Final. https://commission.europa.eu/system/files/2023-06/COM_2023_337_1_EN_ACT_part1_v3.pdf.
- European Commission. (2023f). European Economic Forecast. Spring 2023. *Institutional Paper, 200*. https://economy-finance.ec.europa.eu/system/files/2023-05/ip200_en_1.pdf
- European Court of Auditors (2023). *2022 Annual Reports on the implementation of the EU budget for the 2022 financial year and on the activities funded by the 9th, 10th and 11th European Development Funds (EDFs) for the 2022 financial year*. Publications Office of the European Union. https://www.eca.europa.eu/ECAPublications/AR-2022/AR-2022_EN.pdf
- European Parliament (2022). Upscaling the 2021-2027 Multiannual Financial Framework: A Resilient EU Budget Fit for New Challenges. 2022/2046(INI).
- European Parliament (2023a). Impact on the 2024 EU budget of increasing European Union Recovery Instrument borrowing costs. European Parliament resolution of 10 May 2023 on the impact on the 2024 EU budget of increasing European Union Recovery Instrument borrowing costs. 2023/2037(BUI), P9_TA(2023)0194. https://www.europarl.europa.eu/doceo/document/TA-9-2023-0194_EN.pdf
- European Parliament (2023b). Own Resources: A New Start for EU Finances, a New Start for Europe European Parliament Resolution of 10 May 2023 on Own Resources: A New Start for EU Finances, a New Start for Europe (2022/2172(INI)). European Parliament. https://www.europarl.europa.eu/doceo/document/TA-9-2023-0195_EN.pdf

- European Parliament (2023c). *Impact on the 2024 EU budget of increasing borrowing costs for the European Union Recovery Instrument*. At a Glance, Plenary-May I 2023. [https://www.europarl.europa.eu/RegData/etudes/ATAG/2023/747130/EPRS_ATA\(2023\)747130_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/ATAG/2023/747130/EPRS_ATA(2023)747130_EN.pdf)
- Eurostat. (2023), HICP – Inflation rate, <https://ec.europa.eu/eurostat/databrowser/view/tec00118/default/table?lang=en>, accessed on 26 July 2023
- FEMP (2022), La FEMP plantea al Gobierno apoyo para afrontar el incremento de gasto energético y el sobrecoste de obras y proyectos en ejecución de las Entidades Locales, <https://www.femp.es/comunicacion/noticias/la-femp-plantea-al-gobierno-apoyo-para-afrontar-el-incremento-de-gasto>
- Gálvez Muñoz, L. (2023), Viewpoint: Inflation is an obstacle to innovation in Europe, *Science Business*, <https://sciencebusiness.net/viewpoint/viewpoint-inflation-obstacle-innovation-europe>
- Matthews, A. (2020). The Budgetary Impacts of the Common Agricultural Policy. In B. Laffan & A. D. Feo (Eds.), *EU Financing for Next Decade Beyond the MFF 2021-2027 and the Next Generation EU* (pp. 115–127). European University Institute.
- Ministry of Finance and Public Administration of Spain (2023), Programas Operativos Plurirregionales FEDER. Ficheros EXCEL, <https://www.fondoseuropeos.hacienda.gob.es/sitios/dgfc/es-ES/loFEDER1420/popIFEDER/Paginas/FicheroExcel.aspx>
- Ministry of Finance and Public Administration of Spain (2014). Multiregional Operational Programme of Spain 2014-2020, version 5.2 , https://www.fondoseuropeos.hacienda.gob.es/sitios/dgfc/es-ES/ipr/fcp1420/p/Prog_Op_Plurirregionales/Documents/PO_Plurirregional_de_Espana_Decision.pdf
- Padilla Olivares, F. (2022). *The Impact of Inflation on the EU Budget. Briefing requested by the BUDG committee*. European Parliament.
- Real Decreto-ley 3/2022, https://www.boe.es/diario_boe/txt.php?id=BOE-A-2022-3290
- Schratzenstaller, M., Nerudová, D., Solilová, V., Holzner, M., Heimberger, P., Korpar, N., Maucorps, A., & Moshhammer, B. (2022). *New EU Own Resources: Possibilities and Limitations of Steering Effects and Sectoral Policy Co-benefits*. European Parliament. [https://www.europarl.europa.eu/RegData/etudes/STUD/2022/731895/IPOL_STU\(2022\)731895_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/STUD/2022/731895/IPOL_STU(2022)731895_EN.pdf)
- Schwarcz, A. (2021). *Reform of the EU Own Resources. In-depth Analysis Requested by the BUDG Committee of the European Parliament*. European Parliament, Policy Department for Budgetary Affairs Directorate-General for Internal Policies. [https://www.europarl.europa.eu/RegData/etudes/IDAN/2021/690963/IPOL_IDA\(2021\)690963_EN.pdf](https://www.europarl.europa.eu/RegData/etudes/IDAN/2021/690963/IPOL_IDA(2021)690963_EN.pdf)
- Schwarcz, A. (2023). *The Union's Revenue. Fact Sheets on the European Union – 2023*. https://www.europarl.europa.eu/RegData/etudes/fiches_techniques/2017/N50625/doc_en.pdf .
- Spanish Secretariat General for European Funds (2023), Informe anual de ejecución para el objetivo de inversión para el crecimiento y el empleo PARTE A, https://www.fondoseuropeos.hacienda.gob.es/sitios/dgfc/es-ES/ipr/fcp1420/gf/feder/cs/Documents/Implementation%20report_2014ES16RFOP002_2022_1_es.pdf
- Uría Menéndez (2022), Medidas Excepcionales de Revisión de Precios de los Contratos Públicos de Obras, https://www.uria.com/documentos/circulares/1504/documento/12711/nl-UM_ok.pdf

ANNEXES

Annex 1 – EURI Borrowing costs

Interest rates globally, in the European Union and the euro area have increased markedly since the beginning of 2022. During that time-period the European Central Bank has decided on 10 consecutive interest rate hikes, taking the main refinancing operations rate from 0.00% in the first half of 2022 to 4.50% in September 2023. This historical shift to an environment, from zero interest rates to very high interest rates, has important implications for the MFF. It has increased borrowing costs for all sovereign and EU supranational issuers, including for bonds issued under NGEU.

When the MFF has been agreed upon in the midst of the COVID-19 pandemic, the European Parliament, the Council of the EU and the European Commission issued a joint declaration stating that the financing costs of NGEU – repayment and interest costs - should not reduce the agreed upon funding for EU programmes and initiatives based on it. It was therefore assumed that any such additional costs would have to be covered by new own additional resources, which however have not been agreed upon until then. With these developments in government bond markets, the costs of repaying NGEU borrowing have increased significantly from their estimated values when the RRF was created. A report by the European Parliament BUDG Committee (2023) points out that while projections for the interest rates on NGEU issuances for the period between 2021 and 2027 ranged between 0.55% to 1.15%, interest rates have increased to above 3% during 2023. The increased repayment costs therefore can lead to reduced financial envelopes for the existing and planned programmes and investments under the national RRFs.

Claeys et. al (2023) provide an overview of the projected borrowing costs for NGEU borrowing in the upcoming years. The RRF regulation stipulates that the EU budget will have to cover the borrowings costs of the total of EUR 421.1 billion in current prices in non-repayable support that will be transferred to Member States. The borrowing costs for the remainder of the NGEU envelope – the RRF loans distributed to Member States that requested them - will be repaid by Member States themselves. Claeys et. al (2023) report market expectations from a market participants survey about the future path of interest rates. The median expectation, measured in May 2023, was for rates to remain at similarly high levels as today and to fall slightly to 2.8% by 2026. Since this evaluation in May, interest rates have increased by another 0.75 percentage points (one interest rate increase each in June, August and September). The latest ECB communication from 14 September 2023 also hinted towards rates staying at the heightened level for longer (European Central Bank, 2023). Claeys et. al (2023) then derive the probability distribution about the future interest rate path from swap options prices, to estimate the risks of lower or higher interest rates than the median expectations. The results show a very high level of uncertainty around the forecast – with 50% probability, investors expect the interest rate in 2026 to be 1.9% at the low end up to 3.7% at the high end. When looking at the 90% probability, this range increases even further to between 0.1% and 6.2%.

Based on these assumptions about the future path of interest rates - combined with data on the current debt, the maturity structure and future borrowing needs - the authors then report the expected borrowing cost burden. It points to a significant raise in the needs in comparison to the projected baseline at the beginning of NGEU issuance in 2021. The initial forecast was that the overall costs for the 2021 –2027 MFF to be around EUR 15 billion, with an annual interest rate costs in the last year – 2027, of around EUR 5 billion. Given the increased interest rates however, and taking into account the median expectation for interest rates, the baseline scenario is for total costs of EUR 50 billion, with annual costs for 2027 to reach EUR 9.9 billion according to Claeys et. al (2023). This will result in interest

rates constituting 5.3% of the 2027 EU annual budget, and around 2.5% on average over the lifetime of MFF2021 – 2027. When calculating however based on the tail probabilities reported above, for the 50% probability, the interest costs could vary between EUR 7.8 billion to EUR 12.4 billion in 2027, and even more crucially with 90% probability, could range between EUR 3.2 billion to EUR 18.1 billion in 2027. As a share of total payments under the MFF2021 – 2027, the 50% probability scenario results in up to 3% in borrowing costs payments in the lifetime of the MFF2021 – 2027, while the 90% tail probability scenario increases this to 4.07%. This shows the sensitivity of the EU's borrowing costs to changes in interest rates.

Importantly, the current surge of inflation also leads to a considerable increase in the gross national income (GNI) of Member States and thereby increases the availability of the EU to call Member States to increase their nominal contributions to the EU budget. This represents a guarantee that this borrowing will be paid back accordingly. A cause for concern however is the fact that the expenditure ceilings for different EU programmes are capped at the nominal value of 2018 prices plus the fixed maximum for indexation of 2% in line with the ECB target. Increased interest payments therefore erode implicitly the funds available for actually achieving the various objectives of the EU programmes.

Different policy proposals to address this can be pursued. The most straightforward one, in line with recommendations of the European Parliament (2022) is to exclude the budget line for borrowing costs from heading 2b and therefore to count it outside of the MFF expenditure ceiling. This will ease the pressures of the increasing interest costs as a share of overall expenditures will create for various programmes in the upcoming years. More structural solutions, which require however deeper amendments to the current framework, would be to address the inconsistency resulting in own resources being automatically increased through the effect of inflation on GNI, but expenditures being still capped through the maximum indexation of expenditures by a mere 2%, in line with the inflation target. The biggest challenge, of course, will be to find a solution to introduce genuine new own resources, part of which can then be used to cover the increased borrowing costs in upcoming years – an agreement reached in a joint declaration by the European Parliament, the Council and the European Commission in 2020, but which has not yet been implemented.

Annex 2 – Case study on Bulgaria – full project data

Table 13: Inflation impact evaluation on the Bulgarian RRP, project by project, 2022 – 2026, main results

| Investment project | RRF financing in EUR | Inflation Indicator | Inflation 2022 | Accum. Inflation so far | Inflation Indicator | Inflation 2023 | Accum. Inflation so far | Inflation Indicator | Inflation 2024 in % | Accum. Inflation so far | Inflation Indicator | Inflation 2025 | Accum. Inflation so far | Sum in EUR | Average Inflation |
|--|----------------------|---------------------------------|----------------|-------------------------|---|----------------|-------------------------|---------------------|---------------------|-------------------------|---------------------|----------------|-------------------------|------------|-------------------|
| Education and skills | | | | | | | | | | | | | | | |
| STEM centres and innovation in education | 245,485 | HICP Imp. of Goods and Services | 12.0% | 12.0% | HICP All Items | 9.4% | 22.5% | HICP All Items | 3.4% | 26.6% | HICP All Items | 3.0% | 30.4% | 301,637 | 22.9% |
| Modernization of educational infrastructure | 291,139 | GDP Defl. Constr. Defl. | 17.0% | 17.0% | HICP All Items | 9.4% | 28.0% | HICP All Items | 3.4% | 32.3% | HICP All Items | 3.0% | 36.3% | 373,872 | 28.4% |
| Digital skills training and an adult learning platform | 164,657 | HICP All Items | 13.0% | 13.0% | HICP All Items | 9.4% | 23.6% | HICP All Items | 3.4% | 27.8% | HICP All Items | 3.0% | 31.7% | 204,219 | 24.0% |
| Youth centres | 32,253 | GDP Defl. Constr. Defl. | 17.0% | 17.0% | HICP All Items | 9.4% | 28.0% | HICP All Items | 3.4% | 32.3% | HICP All Items | 3.0% | 36.3% | 41,419 | 28.4% |
| Research and innovation | | | | | | | | | | | | | | | |
| Innovation capacity of the Bulgarian Academy of Sciences in green and digital technologies | 23,902 | HICP All Items | 13.0% | 13.0% | GDP Defl. | 10.4% | 24.8% | GDP Defl. | 3.9% | 29.6% | HICP All Items | 3.0% | 33.5% | 29,440 | 23.2% |
| Program for economic recovery and transformation through science and innovation | 187,385 | HICP All Items | 13.0% | 13.0% | GDP Defl. | 10.4% | 24.8% | GDP Defl. | 3.9% | 29.6% | HICP All Items | 3.0% | 33.5% | 230,799 | 23.2% |
| Intelligent industry | | | | | | | | | | | | | | | |
| Program to support industrial zones and parks and improve their infrastructural connectivity (AttractInvestBG) | 110,695 | CCI Constr. Defl. | 40.7% | 40.7% | HICP Industry Goods and Constr. Defl. Constr. Defl. | 7.0% | 50.5% | GDP Defl. | 3.9% | 56.3% | HICP All Items | 3.0% | 61.0% | 172,158 | 55.5% |
| Economic transformation program | 690,016 | HICP Ind | 10.2% | 10.2% | HICP Ind | 9.6% | 20.8% | HICP All Items | 3.4% | 24.9% | HICP All Items | 3.0% | 28.6% | 822,582 | 19.2% |

| Investment project | RRF financing in EUR | Inflation Indicator | Inflation 2022 | Accum. Inflation so far | Inflation Indicator | Inflation 2023 | Accum. Inflation so far | Inflation Indicator | Inflation 2024 | Accum. Inflation so far | Inflation Indicator | Inflation 2025 | Accum. Inflation so far | Sum in EUR | Average Inflation |
|--|----------------------|--|----------------|-------------------------|--|----------------|-------------------------|---------------------|----------------|-------------------------|---------------------|----------------|-------------------------|------------|-------------------|
| Low-carbon economy | | | | | | | | | | | | | | | |
| Sustainable energy renovation of the residential building stock | 608,183 | CCI Constr. Defl. | 40.7% | 40.7% | CCI Constr. Defl. | 11.4% | 56.7% | GDP Defl. | 3.9% | 62.9% | HICP All Items | 3.0% | 67.7% | 974,825 | 60.3% |
| Sustainable energy renovation of the non-residential building stock | 315,802 | CCI Constr. Defl. | 40.7% | 40.7% | CCI Constr. Defl. | 11.4% | 56.7% | GDP Defl. | 3.9% | 62.9% | HICP All Items | 3.0% | 67.7% | 515,060 | 63.1% |
| Single-family and multi-family building renewable energy financing program | 71,579 | CCI HICP Imp. of Goods and Serv. | 37.2% | 37.2% | CCI HICP Imp. of Goods and Services | 12.7% | 54.6% | GDP Defl. | 3.9% | 60.6% | HICP All Items | 3.0% | 65.4% | 109,891 | 53.5% |
| Energy-efficient municipal systems for outdoor artificial lighting | 76,324 | Constr. Defl. | 18.9% | 18.9% | Constr. Defl. | 4.3% | 24.0% | GDP Defl. | 3.9% | 28.8% | HICP All Items | 3.0% | 32.7% | 94,609 | 24.0% |
| Digital transformation of the Energy System Operator | 189,178 | CCI HICP Industr. Goods and Constr. Defl. | 36.4% | 36.4% | CCI HICP Industr. Goods and Constr. Defl. | 14.1% | 55.5% | GDP Defl. | 3.9% | 61.6% | HICP All Items | 3.0% | 66.4% | 285,608 | 51.0% |
| National infrastructure for storing electrical energy from RES (RESTORE) | 799,055 | HICP Industr. Goods and Constr. Defl. HICP Imp. of Goods and Serv. | 11.1% | 11.1% | HICP Industr. Goods and Constr. Defl. HICP Imp. of Goods and Serv. | 8.2% | 20.2% | GDP Defl. | 3.9% | 24.9% | HICP All Items | 3.0% | 28.6% | 1,012,749 | 26.7% |
| Scheme to support green hydrogen and biogas pilot projects | 35,000 | HICP Industr. Goods and Constr. Defl. HICP Imp. of Goods and Serv. | 11.1% | 11.1% | HICP Industr. Goods and Constr. Defl. HICP Imp. of Goods and Serv. | 8.2% | 20.2% | GDP Defl. | 3.9% | 24.9% | HICP All Items | 3.0% | 28.6% | 43,737 | 25.0% |
| Support for the construction of a minimum of 1.4GW of RES and batteries | 342,000 | HICP Imp. of Goods and Serv. Constr. Defl. | 15.4% | 15.4% | HICP Imp. of Goods and Serv. Constr. Defl. | 5.6% | 21.8% | GDP Defl. | 3.9% | 26.6% | HICP All Items | 3.0% | 30.4% | 439,971 | 28.6% |
| Combined production of heat and electricity from geothermal sources | 175,400 | HICP Imp. of Goods and Serv., Constr. Defl. | 15.4% | 15.4% | HICP Imp. of Goods and Serv., Constr. Defl. | 5.6% | 21.8% | GDP Defl. | 3.9% | 26.6% | HICP All Items | 3.0% | 30.4% | 223,023 | 27.2% |

The impacts of recent inflation developments on the EU finances

| Investment project | RRF financing in EUR | Inflation Indicator | Inflation 2022 | Accum. Inflation so far | Inflation Indicator | Inflation 2023 | Accum. Inflation so far | Inflation Indicator | Inflation 2024 | Accum. Inflation so far | Inflation Indicator | Inflation 2025 | Accum. Inflation so far | Sum in EUR | Average Inflation |
|--|----------------------|--|----------------|-------------------------|--|----------------|-------------------------|---------------------|----------------|-------------------------|---------------------|----------------|-------------------------|------------|-------------------|
| Biodiversity | | | | | | | | | | | | | | | |
| Ecosystem approach and nature-based solutions in protection of Natura 2000 areas | 15,583 | HICP All Items | 13.0% | 13.0% | HICP All Items | 9.4% | 23.6% | HICP All Items | 3.4% | 27.8% | HICP All Items | 3.0% | 31.7% | 19,380 | 24.4% |
| Restoration of key climate ecosystems | 31,945 | HICP All Items | 13.0% | 13.0% | HICP All Items | 9.4% | 23.6% | HICP All Items | 3.4% | 27.8% | HICP All Items | 3.0% | 31.7% | 39,729 | 24.4% |
| Sustainable agriculture | | | | | | | | | | | | | | | |
| Fund for Promotion of Technological and Ecological Transition of Agriculture | 223,630 | HICP Industr. Goods and Constr. Defl. HICP Imp. of Goods and Serv. | 11.1% | 11.1% | HICP Industr. Goods and Constr. Defl. HICP Imp. of Goods and Serv. | 8.2% | 20.2% | HICP All Items | 3.4% | 24.3% | HICP All Items | 3.0% | 28.0% | 270,929 | 21.2% |
| Digitalization of the processes from farm to fork | 10,200 | HICP Industr. Goods and Constr. Defl. HICP Imp. of Goods and Serv. | 11.1% | 11.1% | HICP Industr. Goods and Constr. Defl. HICP Imp. of Goods and Serv. | 8.2% | 20.2% | HICP All Items | 3.4% | 24.3% | HICP All Items | 3.0% | 28.0% | 12,357 | 21.2% |
| Digital connectivity | | | | | | | | | | | | | | | |
| Large-scale deployment of digital infrastructure on the territory of Bulgaria | 269,589 | HICP Industr. Goods and Constr. Defl. Constr. Defl. | 14.6% | 14.6% | HICP Industr. Goods and Constr. Defl. Constr. Defl. | 7.0% | 22.5% | GDP Defl. | 3.9% | 27.3% | HICP All Items | 3.0% | 31.1% | 334,484 | 24.1% |
| Building, development and optimization of digital TETRA system and radio relay network | 63,656 | HICP Imp. of Goods and Serv. | 12.0% | 12.0% | HICP Imp. of Goods and Serv. | 6.8% | 19.5% | GDP Defl. | 3.9% | 24.2% | HICP All Items | 3.0% | 27.9% | 75,238 | 18.2% |
| Digital transformation of Bulgarian Posts and provision of complex services | 51,980 | HICP Industr. Goods and Constr. Defl. | 10.2% | 10.2% | HICP Industr. Goods and Constr. Defl. Constr. Defl. | 9.6% | 20.8% | GDP Defl. | 3.9% | 25.5% | HICP All Items | 3.0% | 29.3% | 66,208 | 27.4% |

| Investment project | RRF financing in EUR | Inflation Indicator | Inflation 2022 | Accum. Inflation so far | Inflation Indicator | Inflation 2023 | Accum. Inflation so far | Inflation Indicator | Inflation 2024 | Accum. Inflation so far | Inflation Indicator | Inflation 2025 | Accum. Inflation so far | Sum in EUR | Average Inflation |
|--|----------------------|---------------------------------|----------------|-------------------------|---------------------------------|----------------|-------------------------|---------------------|----------------|-------------------------|---------------------|----------------|-------------------------|------------|-------------------|
| Transport | | | | | | | | | | | | | | | |
| Intermodal terminal in the North Central Planning Region in Bulgaria - Ruse | 22,577 | Constr. Defl. | 18.9% | 18.9% | Constr. Defl. | 4.3% | 24.0% | GDP Defl. | 3.9% | 28.8% | HICP All Items | 3.0% | 32.7% | 28,937 | 28.2% |
| Reform of rail passenger services by purchasing new rolling stock | 340,469 | HICP Imp. of Goods and Services | 12.0% | 12.0% | HICP Imp. of Goods and Services | 6.8% | 19.5% | GDP Defl. | 3.9% | 24.2% | HICP All Items | 3.0% | 27.9% | 418,062 | 22.8% |
| Implementation of the European Train Management System (ERTMS) for on-board equipment | 32,211 | HICP Imp. of Goods and Services | 12.0% | 12.0% | HICP Imp. of Goods and Services | 6.8% | 19.5% | GDP Defl. | 3.9% | 24.2% | HICP All Items | 3.0% | 27.9% | 39,552 | 22.8% |
| Construction of Stage 3 of Line 3 of the metro in Sofia - metro station "Hadzhi Dimitar" - "Levski-G" | 111,188 | HICP All Items | 13.0% | 13.0% | HICP All Items | 9.4% | 23.6% | HICP All Items | 3.4% | 27.8% | HICP All Items | 3.0% | 31.7% | 135,312 | 21.7% |
| Digitization of the TEN-T network through the implementation of ERTMS in the railway section Ruse - Kaspichan | 105,255 | Constr. Defl. | 18.9% | 18.9% | Constr. Defl. | 4.0% | 23.7% | GDP Defl. | 3.9% | 28.5% | HICP All Items | 3.0% | 32.3% | 134,423 | 27.7% |
| Improvement of road safety by enabling sustainable road safety management | 5,113 | HICP All Items | 13.0% | 13.0% | HICP All Items | 9.4% | 23.6% | HICP All Items | 3.4% | 27.8% | HICP All Items | 3.0% | 31.7% | 6,359 | 24.4% |
| "Green Mobility" - a pilot scheme to develop ecological, safe, functional and energy-efficient transport systems | 49,574 | HICP Imp. of Goods and Services | 13.0% | 13.0% | HICP Imp. of Goods and Services | 6.8% | 20.7% | HICP All Items | 3.4% | 24.8% | HICP All Items | 3.0% | 28.5% | 61,797 | 24.7% |
| Local development | | | | | | | | | | | | | | | |
| Program for construction/reconstruction/reconstruction of water supply and sewage systems | 153,388 | Constr. Defl. | 18.9% | 18.9% | Constr. Defl. | 4.0% | 23.7% | Constr. Defl. | 3.0% | 27.4% | HICP All Items | 3.0% | 31.2% | 192,231 | 25.3% |
| Digitalization for complex management, control and efficient use of water | 57,557 | HICP Imp. of Goods and Services | 12.0% | 12.0% | HICP Imp. of Goods and Services | 6.8% | 19.5% | GDP Defl. | 3.9% | 24.2% | HICP All Items | 3.0% | 27.9% | 72,029 | 25.1% |

The impacts of recent inflation developments on the EU finances

| Investment project | RRF financing in EUR | Inflation Indicator | Inflation 2022 | Accum. Inflation so far | Inflation Indicator | Inflation 2023 | Accum. Inflation so far | Inflation Indicator | Inflation 2024 | Accum. Inflation so far | Inflation Indicator | Inflation 2025 | Accum. Inflation so far | Sum in EUR | Average Inflation |
|---|----------------------|---|----------------|-------------------------|---|----------------|-------------------------|---------------------|----------------|-------------------------|---------------------|----------------|-------------------------|------------|-------------------|
| Business environment | | | | | | | | | | | | | | | |
| Improving the quality and sustainability of security services | 41,009 | HICP All Items | 13.0% | 13.0% | HICP All Items | 9.4% | 23.6% | HICP All Items | 3.4% | 27.8% | HICP All Items | 3.0% | 31.7% | 51,002 | 24.4% |
| Upgrade the Unified Information System of Courts of Justice | 9,875 | HICP Imp. of Goods and Services | 12.0% | 12.0% | HICP Imp. of Goods and Services | 6.8% | 19.5% | GDP Defl. | 3.9% | 24.2% | HICP All Items | 3.0% | 27.9% | 12,436 | 25.9% |
| Digitalization in the system of administration of justice | 3,642 | HICP Imp. of Goods and Services | 12.0% | 12.0% | HICP Imp. of Goods and Services | 6.8% | 19.5% | GDP Defl. | 3.9% | 24.2% | HICP All Items | 3.0% | 27.9% | 4,587 | 25.9% |
| Information and communication infrastructure in the Prosecutor's Office of the Republic of Bulgaria | 14,714 | HICP Imp. of Goods and Services | 12.0% | 12.0% | HICP Imp. of Goods and Services | 6.8% | 19.5% | GDP Defl. | 3.9% | 24.2% | HICP All Items | 3.0% | 27.9% | 18,530 | 25.9% |
| Digitalizing information arrays in register data and e-certification from registers | 63,247 | HICP Imp. of Goods and Services | 12.0% | 12.0% | HICP Imp. of Goods and Services | 6.8% | 19.5% | GDP Defl. | 3.9% | 24.2% | HICP All Items | 3.0% | 27.9% | 77,258 | 22.2% |
| Methods for alternative resolution of disputes in the judicial system in Bulgaria - pilot introduction of mandatory court mediation | 826 | HICP All Items | 13.0% | 13.0% | HICP All Items | 9.4% | 23.6% | HICP All Items | 3.4% | 27.8% | HICP All Items | 3.0% | 31.7% | 1,028 | 24.4% |
| Pilot phase for introduction of construction information modelling (CIM/BIM) in construction sector | 3,983 | HICP Imp. of Goods and Services | 12.0% | 12.0% | HICP Imp. of Goods and Services | 6.8% | 19.5% | HICP All Items | 3.4% | 23.6% | HICP All Items | 3.0% | 27.3% | 4,811 | 20.8% |
| Unified information system for spatial planning, investment design and construction permitting | 1,497 | HICP Imp. of Goods and Services | 12.0% | 12.0% | HICP Imp. of Goods and Services | 6.8% | 19.5% | HICP All Items | 3.4% | 23.6% | HICP All Items | 3.0% | 27.3% | 1,808 | 20.8% |
| Instrument for a better strategic planning and strategic management | 733 | HICP Imp. of Goods and Services | 12.0% | 12.0% | HICP Imp. of Goods and Services | 6.8% | 19.5% | HICP All Items | 3.4% | 23.6% | HICP All Items | 3.0% | 27.3% | 886 | 20.8% |
| Information and administrative environment for the implementation of the RRP | 6,438 | HICP Imp. of Goods and Services | 12.0% | 12.0% | HICP Imp. of Goods and Services | 6.8% | 19.5% | HICP All Items | 3.4% | 23.6% | HICP All Items | 3.0% | 27.3% | 7,793 | 21.1% |
| Upgrading of the Center for Aerospace Observation | 56,559 | HICP Industr. Goods and Constr. Defl. Constr. Defl. | 14.6% | 14.6% | HICP Industr. Goods and Constr. Defl. Constr. Defl. | 7.0% | 22.5% | GDP Defl. | 3.9% | 27.3% | HICP All Items | 3.0% | 31.1% | 72,316 | 27.9% |

| Investment project | RRF financing in EUR | Inflation Indicator | Inflation 2022 | Accum. Inflation so far | Inflation Indicator | Inflation 2023 | Accum. Inflation so far | Inflation Indicator | Inflation 2024 | Accum. Inflation so far | Inflation Indicator | Inflation 2025 | Accum. Inflation so far | Sum in EUR | Average Inflation |
|---|----------------------|---------------------------------|----------------|-------------------------|---------------------------------|----------------|-------------------------|---------------------|----------------|-------------------------|---------------------|----------------|-------------------------|------------|-------------------|
| Social inclusion | | | | | | | | | | | | | | | |
| Modernizing long-term care | 328,877 | GDP Defl. | 15.1% | 15.1% | HICP All Items | 9.4% | 25.9% | HICP All Items | 3.4% | 30.2% | HICP All Items | 3.0% | 34.1% | 426,545 | 29.7% |
| Assisting devices to persons with permanent disabilities | 10,226 | HICP Imp. of Goods and Services | 12.0% | 12.0% | HICP Imp. of Goods and Services | 6.8% | 19.5% | HICP All Items | 3.4% | 23.6% | HICP All Items | 3.0% | 27.3% | 12,276 | 20.0% |
| Modernization of the Employment Agency | 13,612 | Constr. Defl. | 18.9% | 18.9% | Constr. Defl. | 4.0% | 23.7% | HICP All Items | 3.4% | 27.9% | HICP All Items | 3.0% | 31.7% | 17,202 | 26.4% |
| Development of the social economy | 12,320 | GDP Defl. | 15.1% | 15.1% | HICP All Items | 9.4% | 25.9% | HICP All Items | 3.4% | 30.2% | HICP All Items | 3.0% | 34.1% | 15,606 | 26.7% |
| Development of the cultural and creative sectors | 40,746 | HICP All Items | 13.0% | 13.0% | HICP All Items | 9.4% | 23.6% | HICP All Items | 3.4% | 27.8% | HICP All Items | 3.0% | 31.7% | 51,279 | 25.8% |
| Digitalisation of museum collections, libraries and archives | 30,438 | HICP Imp. of Goods and Services | 12.0% | 12.0% | HICP Imp. of Goods and Services | 6.8% | 19.5% | HICP All Items | 3.4% | 23.6% | HICP All Items | 3.0% | 27.3% | 37,527 | 23.3% |
| Modernization of the Agency for Social Assistance | 4,170 | GDP Defl. | 15.1% | 15.1% | HICP All Items | 9.4% | 25.9% | HICP All Items | 3.4% | 30.2% | HICP All Items | 3.0% | 34.1% | 5,283 | 26.7% |
| Healthcare | | | | | | | | | | | | | | | |
| Modernization of medical facilities for hospital care | 178,506 | HICP Imp. of Goods and Services | 12.0% | 12.0% | HICP Imp. of Goods and Services | 6.8% | 19.5% | HICP All Items | 3.4% | 23.6% | HICP All Items | 3.0% | 27.3% | 215,628 | 20.8% |
| Centres for interventional diagnostics and endovascular treatment of cerebrovascular diseases | 54,767 | HICP Imp. of Goods and Services | 12.0% | 12.0% | HICP Imp. of Goods and Services | 6.8% | 19.5% | HICP All Items | 3.4% | 23.6% | HICP All Items | 3.0% | 27.3% | 66,156 | 20.8% |
| Modernization of psychiatric care in Bulgaria | 12,152 | HICP Imp. of Goods and Services | 12.0% | 12.0% | HICP Imp. of Goods and Services | 6.8% | 19.5% | HICP All Items | 3.4% | 23.6% | HICP All Items | 3.0% | 27.3% | 14,680 | 20.8% |

The impacts of recent inflation developments on the EU finances

| Investment project | RRF financing in EUR | Inflation Indicator | Inflation 2022 | Accum. Inflation so far | Inflation Indicator | Inflation 2023 | Accum. Inflation so far | Inflation Indicator | Inflation 2024 | Accum. Inflation so far | Inflation Indicator | Inflation 2025 | Accum. Inflation so far | Sum in EUR | Average Inflation |
|--|----------------------|---------------------------------|----------------|-------------------------|---------------------------------|----------------|-------------------------|---------------------|----------------|-------------------------|---------------------|----------------|-------------------------|------------------|-------------------|
| Healthcare | | | | | | | | | | | | | | | |
| Construction of a system for providing emergency medical assistance by air | 50,780 | HICP Imp. of Goods and Services | 12.0% | 12.0% | HICP Imp. of Goods and Services | 6.8% | 19.5% | HICP All Items | 3.4% | 23.6% | HICP All Items | 3.0% | 27.3% | 61,341 | 20.8% |
| National digital platform for medical diagnostics | 12,050 | HICP Imp. of Goods and Services | 12.0% | 12.0% | HICP Imp. of Goods and Services | 6.8% | 19.5% | HICP All Items | 3.4% | 23.6% | HICP All Items | 3.0% | 27.3% | 14,865 | 23.4% |
| Improve the national emergency communications system 112 | 23,854 | HICP Imp. of Goods and Services | 12.0% | 12.0% | HICP Imp. of Goods and Services | 6.8% | 19.5% | HICP All Items | 3.4% | 23.6% | HICP All Items | 3.0% | 27.3% | 29,427 | 23.4% |
| Development of outpatient care | 35,857 | GDP Defl. | 15.1% | 15.1% | HICP All Items | 9.4% | 25.9% | HICP All Items | 3.4 | 30.2 | HICP All Items | 3.0% | 34.1% | 45,423 | 26.7% |
| TOTAL (CALCULATED) | 6,912,847 | | | | | | | | | | | | | 9,048,319 | 30.9% |

Source: Own compilation and calculation- Note: LEV-EUR Exchange rate is set at the fixed value as per the Bulgarian currency board of 1 EUR = 1.95583 Lev. When two inflation indicators are listed, the inflation index used is the average between the two

Annex 3 – Case study on Spain – Overview of thematic objectives and investment priorities

| Thematic objectives | Investment priorities |
|---|--|
| 01 - Strengthening research, technological development and innovation | 1a - enhancing research and innovation (R&I) infrastructure and capacities to develop R&I excellence, and promoting centres of competence, in particular those of European interest; |
| | 1b - promoting business investment in R&I, developing links and synergies between enterprises, research and development centres and the higher education sector, in particular promoting investment in product and service development, technology transfer, social innovation, eco-innovation, public service applications, demand stimulation, networking, clusters and open innovation through smart specialisation, and supporting technological and applied research, pilot lines, early product validation actions, advanced manufacturing capabilities and first production, in particular in key enabling technologies and diffusion of general purpose technologies |
| 02 - Enhancing access to, and use and quality of information and communication technologies | 2a - extending broadband deployment and the roll-out of high-speed networks and supporting the adoption of emerging technologies and networks for the digital economy |
| | 2b - developing ICT products and services, e-commerce, and enhancing demand for ICT |
| | 2c - strengthening ICT applications for e-government, e-learning, e-inclusion, e-culture and e-health |
| 03 - Enhancing the competitiveness of small and medium-sized enterprises | 3a - promoting entrepreneurship, in particular by facilitating the economic exploitation of new ideas and fostering the creation of new firms, including through business incubators |
| | 3d - supporting the capacity of SMEs to grow in regional, national and international markets, and to engage in innovation processes |
| 04 - Supporting the shift towards a low-carbon economy | 4a - promoting the production and distribution of energy derived from renewable sources |
| | 4b - promoting energy efficiency and renewable energy use in enterprises |
| | 4c - supporting energy efficiency, smart energy management and renewable energy use in public infrastructure, including in public buildings, and in the housing sector |
| | 4e - promoting low-carbon strategies for all types of territories, in particular for urban areas, including the |

| | |
|--|--|
| | promotion of sustainable multimodal urban mobility and mitigation-relevant adaptation measures |
| | 4f - promoting research and innovation in, and adoption of, low-carbon technologies |
| 06 - Preserving and protecting the environment and promoting resource efficiency | 6b - investing in the water sector to meet the requirements of the Union's environmental acquis and to address needs, identified by the Member States, for investment that goes beyond those requirements |
| | 6c - conserving, protecting, promoting and developing natural and cultural heritage |
| | 6e - taking action to improve the urban environment, to revitalise cities, regenerate and decontaminate brownfield sites (including conversion areas), reduce air pollution and promote noise-reduction measures |
| 07 - Promoting sustainable transport and removing bottlenecks in key network infrastructures | 7a - supporting a multimodal Single European Transport Area by investing in the TEN-T |
| | 7b - enhancing regional mobility by connecting secondary and tertiary nodes to TEN-T infrastructure, including multimodal nodes |
| | 7d - developing and rehabilitating comprehensive, high quality and interoperable railway systems, and promoting noise-reduction measures |
| 09 - Promoting social inclusion, combating poverty and any discrimination | 9b - supporting employment-friendly growth through the development of endogenous potential as part of a territorial strategy for specific areas, including the conversion of declining industrial regions and enhancement of accessibility to, and development of, specific natural and cultural resources |

Source: Own, based on the Multiregional Operational Programme of Spain 2014-2020, version 5.2, https://www.fondoseuropeos.hacienda.gob.es/sitios/dgfc/es-ES/ipr/fcp1420/p/Prog_Op_Plurirregionales/Documents/PO_Plurirregional_de_Espana_Decision.pdf

The focus of this study is the effect of inflation on the ongoing implementation of the current MFF on an aggregate level. The relevant inflation impacts and the channels via which they take effect are presented and analysed for the MFF and the EU revenue system. The study then maps and discusses policy options to mitigate these effects regarding the ongoing MFF and NGEU implementation, as well as with a view to the ongoing MFF mid-term revision.

PE 756.629

Print

ISBN 978-92-848-1394-0 | doi:10.2861/011676 | QA-05-23-423-EN-C

PDF

ISBN 978-92-848-1393-3 | doi:10.2861/884633 | QA-05-23-423-EN-N