1. INCORPORATING THE NEXTGENERATIONEU IN THE DSA FRAMEWORK

As of this round, the DSA accounts for the impact of NGEU (NextGenerationEU) investment. *The latter, notably via its Recovery and Resilience Facility (RRF) component, will affect national government debt significantly over the medium term via a number of channels, including by fostering economic growth and via favourable financing cost effects. The expected favourable impact of structural reform efforts under the RRF however remains beyond the scope of the DSA framework.*

The impact of NGEU investment is reflected in the DSA framework as follows: *first, the Commission's short-term economic forecast accounts for the NGEU impact, thus providing a starting point for the medium-term debt projections that reflects this impact. Then, methodological adjustments were made to adequately factor-in the impact of NGEU investment beyond 2023 (i.e. beyond the forecast horizon). In particular, the standard 'T+10' medium-term GDP growth projections, usually used in the Commission's DSA, have been adjusted, on the basis of Commission's Quest estimations, to reflect the NGEU investment profile of each country beyond 2023 – i.e. the portion of the NGEU funds still to be absorbed beyond the forecast in each country.*

The incorporation of the effect of NGEU investment in the DSA relies on a set of stylised assumptions*. These notably relate to the degree of 'additionality' of NGEU-financed measures and on the quality of investment. Monitoring of the RRF implementation will allow sharpening those assumptions over time. Importantly, RRF-induced structural reforms, which have the potential to substantially boost GDP growth, have not been reflected in the estimates given inherent difficulties of such exercise. Last, the overall NGEU investment impact is not directly computable because of the difficulty to proxy a counterfactual without NGEU. A comparison of the pre-NGEU GDP growth with the current GDP growth projections that underpin the Commission's DSA sheds some light on this issue but provides only an imperfect proxy of this impact.*

The COVID-19 outbreak and the forceful policy response are highly relevant developments from a DSA perspective. The crisis caused sharp recessions and some temporary financing tensions in some EU Member States, resulting in a temporary deterioration of the interest-growth rate differential (see Part II, Chapter 3). These developments and the necessary supportive fiscal policies caused an increase of governments' fiscal deficit and debt, with heterogeneous effects across countries. Alongside national policies, EU-level policies, of an unprecedented scale, were put into place, including in particular NextGenerationEU (NGEU), the EU recovery plan. These policies aimed not only at cushioning the impact of the crisis, but also at accelerating the green and digital transition, strengthening economic and social resilience and fostering convergence among the EU.

The DSA framework is well-suited to reflect those developments. The Commission short-term economic forecast, which reflects those developments, serves as the starting point for the DSA debt projections. Moreover, forward-looking information, notably contained in financial indicators (i.e. forward interest and inflation rates), are used in the projections. Yet, properly accounting for the unprecedented scale of the EU-level policy response, notably NGEU, over the medium-term calls for some adjustments of the DSA assumptions.

As of this round, the DSA accounts for the impact of NGEU, including the investments under the Recovery and Resilience Facility (RRF), on GDP growth ([105]), ([106]). For that purpose, the regular 'T+10' GDP projections usually used in the Commission's DSA have been adjusted to factor-in the NGEU payments beyond

([105]) This also ensure consistency with the Commission's economic forecast. Details on how the Commission Economic forecast fully accounts for the NGEU is provided in Box I.5.1 of the Autumn 2021 forecast report.

([106]) On the other hand, the GDP projections used in the DSA do not take into account the expected favourable impact of structural reforms under the RRF, an aspect admittedly difficult to quantify.

2023, on the basis of Commission's Quest simulations ([107]).

The rest of this thematic chapter is organised as follows. First, the chapter recalls key features of the NGEU (section 1.1) and the channels through which it is expected to affect debt developments (section 1.2). Then, it describes the methodology developed to reflect it in the DSA framework (section 1.3). Some comparisons of GDP growth projections before and after the inclusion of NGEU investments are also provided (section 1.4).

1.1. NGEU FROM A DSA PERSPECTIVE

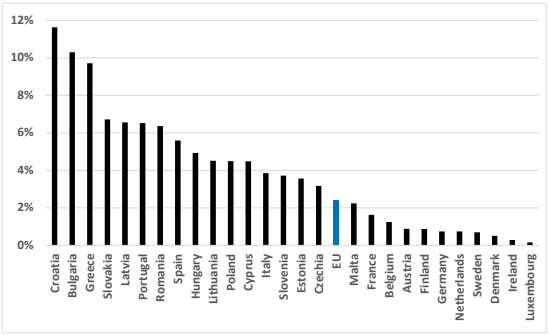
This section recalls the key features of NGEU (section 1.1.1) and the channels through which it is expected to affect government debt developments (section 1.1.2) ([108]).

1.1.1. Key features

Among the policy responses deployed to cushion the COVID-19 crisis impact, NGEU stands out as an unprecedented concerted effort at the EU level. It amounts to EUR 750 billion (in 2018 prices) over the years 2021-2026. The NGEU centrepiece, the Recovery and Resilience Facility (RRF) ([109]), is financed by a temporary increase in the EU's budget (the multiannual financial framework, 2021-2027) ([110]). The RRF accounts for almost 90% of the NGEU package, and is composed of both grants (EUR 312.5 billion) and loans (up to EUR 360 billion) ([111]).

The RRF notably aims at accelerating the green and digital transition, strengthening economic and social resilience and fostering economic convergence in the aftermath of the COVID-19 crisis. Economies with a high rate of (pre-crisis) unemployment and that suffered a deep negative impact of the crisis will receive a relatively large amount of grants ([112]). Such asymmetric support is relevant from a debt sustainability perspective, as countries more economically vulnerable tend to face more fiscal sustainability risks (see Graph II.1.1).

Graph II.1.1: **RRF grants per Member State (% of pre-crisis country GDP 2019)**



(1) RRF grant allocation as indicatively based on the European Commission's 2020 Autumn Forecast.
Source: Commission services.

The RRF is also a performance-based instrument, providing financing for identified investments and reform efforts. Payments under this facility are conditioned to the achievement of agreed milestones and targets, related to specific investments and reforms, as spelled-out in the Recovery and Resilience Plans (RRPs). Importantly, this set-up strengthens incentives to invest and implement major economic, social and

([107]) The regular T+10 GDP projections are the official medium-term GDP projections, computed using the EU Commonly Agreed Methodology (EUCAM).
([108]) See Afman et al. (2021).
([109]) The RRF was proposed by the EC on 27 May 2020. On 21 July 2020 the European Council reached a political agreement on NGEU (and the 2021-2027 long-term EU budget) and by December 2020 a final agreement was reached with the European Parliament on the RRF.
([110]) The NGEU also includes: the Recovery Assistance for Cohesion and the Territories of Europe (REACT-EU) initiative, which adds EUR 47.5 billion support over 2021-2022 to extend crisis response/repair measures, disbursed via the European Regional Development Fund (ERDF), the European Social Fund (ESF), the European Fund for Aid to the Most Deprived (FEAD), and EUR 30 billion of support via further European programmes or funds such as Horizon2020, InvestEU, rural development or the Just Transition Fund (JTF).
([111]) The respective RRF amounts in current prices are EUR 338 billion for grants and EUR 385.8 for loans.
([112]) For the RRF, 70% of the total amount of support Member States are entitled to is allocated on the basis of the Member States' unemployment record from 2015-2019, inverse GDP per capita and population share. For the remaining 30% of the total envelope, the impact of the crisis is taken into account based on the drop in real GDP in 2020 and, in equal proportion, the cumulative loss in real GDP over 2020 and 2021. For details see Annex I-III of the RRF Regulation (https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32021R0241&qid=1613983930651&from=EN).

environmental reforms. The strengthening of institutional capacities, via reforms, complements and increases the effectiveness of investments, setting in motion favourable self-reinforcing dynamics.

The RRF is well underway. The Council adopted, on 13 July 2021, implementing decisions on the RRPs of Austria, Belgium, Denmark, France, Germany, Greece, Italy, Latvia, Luxembourg, Portugal, Slovakia and Spain. On 28 July 2021, Croatia, Cyprus, Lithuania and Slovenia also received approval for their plans, while on 8 September 2021, the Council adopted Czechia's and Ireland's plans, on 5 October Malta's plans and on 29 October the plans of Romania, Finland and Estonia. Hence, as of 10 December 2021, 26 EU Member States (all but the Netherlands) had submitted their RRPs, 22 plans were adopted by the Council, while 4 (BG, HU, PL and SE) were still being assessed by the Commission. Seven countries have also requested loans on top of the grant allocation (Greece, Italy, Poland, Portugal, Slovenia, Cyprus and Romania). Italy, Greece and Romania have requested the maximum loan allocation (IT: EUR 122.6 billion; EL: EUR 12.7 billion RO: EUR 14.9 billion), whereas Poland, Portugal, Slovenia and Cyprus requested less than the maximum.

To finance NGEU, the European Commission, on behalf of the EU, borrows on the capital markets. EU's high credit rating, which allows the Commission to borrow at favourable financial conditions, is an advantage that will be passed on to the EU Member States directly, when providing them loans, or indirectly via the EU budget, overall fostering lower interest rate payments on borrowing to finance recovery and resilience spending. The financing will be concentrated between mid-2021 and 2026, corresponding to the RRF life span. Loans will be repaid by the borrowing Member State and grants via the EU budget, while in connection with the repayment of the latter, the Commission proposes new 'own resources' to the EU budget. All funds raised by the EU in relation to the RRF will be repaid by 2058.

1.2. DEBT IMPACT CHANNELS

NGEU represents a multi-year fiscal impulse synchronised across EU Member States, whose impact on national government debt in the medium term will depend on a number of factors and channels ([113]). Those channels include direct effects on public finances and indirect effects, via the fostering of economic growth and favourable financing cost effects. The nature and size of these effects will depend on certain aspects such as the degree of 'additionality' of measures financed by NGEU, the 'quality' of the investment it finances and the use of loans or grants to finance these measures ([114]). Timing mismatches between the release and use of earmarked funds may also (temporarily) affect debt developments. In the description of the channels, we focus on the RRF, as it features both grants and loans and fosters investment and structural reforms, aspects that are all important to highlight the various channels.

1.2.1. Direct impact channel

Three sources of direct NGEU impact on the amount of public debt can be distinguished. They relate to whether or not the measures financed by NGEU fund are fully 'additional' or not, whether some measure are financed through (RRF) loans and whether there is some timing mismatch between the release and the use of funds.

RRF grants represent additional source of public revenue for national governments to finance investments and support reform efforts set out in their RRPs. Under the statistical principle of budgetary neutrality ([115]), grants from the RRF will be recorded at the time when the expenditure funded by the RRF occurs, thereby 'neutralising' the impact of any leads or lags in the

([113]) See also Box 5.1: "The implications of the RRF for debt sustainability: some first elements", in *The 2020 Debt Sustainability Report*.

([114]) Additionality here refers to the fact that NGEU funds would serve to finance measures that would otherwise not have been considered. Instead, in the regulation, additionality implies that RRF funds do not substitute for recurring national expenditures nor for other EU funds (see RRF regulation (final compromise text) recital 10a, art. 4a and art. 8).

([115]) See Eurostat's guidance: https://ec.europa.eu/eurostat/documents/1015035/11337978/Draft_guidance_note_on_the_statistical_recording_of_the_recovery_and_resilience_facility.pdf

cash payments. However, if RRF grants are used to finance measures that would exist in a counterfactual scenario without the RRF, then the budget balance (and also government debt) would directly be improved by comparison to that counterfactual.

The (RRF) loan component could also directly affect government debt. If the RRF loans are used to finance 'additional' expenditure, the stock of government debt will increase. Importantly, the increase in debt via this channel would however be mitigated to the extent that the government benefits from more favourable financing conditions to engage such measures than with market financing. By contrast, if the RRF loan is used to finance spending that would have taken place without the RRF – i.e. in case of no additionality – then, a *favourable* impact on debt, through lower interest expenditure, is expected.

Direct impacts on government debt can also arise due to timing mismatches between the disbursement and use of NGEU funds. While in ESA 2010, the budget balance is recorded in accrual terms ([116]), government debt is directly affected by cash flows. Therefore, the direct impact of NGEU funds on government debt will depend on their disbursement profile with respect to the timing of related outflows. For instance, if grant-funded expenditures take place before the release of funds, the government will have to issue (short-term) debt to finance this additional spending. In case of (full) additionality, such issuance will add – at least temporarily – to the debt burden ([117]). Yet, such a potential impact should be short-lived and contained.

1.2.2. Indirect impact channel

The main indirect NGEU impact on debt would relate to its favourable GDP growth impact. The additional expenditure will not only boost aggregate demand during the implementation period (up until 2026), it is also expected to increase potential growth over the medium term, to some extent, especially if this expenditure increases the physical and human capital. Favourable spillover effects are also expected to reinforce favourable economic effects. According to the Commission QUEST model simulations, described in Box II.1.2, the impact of NGEU investment on EU GDP growth will be significant ([118]) and remain positive over the medium term (with a still positive impact in 2032, i.e. beyond the implementation period). Moreover, as stressed above, structural reforms are expected to amplify these positive effects.

The size and persistence of these effects on GDP growth will however depend on a number of aspects. First, the impact of the NGEU-financed measures will depend on the degree of 'additionality' of these measures. The higher the 'additionality', the larger the incremental impact on economic activity, notably as crowding-out effects, stemming from potentially adverse effects on financing conditions, should be limited at the current juncture. In addition, public investment has the potential to crowd in private investment in some activities. Potential import-leakages are also mitigated by the fact that the NGEU is a coordinated common EU-wide fiscal expansion. As regards the persistence of economic effects – i.e. the impact of NGEU on potential growth – it will depend on the quality of reforms and investment projects fostered by NGEU ([119]). The fact that NGEU contributes to cushioning the effect of the economic crisis – i.e. dampening persistent adverse impacts that would otherwise possibly materialise (i.e. so-called hysteresis effects) – also contributes to the favourable indirect NGEU effect on debt, via fostering a more favourable economic outlook.

QUEST-based results, discussed in Box II.1.2**, point at sizeable and persistent positive impacts of NGEU investment on EU's economic activity and on convergence across the EU ([120]).** Such protracted positive impact on growth is expected to improve significantly debt dynamics over the medium term. In addition to providing a fiscal impulse, the medium term structural reform efforts

([116]) This means that revenue and expenditure – including interest payments – are recorded when they are incurred, regardless of when the money is actually received or paid.

([117]) As the budget balance (in accrual terms) will not be affected, these amounts will be recorded in stock-flow adjustments.

([118]) Real GDP in the EU is estimated to be up to 1.3% higher during the years of the NGEU's active operation, compared to a no-policy change baseline, see Box II.1.1.

([119]) In the literature, the average output elasticity of public capital is estimated at around of 0.12 (see Bom and Lighthart, 2014).

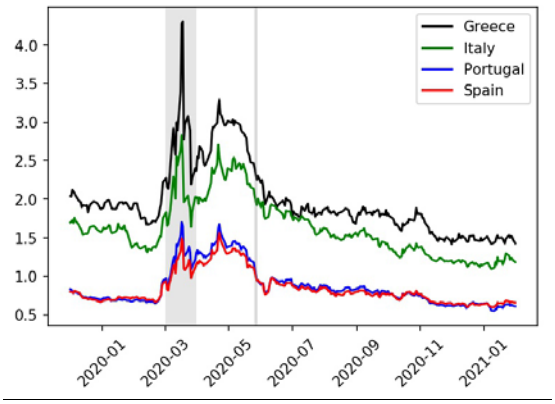
([120]) See Pfeiffer et al. (2021) for details.

induced by the RRF could provide substantial additional (supply-side) support over the medium-term horizon, e.g. by boosting growth via increased labour market participation, enhanced allocative efficiency and improved business environment.

Positive spillovers represent an important aspect of the indirect NGEU impact. Importantly, it ensures that even economies with smaller grant allocations are also expected to benefit from NGEU, given significant cross-country spillovers in the highly integrated EU economy. Such positive spillovers should contribute to fostering economic activity in those countries and result from the fact that the NGEU is an EU-wide policy.

The adoption of the NGEU package – combined with other policy actions – also contributes to generate indirect benefits by reducing risk premia. This already materialised through a reduction in government financing costs, following NGEU's announcement (see **Graph** II.1.2**).** Such confidence effects should persist, also contributing to stimulate consumer and investment spending, thereby further boosting the indirect GDP channel. Finally, given its long maturity, the NGEU package also contributes to an overall lengthening of average debt maturity across the EU, further insulating Member States' financing costs from short-term fluctuations and thereby reducing rollover risks.

Graph II.1.2: **10 year government bond yields against German bonds**



(1) Shaded areas highlight the COVID-19 outbreak (March 2020) and the NGEU proposal by the European Commission release (27 May 2020).
Source: Bloomberg

1.3. NGEU INCORPORATION IN THE DSA

By its size and nature, the NGEU package is set to have significant implications for the analysis of debt sustainability. As NGEU mitigates the impact of the crisis, fosters convergence across the EU and supports stronger and more resilient recovery, via investment, reforms and positive spillovers, it affects the macroeconomic and fiscal outlook of those countries.

The NGEU impact is reflected in the Commission DSA. First, as the Commission's short-term economic forecast accounts for the NGEU impact, it provides a starting point for the debt projections that reflects this impact. The use of market-based indicators to set projection targets for (inflation and) interest rates also ensures that the anticipated NGEU impact on the developments of those variables is reflected in the DSA. Importantly, this ensures that the impact of NGEU (and other policies) on risk premia developments is accounted for in the DSA.

Beyond these effects, methodological adjustments have been made in this report to adequately factor-in the impact of NGEU investment beyond 2023. Such adjustment primarily relates to ensuring that projected debt developments properly account for the implementation of the NGEU investment beyond the forecast horizon. Several aspects matter in this respect. In particular, the regular 'T+10' medium-term GDP growth projections, usually used in the Commission's DSA, ([121]) have been adjusted to reflect the spending profile beyond 2023. This adjustment, particularly important for countries that either strongly front-loaded (or back-loaded) NGEU implementation, relies on the use of specific QUEST simulations devised for the DSA purpose as explained in Box II.1.1. The remainder of this section presents these various methodological aspects in detail.

([121]) The official 'T+10' medium-term GDP growth projections are estimated by DG ECFIN, using the European Union's Commonly Agreed Methodology (EUCAM), agreed by the Economic Policy Committee's Output Gap Working Group and the EPC. For details on this methodology see Havik et al. (2014).

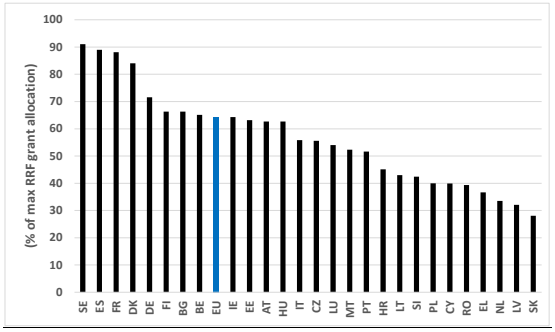
1.3.1. NGEU impact in the forecast

In the DSA, attempt is made to factor-in the expected NGEU implementation profile. The DSA takes the Commission short-term forecast as the starting point of the projections. Beyond the short-term forecast horizon, only the remainder portion of the NGEU investment package, assumed not to have been spent by 2023, is considered for each country.

The forecast accounts for the (RRF-financed) measures incorporated in the RRPs as submitted to the Commission ([122]). The cash disbursement are commensurate to the progress in the achievement and the time profile of milestones and targets as specified in the Plans (and – if adopted – the relevant Council Implementing Decisions) ([123]). The inclusion of transfers from the EU in revenue projections and the time profiles of cash disbursements included in the forecast is based on the assumption of a timely completion of milestones and targets. Any expenditure or other costs financed with RRF grants is neutralised in revenue forecasts by matching transfers received from the EU ([124]).

The Autumn 2021 forecast figures point at a total RRF grants absorption at EU level by 2023 of around 65% of the total RRF financing, while in unweighted terms the average absorption is 55%. This indicates significant front-loading of the use of RRF grants across Member States, according to the assessment embedded in the Commission forecast, especially among larger countries (Graph II.1.3). Among the large Member States, the forecast for France and Spain assumes such significant frontloading of RRF grant financed expenditures (close to 90% of their total RRF grant allocation would be absorbed by 2023), while Germany and Italy would have spent around 70% and 55% of their RRF grant allocation by 2023, respectively. In terms of composition of expenditure, the highest allocation of the EU's RRF funding by 2023 goes to capital transfers (44%), predominantly supporting private investment, followed by general government investment (32%) while the remainder would finance other spending. The forecast also incorporates growth effects linked to the RRF, with RRF-financed investments and accompanying structural reforms expected to push productivity growth to a strong pace of 2.9% next year and 1.6% in 2023, although such quantification is assessed to be surrounded by uncertainty, notably with the role of structural reforms remaining difficult to assess and reflect in the forecast ([125]).

Graph II.1.3: **Absorption of RRF grants up to 2023 (% of total allocation)**



(1) Based on Autumn 2021 Commission Economic forecast.
(2) The graph reports the EU weighted average.
(3) For the EU unweighted average the value is 55%.
Source: Commission services.

1.3.2. NGEU impact included in the DSA beyond the forecast

Building on the Commission short-term forecast, the DSA projections beyond 2023 factors-in the impact expected from the implementation of the remainder of the NGEU funds. In particular, the different degrees of NGEU implementation (i.e. front- versus back-loading) across countries, are reflected in the medium-term projections.

The GDP medium-term projections are based on specific additionality assumptions. Consistently with the standard stylised assumptions retained in the QUEST model, the following assumptions are retained ([126]):

([122]) See Box I.5.1: Some technical elements behind the forecast in the Autumn 2021 Commission Economic Forecast report.
([123]) In cases where the RRP was not yet endorsed by a Council Implementing Decision, the incorporation of the RRP in the forecast rests on the working assumption of a positive assessment by the Commission and future endorsement by a Council Implementing Decision.
([124]) Hence, transactions related to the RRF in the forecast are recorded in line with Eurostat's 'Guidance note on the statistical recording of the Recovery and Resilience Facility' of 7 October 2021.

([125]) See Autumn 2021 Commission Economic Forecast report.
([126]) The adjusted GDP medium-term projections are based on specific QUEST simulations devised for the DSA purpose,

1. We assume full 'additionality' of (remaining) grants and 50% 'additionality' of (remaining) loans.

2. We assume that remaining funds are released linearly over the period 2024-2026 ([127]).

3. We assume that remaining NGEU financed (investment) measures are linearly enacted over the period 2024-2026.

NGEU direct impact

The direct impact of NGEU investment on debt should be limited for most countries. This reflects the fact that grants, which represent the bulk of NGEU in most countries and which are meant to finance 'additional' measures, have a budget neutral impact. As discussed, RRF loans are assumed to be only partially additional, limiting their direct impact on the budgetary balance and debt. Moreover, the impact on the budget of 'additional' measures financed by loans are expected to be partly offset by favourable cost of financing effects ([128]).

NGEU indirect impact

To account for the NGEU impact on growth a new methodology has been developed, relying on adjusted medium-term GDP growth paths compared with the regular 'T+10' projections (see Box II.1.1**).** This adjustment allows accounting for the effect of NGEU disbursements beyond the forecast horizon, and in particular, for different implementation paces across countries (i.e. the degree of front- versus back-loading).

The regular 'T+10' GDP growth estimates tend to imply only a gradual waning of the NGEU investment reflected in the forecast over time. Yet, countries featuring strong front-loading (back-loading) would witness a sharp deceleration (acceleration) of NGEU investment in 2024-2026 (i.e. the remaining NGEU implementation years, beyond the forecast horizon).

1.4. GDP GROWTH PROJECTIONS BEFORE AND AFTER THE INCLUSION OF NGEU INVESTMENTS

The overall NGEU impact is not directly computable in the DSA framework because of the difficulty to proxy a counterfactual without NGEU. Specifically, this relates to the fact that the Commission DSA builds on the short-term forecast, which reflects part of the NGEU impact (up to 2023), while not reporting the magnitude of that impact, for each country.

To gauge the NGEU impact, we compare the current GDP projections with pre-NGEU GDP projections reported in the Debt Sustainability Monitor (DSM) 2020. This provides only a proxy of the NGEU impact. Yet the DSM 2020 is a relevant benchmark as it already incorporated the impact of the COVID-19 crisis but not yet any impact of NGEU investment, including in the short-term forecast ([129]).

Comparing potential GDP figures underpinning the current DSA with those that underpinned the DSM 2020 points at a significant and long-lasting NGEU impact (Graph II.1.4**).** The top panel shows that potential growth is higher once accounting for NGEU investment in all years, except in 2027 when the programme ends, corresponding to a sharp drop in investment intensity that year. The bottom panel illustrates the long-lasting impact on the potential GDP level.

Interpretation of such comparison however warrants caution. The incorporation of the

as explained in Box II.1.2). These simulations are built around the same principles as the Quest simulations run for the assessment of the Recovery and Resilience Plans (see Box II.1.1).

([127]) Note that the standard stylized QUEST assumptions assume a linear NGEU implementation profile over the period 2021-2026 (see Box II.1.1). This assumptions is however amended here when using QUEST to adjust the T+10 medium-run GDP projections, to account for the NGEU, with the QUEST assumption accounting for the portion of NGEU implementation already reflected in the forecast in that case (see Box II.1.2). It is this second QUEST assumption for the NGEU implementation which is relevant here, in the context of incorporating NGEU in the DSA framework.

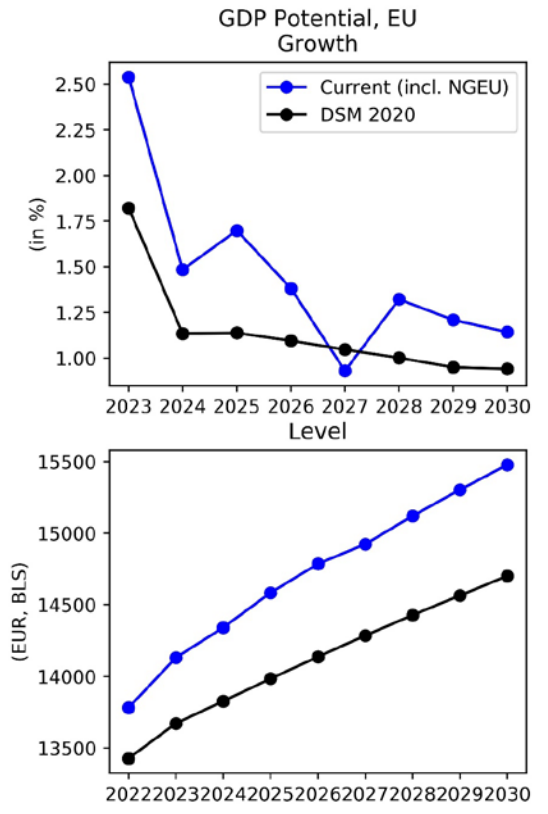
([128]) Moreover, for the few Member States that requested RRF loans, such loans are to be lent on to the private sector in some countries, thus being budget neutral.

([129]) For details on this see Box 5.1 entitled: "The implications of the RRF for debt sustainability: some first elements", in the 2020 Debt Sustainability Monitor and Box I.4.3 entitled: "The inclusion of Next Generation EU and its Recovery and Resilience Facility in the forecast", in the Commission 2020 autumn forecast Report.

NGEU impact is not the sole driver of difference across these vintages. Indeed, such comparisons are also affected by revisions to the assessment of the impact of the crisis.

In terms of impact on national debts, stylised QUEST simulations pointed at close to 5 pps of GDP debt-reducing effect for the EU as a whole, by 2032 (see Box II.1.2**).** This magnitude is relevant in the context of the DSA as incorporation of NGEU impact builds on the use of such QUEST simulations, adapted to account for the NGEU implementation profile assumed under the forecast, as explained in this section.

Graph II.1.4: **Potential GDP compared to the previous report**



Source: Commission services.

Box II.1.1: NGEU adjusted T+10 medium term GDP growth estimates

A variant of the regular 'T+10' medium-term GDP estimates has been constructed which tries to account for the NGEU implementation pace reported in the forecast for each country ([1]). These adjusted 'T+10' medium-term GDP estimates rely on the use of QUEST simulations similar to those described in Box II.1.2 but tailored for the purpose of adjusting the 'T+10' medium-term GDP estimates. Specifically, the steps to adjust the 'T+10' medium-term GDP paths are as follows ([2]):

1. A QUEST-based simulation estimates the impact on GDP of implementing the NGEU embedded in the forecast, for each country. This is used to estimate the carry-over effect that is implicitly reflected in the (unadjusted) regular 'T+10' GDP paths, given the (implicit) assumption of persistence effects on investment in the years beyond the forecast horizon, when relying on the standard 'T+10' method.

2. A second QUEST-based simulation is run using the remainder of the NGEU funds to be implemented beyond the forecast horizon, for each country. This estimate aims at providing the effect on GDP that the NGEU implementation would yield beyond the forecast horizon.

3. The difference between (2) and (1) is the adjustment that is applied to the regular 'T+10' GDP paths to help account for the NGEU implementation profile in each country, i.e. the degree of front- or back-loading embedded in the forecast and the corresponding pick up or deceleration of NGEU investments beyond the forecast.

Graph 1 **shows the regular and the adjusted 'T+10' medium-term GDP level paths, for the EU and Latvia, to illustrate to impact of the adjustment.** It shows that for the EU as a whole, the medium-term GDP level paths are broadly similar and consequently the regular T+10 projections, which draw on ECFIN's desk officer forecasts up to 2023, are in line with the model simulations at the aggregate EU level. This implies that at aggregate levels the persistent NGEU impact embedded in the regular 'T+10' medium-term GDP level paths adequately accounts for the remaining NGEU effects beyond the forecast horizon. This conclusion does not however apply to some countries, due to large differences in the timing of the disbursement of NGEU funds over the total period up to 2026. For example, if a country features strong NGEU implementation back-loading, such as Latvia (deemed to have implemented 30% of its NGEU package by 2023), the paths can differ. In that case, the adjusted 'T+10' medium-term estimate accounts for an acceleration of NGEU-induced investments beyond the forecast horizon (2024-2026), causing a sharp increase in GDP growth in 2024. Overall, this causes a permanent increase of the (relative) GDP level over the projection horizon (2024-2032). An opposite (though contained) effect occurs for countries featuring NGEU implementation front-loading under the adjusted 'T+10' medium-term GDP paths.

Graph 1 **also shows an abrupt decline in the GDP level for the adjusted T+10 path, coinciding with sharp changes in the NGEU implementation pace.** Year 2027 shows a kink in all cases as it coincides with the end of NGEU-induced investments. As such, GDP growth tends to decelerate that year. This effect is especially strong in countries that were still implementing a significant part of their NGEU investments in 2026, namely countries such as Latvia, which had back-loaded their NGEU implementation. In contrast, countries that had front-loaded their NGEU implementation, such as Spain, witness a milder deceleration in 2027, as by 2026 their implementation was already milder. Instead, those countries tend to witness a sharp drop in NGEU induced investments in 2024 and a corresponding drop in growth that year, reflecting the sharp change in the NGEU implementation pace beyond the forecast horizon.

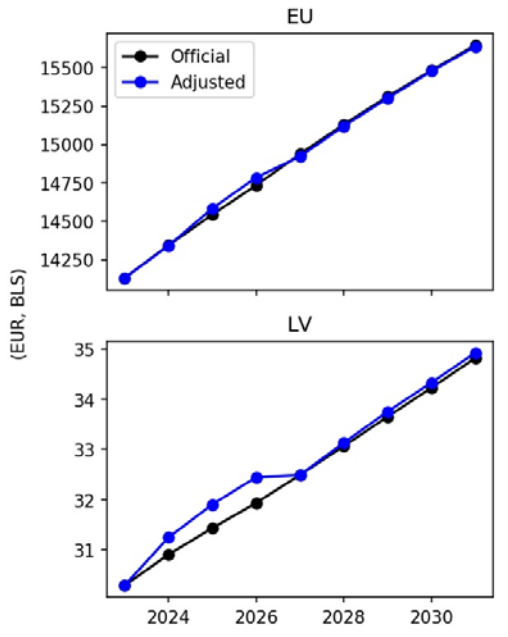
([1]) The regular T+10 GDP projections are the official medium-term GDP projections, computed using the EU Commonly Agreed Methodology (EUCAM).

([2]) The adjustment of the standard 'T+10' GDP paths is spilt across the potential output and the output gap, preserving a smooth path for potential output.

(Continued on the next page)

Box (continued)

Graph 1: **NGEU-adjusted medium-term GDP level path, for the EU and Latvia**



(1) The regular medium-term GDP level paths are those estimated by DG ECFIN, using the European Union's Commonly Agreed Methodology (EUCAM), agreed by the Economic Policy Committee's Output Gap Working Group and the EPC. For details on this methodology, see Havik et al. (2014).

(2) The NGEU-adjusted medium-term GDP level paths account for the differentiated NGEU implementation pace across countries, reported in the Commission forecast, as explained in this Box.

Source: Commission services

Box II.1.2: NGEU impact in a stylised QUEST-based simulation

Simulations based on the Commission's QUEST model provide a stylised quantitative assessment of NGEU's macroeconomic impact ([1]). These simulations incorporate key features of the NGEU, namely the allocation of EU grants to Member States, access to (RRF) loan at favourable conditions and new issuance of debt by the EU with repayment assumptions. The multi-country structure of the model also accounts for spillover effects.

These simulations rely on a number of stylised assumptions regarding NGEU implementation: (i) They consider a total package amounting around 4% of EU GDP with EUR 396 billion in grants with country allocation following largely the RRF allocation key ([2]). (ii) The simulations account for EUR 166 billion in RRF loans, based on requests by seven Member States (as of July 2021) ([3]). (iii) The analysis considers two stylised (linear) implementation profiles, a four-year "fast" scenario (2021-2024) and a six-year scenario (2021-2016). (iv) 100% 'additionality' is assumed for NGEU grants and 50% 'additionality' for RRF loans ([4]). By assuming full 'additionality' of grants and no timing mismatch between the release and the use of funds the direct NGEU impact on public finances plays a limited role in those stylised simulations, reflecting only the 50% additionality of RRF loans (contracted by a limited set of seven countries), considered only for a limited set of countries. (v) The productivity of investment assumption is in line with the literature ([5]). (vi) All Member States repay the EU level debt from 2027 to 2058 based on current GDP shares ([6]). Member States receiving RRF loans repay them from 2031 to 2050 ([7]).

Importantly, this QUEST-based assessment concentrates on the fiscal stimulus alone and does not factor in the positive impact of **structural reforms** on potential growth, which is expected to boost GDP further and in a permanent way ([8]). The simulations also do not take into account **reductions in risk premia or positive confidence effects**, which could further increase the growth effects of NGEU.

Stylised growth impact

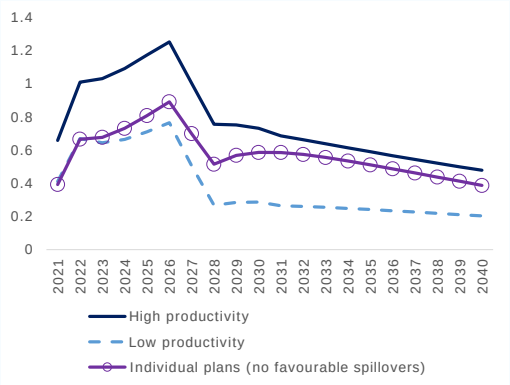
The stylised QUEST-based simulations point at a substantial growth effects of NGEU investments (see Graph 1). For a six-year NGEU scenario, with evenly distributed spending between 2021 and 2026, the level of annual real GDP in the EU would peak around 1.3% higher than it would have without NGEU investments by 2026. As public capital is productive, the additional investment boosts aggregate demand *and* increases potential growth. The latter supply-side effects last beyond the implementation phase and can lead to high long-term cumulative multiplier effects. Even in 20 years' time, EU GDP could be around 0.5% higher than it would have been without NGEU. **Despite differences in the modelling approach, these results are broadly in line with those of other models,** notably an ECB analysis based on the EAGLE model finding that NGEU could increase real GDP in the euro area by around 1.5% over the medium term ([9]).

([1]) See Pfeiffer et al. (2021) and Afman et al. (2021).
([2]) The amount refers to 2019 prices. Besides the RRF grants, the total NGEU grant volume includes other instruments such as ReactEU and the Just Transition Fund (JTF). The allocation across Member States follows the current RRF maximum grant allocation. For ReactEU and the Just Transition Fund, we apply the specific allocation key based on current information. For the other instruments (Horizon Europe, InvestEU, Rural Development, RescEU), we applied the 70%-RRF allocation key.
([3]) The RRF loan volume, based on current information (July 2021), is expected to increase as several Member States have indicated that they intend to apply for a loan at a later stage.
([4]) In the simulations, non-additional loans finance general spending (which would take place anyway) but are repaid in full (i.e. they are not financed via new national debt), thereby reducing the debt burden eventually.
([5]) The main scenarios calibrate the output elasticity of public capital based on a meta-study (0.12). The sensitivity analysis also looks at a lower productivity scenario. See, Bom, P., and Ligthart, J. (2014).
([6]) QUEST simulations also keep track of EU debt which will need to be reimbured by EU's 'own resources' (Graph 3).
([7]) All repayments follow a linear schedule and are based on lump-sum contributions.
([8]) On this, see Varga, J., and in 't Veld, J. (2014).
([9]) See, Bańkowski et al. (2021).

(Continued on the next page)

Box (continued)

Graph 1: **NGEU GDP impact in QUEST, EU aggregate**

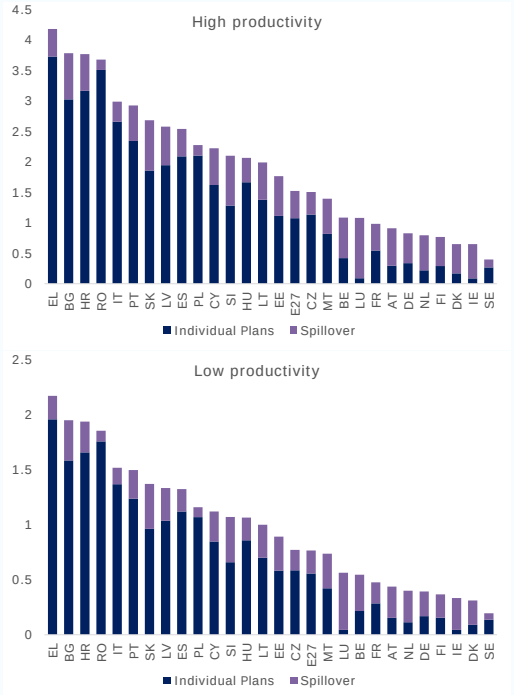


(1) This graph reports the NGEU impact on level of real GDP in per cent deviation from a no-NGEU baseline assuming.

(2) The dark purple line (with circles) shows the results if NGEU plans were enacted unilaterally, implying less favourable spillover effects across the EU and export leakages for each country, while still assuming high productivity of investment.
Source: Pfeiffer et al. (2021).

The simulations also highlight important positive spillover effects (see Graph 1 and 2). Simultaneous investment thus increases the effectiveness of this policy. Open economies with smaller grant allocation benefit significantly via the positive spillover channel. According to the modelling, spillover effects could account for around one third of the growth on average. Simply aggregating the individual effects of Member States' plans would thus substantially underestimate the macro effects of the NGEU (see the breakdown in Graphs 2), confirming that all countries benefit from a positive NGEU impact on GDP.

Graph 2: **NGEU GDP impact in QUEST, EU countries**



(1) The graph shows peak effects on real GDP in 2024 expressed in per-cent deviation from a no-policy change baseline for a fast NGEU profile spanning 2021 to 2024 under the assumption of high or low productivity. The dark bars show simulation results for a standalone investment stimulus in each Member State (NGEU). The spillover (light bars) is defined as the difference between the coordinated simultaneous NGEU stimulus in all Member States and the standalone simulations of national plans.
Source: Pfeiffer et al. (2021).

Stylised debt impact

The stylised simulations point at a significant debt reducing effect (see Graph I.13, solid lines). The debt impact shows a small kink when the NGEU spending phase ends (in 2027, for the six-year scenario) but debt remains on a downward path beyond the NGEU implementation phase.([10]) The model also tracks the impact on total debt, including EU level NGEU related debt (see Graph I.13, dashed lines), which Member States repay from 2027 to 2058, based on current GDP shares in those simulations.

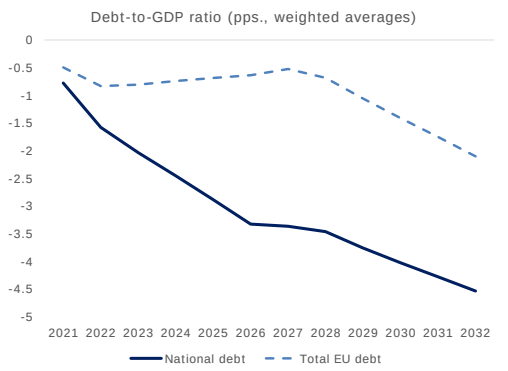
([10]) The assumed interest-rate growth differential matters for the long-run debt trajectory. All scenarios assume a (real) steady-state growth rate of 1.7% and a long-run real interest rate for government bonds of 0% (both in annual terms).

(Continued on the next page)

Box (continued)

The stylised simulations also highlight the sensitivity of the results to key assumptions. Aside from considering the faster (4-year) and the slower (6-year) pace of implementation, notably to provide evidence on the impact of delaying implementation (e.g. by not reaching milestones and targets), results flag the impact of a less effective use of NGEU funds, via assuming the financing of less productive investment, yielding milder growth effects (Graph 1) ([11]).

Graph 3: **NGEU debt impact in QUEST, EU aggregate**



(1) This graph reports the QUEST-based NGEU impact on debt-to-GDP ratios in percentage point deviation from a no-NGEU baseline. The solid (dashed) lines show the average debt ratios abstracting from EU debt (explicitly including EU debt used for grant financing). Note that these stylised model-based debt projections differ from the Commission's Debt Sustainability Assessment, which follows a different methodology.
Source: Pfeiffer et al. (2021) and Commission services.

([11]) See also the details in Pfeiffer et al. (2021).