

Macroeconomic and fiscal effects of the draft National Recovery and Resilience Plan

Report to the Secretary of State for Recovery and
Strategic Investments

April 2021

Federal Planning Bureau

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Abstract - The National Recovery and Resilience Plan details the use of the €5.925 billion allocated under the Recovery and Resilience Facility. The major part (88%) of the Belgian plan is directly intended to increase the capital stock of the Belgian economy through public investment and aid to private investment. In the short term, at the peak of the plan's stimulus effect, economic activity would be 0.2% higher than in the non-plan scenario. Although the stimulus is temporary, it has long-term effects due to the increase in the public capital stock and the support for R&D activities that improve the profitability of the capital stock of firms and encourage its accumulation. By 2040, GDP is still projected to be 0.1% above non-plan growth path. This estimate does not take into account the reform component of the plan, nor the broader recovery, investment and reform plans announced by the Regions and the federal government, nor the effect of foreign plans on the Belgian economy.

Jel Classification - E27, E62, H5

Keywords - Economic recovery, Public investment, Macroeconomic simulation

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Executive summary

The European Union is making €5.925 billion available to Belgium over the 2021-2026 period under the NextGenerationEU Recovery and Resilience Facility. In order to benefit from this, Belgium has drawn up a plan which includes a few hundred investment projects along with reform projects. The plan is organised into thematic axes entitled "climate, sustainability and innovation", "digital transformation", "mobility", "social inclusion and community" and "economy of the future and productivity". Only the investment component is taken into account in this quantitative analysis; reforms without a fiscal impulse have not been taken into account in the simulations.

Upon examination, it emerges that a major part of the €5.925 billion, i.e. 88%, is actually being used to increase the capital stock of the Belgian economy. Of this 88%, two thirds will be invested in tangible fixed assets, including - but not limited to - construction and civil engineering. One third will be invested in intangible fixed assets, almost half of which will be invested in R&D. Of this 88%, more than half will be the result of direct government investment with the remaining investments coming from the business sector and, to a lesser extent, households and NPIs, financed by the government with the European grant.

Investment increases economic activity in the short term by stimulating aggregate demand, and in the long term by increasing aggregate supply.

At the peak of the stimulus effect, economic activity (GDP) would be 0.2% higher than in the non-plan scenario. The additional volume of work would correspond to almost 4,000 jobs, taking into account a positive effect on productivity. The maximum stimulus effect would be achieved in the plan's second year according to its indicative implementation schedule. The recovery is somewhat diminished by the fact that some of the investment is import driven. The recovery has a positive impact on public finances; by 2026, government debt would be reduced by 0.5% of GDP compared to a non-plan scenario.

The plan's stimulus effects are reinforced by supply effects: the increase in public capital stock and the encouragement of R&D activities improve the profitability of the capital stock of firms, stimulating its accumulation. In 2030, GDP is projected to be 0.2% above the non-plan growth path as labour productivity and the external competitiveness of the economy improve. This positive effect gradually fades over the following ten years. In 2040, the effect on GDP is 0.1%, corresponding to the creation of 1,000 jobs and a reduction of almost 1% in the debt expressed as a percentage of GDP.

These effects on GDP, employment and public finances may seem modest, but it is important to remember that the reform component is not included in the quantitative assessment and that the European grant of €5.925 billion represents only 0.2% of GDP over the 2021-2026 period. Public and private co-financing from own resources could be added to this. In addition, broader recovery, investment and reform plans announced by the Regions and the federal government could multiply the impact of the European €5.925 billion. Finally, other countries will benefit from the European Recovery and Resilience Facility, sometimes to a much greater extent than Belgium, and large countries outside Europe are also embarking on recovery programmes. As a small open economy, Belgium could benefit significantly through its exports.

1. Introduction

The Federal Planning Bureau (FPB) has been asked by the Secretary of State for Recovery and Strategic Investments to estimate the short-, medium- and long-term macroeconomic and fiscal effects of the proposed Recovery and Resilience Plan (RRP).

This will be financed by grants from the European Union's budget, specifically from the Recovery and Resilience Facility (RRF). The RRF is the centrepiece of the NextGenerationEU programme, a temporary instrument that allows the European Commission to raise funds to help repair the economic and social damage caused by Covid-19 by supporting the reforms and investments undertaken by Member States. These funds will be raised by the European Union's budget on the financial markets until 2026 at the latest and repaid between 2027 and 2058. The impact of these repayments on Belgium's contributions to the European budget is not taken into account in this study, especially as new own resources for the European budget currently under consideration could avoid a call for direct contributions from Member States to repay the loans.

The RRF grant for Belgium has been set at €5.925 billion over the 2021-2026 period, which is 0.2% of GDP for these six years.

The RRP comprises a few hundred investment projects grouped into components, which are in turn grouped into thematic axes: 1) Climate, sustainability and innovation, 2) Digital transformation, 3) Mobility and public works, 4) Social inclusion and community, 5) Economy of the future and productivity. This investment component is accompanied by a reform component which provides for a series of administrative and regulatory support measures and reforms in various socio-economic areas, the practical details of which are yet to be specified. The reform component (defined here as all measures that do not involve budgetary expenditure¹) is not part of the scope of the quantitative evaluation in this study.

The staff of the Secretary of State for Economic Recovery and Strategic Investments provided the FPB with information on the projects in the RRP's investment component. The FPB's analysis is based on information received as of 7 April 2021.²

A number of projects will combine the RRF grant with contributions from the government or private companies from their own resources. As the details of these arrangements are still to be specified, it was agreed with the Secretary of State's staff that the scope of this study would be limited to public expenditure financed by the RRF grants. Furthermore, this study does not take into account the broader recovery, investment and reform plans announced by the Regions and the federal government, nor the plans of other countries.

Investment increases economic activity in the short term by stimulating aggregate demand and in the long term by increasing aggregate supply. The appropriate FPB models for running simulations in this regard are HERMES for the short to medium term and QUEST for the long term. These are

¹ Measures identified as "reforms" in the RRP but which involve budgetary expenditure and therefore a call on RRF grants are included in the quantitative assessment in this study.

² This corresponds to the Interim Draft of the RRP of 2 April 2021.

macroeconomic models, implying a relatively stylised approach to the matter at hand. The analysis is not therefore based on a "tailored" study of each individual investment project in its microeconomic specifics, but on an analysis at the aggregate level of the different dissemination channels of the macroeconomic effects activated by the RRP investment projects.

Section 2 quantifies the RRP investments by year and by thematic axis and then translates this quantification into a relevant breakdown for macroeconomic analysis, namely by economic category of expenditure according to the ESA, the accounting system on which the statistical series used by the aforementioned models are based.

Section 3 describes the method used to estimate the short- to medium-term effects and presents its results. The evaluation with the HERMES model - a demand model - focuses specifically on the "stimulus" effect of the RRP, i.e. the rise in economic output in response to the increase in aggregate demand corresponding to the RRP investments. The evaluation does not address the specific productivity of the new capital stock resulting from the RRP investments, which reflects longer-term supply effects. Similarly, possible changes in inter-industry and inter-sectoral relationships arising from the plan are not reflected in the short- to medium-term results, for example a possible reduction in imports as a result of the development of the circular economy promoted by some projects. Other specific spillover effects, such as the reduction in energy consumption resulting from energy retrofit projects, or the budget savings that would result from spending reviews, are also not evaluated.

Section 4 describes the method used to estimate the long-term effects and presents its results. The evaluation with the QUEST III R&D model - a dynamic general equilibrium model - is used to identify the supply effects of the RRP and in particular, the effects on the capital stock of private firms, in addition to the stimulus effects through aggregate demand. The RRP investments lead to an increase in public capital stock and R&D stock, both of which positively influence the profitability of the private sector capital stock, encouraging its accumulation. This explains the persistence of the RRP's effects, although its budgetary stimulus is only temporary. Productivity and external competitiveness improve progressively over the period analysed and the inflationary effect of the stimulus is transformed into a fall in prices as the supply effects materialise. Like HERMES, the QUEST model does not take into account changes in the structure of the economy resulting from the plan or specific spillover effects.

Appendix 1 provides a breakdown of RRP investments according to the Classification of the Functions of Government (COFOG).

Appendix 2 shows the RRP investment tables by economic category of expenditure for each axis.

Appendix 3 identifies those reforms from the RRP whose effects could have been assessed by the QUEST III R&D model if the necessary information had been available.

2. Information used to estimate macroeconomic and fiscal effects

The compilation of the information that was sent to the FPB by the staff of the Secretary of State for Recovery and Strategic Investments (by the deadline of 7 April 2021) results in Table 1 which presents indicative public expenditure of the RRP by axis and component. The figures in this table include non-recoverable VAT paid on government purchases³ of capital and other goods and services.

After deduction of this VAT, the grand total of the table is 5.925 billion, i.e. the amount of the RRF grant to Belgium. The annual grants of the RRF correspond to the year's expenditure in accordance with Eurostat's Draft Guidance Note on the Statistical Recording of the RRF of 17 November 2020.⁴

Table 1 The RRP by axis and component
In millions of euros unless otherwise stated

	2021	2022	2023	2024	2025	2026	2021-2026	2021-2026 (% du total)
Climate, Sustainability and Innovation	249	487	427	440	300	230	2133	33
Renovation of Buildings	165	276	171	223	144	145	1124	18
Emerging energy technologies	48	107	133	144	110	66	608	9
Climate & Environment	36	104	123	74	46	18	401	6
Digital Transformation	140	258	212	150	80	38	877	14
Cybersecurity	19	20	17	19	12	5	91	1
Public administration	118	201	170	107	55	21	672	10
Optic fibre, 5G & New technology	3	37	25	25	13	11	114	2
Mobility and Public Works	310	263	235	307	249	50	1414	22
Cycling and walking infrastructure	33	50	120	139	154	9	505	8
Greening road transport	32	70	36	57	12	2	210	3
Modal shift	244	143	79	110	83	39	699	11
Social inclusion and Community	263	316	136	115	80	18	928	14
Education 2.0	251	211	19	18	17	0	515	8
Training and Empl. for Vulnerable Groups	11	76	52	42	5	0	185	3
Social Infrastructure	1	29	66	55	58	18	227	4
Economy of the future and Productivity	109	352	247	190	100	50	1049	16
Supporting economic activity	53	156	141	63	21	9	442	7
Training and labour market	35	125	60	95	65	28	408	6
Circular economy	22	72	46	32	14	13	199	3
Public finance	5	3	3	0	0	0	10	0
Spending reviews	5	3	3	0	0	0	10	0
Total	1076	1680	1259	1203	809	385	6411	100
RRF grant	998	1577	1169	1102	732	347	5925	
Non-recoverable VAT	78	103	90	101	76	38	486	
Total (% du PIB)	0.23	0.34	0.24	0.23	0.15	0.07	0.21	

The HERMES and QUEST models are based on statistical series from the national accounts. Therefore, for the purpose of the simulations, it was necessary to compile the RRP expenditure not by axis and component, but by its economic category according to the ESA. To this end, project proponents (through the staff of the Secretary of State for Recovery and Strategic Investments) were asked to detail their planned annual expenditure according to a closed list of economic categories relevant to the RRP philosophy.

³ More specifically: by units belonging to the general government sector according to the ESA which are not subject to VAT with the right of deduction.

⁴ <https://ec.europa.eu/eurostat/web/government-finance-statistics/methodology/guidance-on-accounting-rules>

After compiling the information obtained, correcting obvious errors and adding missing data, we obtain the indicative breakdown by economic category presented in Table 2.

Table 2 The RRP by economic category of expenditure
In millions of euros unless otherwise stated

	2021	2022	2023	2024	2025	2026	2021-2026	2021-2026 (% du total)
Acquisitions of fixed assets	634	772	656	676	477	242	3457	54
Computer and telecommunication equipment	239	195	53	45	29	21	582	9
Transport equipment and other machinery and equipment	34	71	35	60	12	3	215	3
Buildings and civil engineering works	186	286	388	472	386	197	1915	30
R&D, software, databases and other intellect. property rights	176	220	181	99	49	20	745	12
Grants to corporations for investment	172	479	388	364	259	127	1789	28
Computer and telecommunication equipment	2	51	10	9	8	4	84	1
Transport equipment and other machinery and equipment	2	24	29	27	23	7	111	2
Buildings and civil engineering works	111	178	199	215	161	93	955	15
R&D, software, databases and other intellect. property rights	58	226	151	112	68	23	638	10
Other	270	429	214	163	73	16	1165	18
Grants to households and NPI's for investment	137	168	48	37	13	2	405	6
Acquisition of non-financial non-produced assets	15	45	49	29	15	5	157	2
Subsidies on production and current transfers	12	46	22	20	10	2	112	2
Purchase of non-durable goods and services	77	116	82	63	26	6	369	6
Remuneration of public sector employees	29	54	14	14	10	1	121	2
Total	1076	1680	1259	1203	809	385	6411	100
RRF grant	998	1577	1169	1102	732	347	5925	
Non-recoverable VAT	78	103	90	101	76	38	486	
Total (% du PIB)	0.23	0.34	0.24	0.23	0.15	0.07	0.21	

Gross fixed capital formation is broken down according to the institutional sector acquiring fixed assets: general government itself, the business sector (financed by capital transfers received from general government, which are themselves financed by the RRF) and the household and NPI sector (also financed by capital transfers from general government financed by the RRF).

Investments are also broken down into a number of categories of tangible and intangible fixed assets. Depending on their category, the production of these investment goods makes different demands on imports and on domestic production industries, which themselves differ in terms of their labour intensity, capital intensity and the intensity and origin of their intermediate consumption. To some extent, the HERMES model takes these features into account allowing for a more refined estimation of the macroeconomic and fiscal effects of the RRF. The QUEST model distinguishes R&D investments from investments in other fixed asset categories, since R&D investments have a specific impact on potential growth.

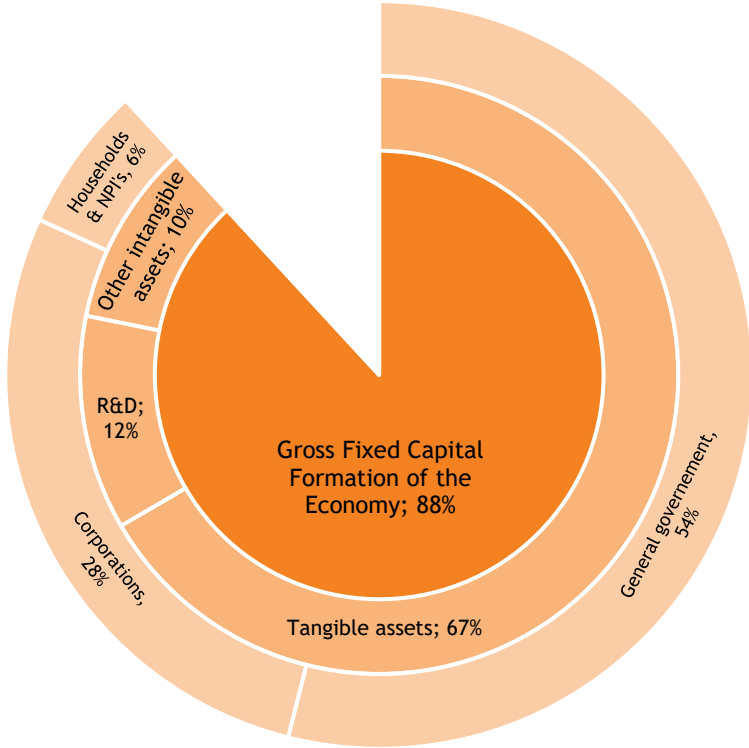
Figure 1 summarises the data in Table 2 to show the RRF's contribution to the growth of the capital stock of the economy.

It can be seen that a very large share of the RRF - 88% of the total expenditure - is intended for the gross fixed capital formation of the economy. Of this 88%, two thirds will be invested in tangible fixed assets (much of it in construction and civil engineering, but also in other asset categories), and one third in intangible fixed assets (almost half of it in R&D). Of this 88%, more than half is the result of direct government investment, with the remainder the result of business sector investments (financed by capital transfers received from the government and in turn financed by the RRF) and, to a lesser extent, household and NPI investments. It should be noted that gross fixed capital formation in the

"construction and civil engineering works" asset category accounts for a large share of the investments: based on Table 2 and assuming that most of the investment aid to households is for construction), it is estimated to account for some six-tenths of the 88% of the RRP allocated to increasing the capital stock of the economy, or about half of the RRP as a whole.

Figure 1 Share of RRP allocated to increasing the capital stock of the economy

As a % of total RRP expenditure over the 2021-2026 period



3. Short- and medium-term effects

3.1. Method

3.1.1. HERMES model

The HERMES macroeconometric model is the FPB's central tool for medium-term macroeconomic projections and short- and medium-term policy analyses.⁵ In this study, HERMES was used to calculate the short- and medium-term impacts of the RRP's investment component on the macroeconomy and public finances. The baseline scenario used for this impact assessment is the medium-term projection published by the FPB in February 2021.⁶

HERMES is aligned with the most recent national accounts. The model is characterised by a high degree of disaggregation. It singles out 15 industries⁷ and 23 consumer products. Five main institutional sectors of the national accounts are represented in the model with a high level of disaggregation of general government reflecting the Belgian institutional framework.

Production in each industry is determined by the demand addressed to it. To ensure this production, each industry determines its optimal demand for production factors (labour, capital, energy and other intermediate consumption) based on their relative prices. More specifically regarding the capital factor, gross fixed capital formation of each industry is subdivided into seven investment products.⁸ Coherence between demand and production is ensured using input-output tables.

The nature of the model implies that economic activity is primarily demand-driven and that production adjusts accordingly. Technological progress is assumed to be exogenous. As a result, government measures do not affect total factor productivity (unlike in the QUEST III R&D model, see section 4). This predominance of demand constrains the time horizon over which the model can relevantly be used to the short and medium term, i.e. five to six years.

⁵ A full description of the HERMES model and how it works can be found in:

- BASSILIÈRE, D., BAUDEWYNS, D., BOSSIER, F., BRACKE, I., LEBRUN, I., STOCKMAN, P. and WILLEMÉ, P. (2013), *A new version of the HERMES model*, Working Paper 13-13, Federal Planning Bureau,

https://www.plan.be/publications/publication-1274-en-a_new_version_of_the_hermes_model_hermes_iii

- BASSILIÈRE, D., DOBBELAERE, L., VANHOREBEEK, F. (2018), *Le fonctionnement du modèle HERMES - Description à l'aide de variantes, De werking van het HERMES-model - Een beschrijving aan de hand van varianten*, Working Paper 10-18, Federal Planning Bureau,

<https://www.plan.be/publications/publication-1822-en->

- BASSILIÈRE, D., DOBBELAERE, L., LEBRUN, I., VANHOREBEEK, F. (2018), *Description et utilisation du modèle HERMES, Beschrijving en gebruik van het HERMES-model*, Working Paper 1 DC2019, Federal Planning Bureau,

<https://www.plan.be/publications/publication-1847-en->

⁶ FEDERAL PLANNING BUREAU (2021), *Perspectives économiques 2021-2026 – Version de février 2021, Economische Vooruitzichten 2021-2026 – Versie van februari 2021*,

<https://www.plan.be/publications/publication-2094-en->

⁷ Agriculture; energy; intermediate goods; capital goods; consumer goods; construction; transport and communication (including land, water and air transport, ancillary transport and communication services); trade and hospitality; credit and insurance; health and social care; other market services; public administration and education; other non-market services.

⁸ Cultivated biological resources; computer and telecommunication equipment, other machinery and equipment; transport equipment; housing; other construction and civil engineering works; software, databases and other intellectual property rights; research and development.

Labour supply is also exogenous and does therefore not respond to economic policy measures. This characteristic leads to the assumption that any increase in labour demand, possibly mitigated by the upward pressure on wage it generates,⁹ can be met by existing supply. However, since the model does not distinguish between different types of qualifications or professions, no specific labour market shortages can be identified.

Finally, according to the ESA logic that accounts for investment expenditure at the time of its production (approximate time of delivery), the production of new investment products takes place in the same year as the expenditure that finances them, since this expenditure is formulated in ESA concepts in Table 2.

3.1.2. Transmission channels of investment effects

A very large part of the RRP materialises in increased government capital spending, which either leads to higher government investment or to capital transfers to the private sector, which then increases its own investment.

Both public and private investment are a component of GDP from an expenditure perspective. An increase in investment therefore has a direct impact on GDP. It is also reflected in an increase in GDP from the production perspective through the demand expressed to the industries to produce these additional investment goods and in an increase in GDP from the income perspective, which records the compensation of labour and capital used to produce the investment goods in question.

However, the increase in domestic demand is not only due to investments. Indeed, job creation and wage growth increase the disposable income of households, which has a positive impact on their expenditure (consumption and housing investment). In addition, the increase in activity stimulates business investment. The initial stimulus therefore fuels a multiplier effect.

The increase in aggregate demand leads to a slight upward pressure on prices due to wage pressures and higher capacity utilisation rates. It also leads to a deterioration in the balance of current transactions with the rest of the world, due to higher imports.

In terms of public finances, in the case of the RRP, the increase in government capital expenditure is financed by a transfer from the rest of the world, in this case the RRF grants. In addition, the following (main) indirect effects on public finances are expected: an increase in index-linked public revenue and expenditure due to the rise in prices, an increase in tax revenues as a result of the upswing in economic activity, an increase in social security contributions and a fall in unemployment costs as a result of job creation.

An increase in investment, whether initiated by the public or private sector, has different macroeconomic and sectoral effects depending on the asset category to which it relates. The HERMES model distinguishes seven asset categories (or investment products). The production of each of these investment products has its own effects, insofar as it makes greater use of certain industries than others, the

⁹ Wages are endogenous and guided by a logic of free negotiation. The simulated measures may therefore have an impact on gross hourly wages before indexation. The cost of labour and consequently gross wages depend on a number of macroeconomic determinants (productivity, unemployment rate and (para)taxation), which may be influenced by the measures.

industries in demand being more or less labour- or capital intensive and have a higher or lower import content. For example, the industries involved in the construction of new buildings are not the same as those involved in the development of new software.

3.2. Results

3.2.1. Overall effects

At the peak of the recovery process, the impact of the RRP on Belgian GDP in volume terms amounts to +0.21% compared to the baseline scenario and to +0.14% on average over the entire 2021-2026 period. Based on the technical assumption of unchanged working hours, the number of new jobs amounts to 3,900 (+0.08%) at the peak of the recovery and 2,300 (+0.05%) on average over the entire 2021-2026 period (see Table 3). The increase in economic activity therefore translates partly into an increase in employment but also partly into an increase in productivity per person (+0.13% in 2022, +0.09% on average over the entire 2021-2026 period).

Table 3 Short- and medium-term macroeconomic effects
Differences in % (unless otherwise indicated) from the baseline scenario

	2021	2022	2023	2024	2025	2026	2021-2026 ¹
GDP (real)	0.13	0.21	0.16	0.15	0.11	0.07	0.14
Private consumption	0.04	0.06	0.05	0.06	0.05	0.04	0.05
Public consumption	0.08	0.18	0.17	0.19	0.19	0.19	0.17
Gross fixed capital formation	0.97	1.39	1.04	0.98	0.66	0.32	0.89
Companies	0.42	0.87	0.67	0.61	0.42	0.20	0.53
General government	4.55	5.62	4.34	4.32	3.04	1.48	3.89
Housing	0.56	0.71	0.28	0.23	0.13	0.06	0.33
Exports	-0.00	-0.00	-0.00	-0.01	-0.01	-0.01	-0.01
Imports	0.18	0.27	0.20	0.19	0.14	0.08	0.18
Private consumption deflator	0.01	0.01	0.03	0.06	0.07	0.09	0.05
GDP deflator	0.02	0.03	0.05	0.09	0.11	0.12	0.07
Unit labour cost (market sectors)	-0.04	-0.04	0.05	0.12	0.15	0.17	0.07
Nominal hourly labour cost	0.05	0.08	0.13	0.20	0.19	0.18	0.14
Hourly productivity	0.09	0.12	0.08	0.07	0.04	0.01	0.07
Real household disposable income	0.08	0.12	0.09	0.08	0.05	0.02	0.07
Balance of current transactions with the rest of the world (% of GDP)	-0.14	-0.21	-0.16	-0.16	-0.11	-0.06	-0.14
Gross value added (in volume)	0.13	0.20	0.15	0.14	0.10	0.06	0.13
Industry ²	0.11	0.15	0.09	0.06	0.03	-0.01	0.07
Construction	0.50	0.71	0.67	0.71	0.52	0.26	0.56
Market services	0.11	0.17	0.12	0.10	0.06	0.03	0.10
Non-market services	0.08	0.19	0.16	0.19	0.20	0.19	0.17
Employment	0.05	0.08	0.06	0.05	0.03	0.02	0.05
Industry ²	0.03	0.04	0.02	-0.00	-0.02	-0.02	0.01
Construction	0.19	0.32	0.35	0.38	0.35	0.26	0.31
Market services	0.03	0.06	0.05	0.03	0.02	0.01	0.03
Non-market services	0.05	0.09	0.02	0.02	0.02	0.00	0.03
Employment (in thousands)	2.2	3.9	2.8	2.4	1.7	0.9	2.3

¹ Arithmetic mean for the 2021-2026 period.

² Defined here as the sum of the energy, capital goods, intermediate goods and consumer goods industries.

The rise in domestic demand due to the RRP also leads to an increase in imports. These import leakages limit the positive impact on GDP and consequently, the fiscal multiplier¹⁰ turns out to be less than 1. As a reminder, this impact on Belgian GDP corresponds solely to the effect of the Belgian RRP financed by

¹⁰ The fiscal multiplier measures the impact of a change in government expenditure or revenue on economic activity. In practical terms, the ex-post increase in real GDP is compared with the ex-ante impact on the public balance.

the RRF. This study does not include the other elements of the federal and regional recovery plans, nor the recovery plans of other European countries. For a small open economy like Belgium, the effects of the latter could be very significant.

The RRP has a slight inflationary effect that originates from the recovery in activity and the fact that it leads to an increase in employment and a decrease in unemployment that pushes up wages slightly.

At the sectoral level, the measure is mainly beneficial for value added and employment in the construction sector, as a relatively large share of the RRP is related to the construction or renovation of buildings or housing. The impact, expressed in relative terms, is comparatively more limited for the manufacturing industry and market services.

It should be noted that while the increase in employment in the construction industry does not appear to be large enough to create a bottleneck, the situation could be different in certain specific segments of this industry.

The simulation results indicate a slight improvement of government net lending compared to the baseline scenario. This positive effect is due to the payback effects, as the RRP is neutral ex ante for the government budget because its expenditure is financed from the RRF grants.

Table 4 Short- and medium-term effects on public finances
Differences in millions of euros (unless otherwise stated) compared to the baseline scenario

	2021	2022	2023	2024	2025	2026
Revenue	1341	2103	1631	1647	1212	729
Direct household taxes	70	111	111	140	125	105
Direct corporate taxes	70	96	43	23	3	-12
Other direct taxes	2	3	3	3	3	3
Indirect taxes	137	198	171	199	171	123
Capital taxes	0	0	-1	1	-0	-1
Social security contributions	54	104	118	152	145	129
Transfers from the rest of the world	998	1577	1169	1102	733	348
Other revenue	11	14	17	28	32	34
Expenditure	1078	1689	1322	1349	1012	633
Remuneration	35	62	33	52	60	62
Intermediate consumption and taxes	78	117	87	75	41	24
Unemployment benefits	-19	-38	-27	-21	-13	-3
Other social expenditure	7	18	38	75	108	131
Subsidies	18	57	36	39	29	22
Gross fixed capital formation	635	775	663	690	491	257
Capital transfers	309	647	436	403	275	132
Other primary expenditure	15	46	51	33	18	7
Interest payments	1	4	5	4	2	2
Net lending	263	414	309	298	200	96
Net lending (% of GDP)	0.07	0.09	0.07	0.07	0.05	0.03
Debt	-263	-677	-986	-1284	-1484	-1579
Debt (% of GDP)	-0.23	-0.40	-0.44	-0.53	-0.54	-0.51

The increase in economic activity and in the wage bill favours revenue, particularly revenue from direct household taxes and from social security contributions. Indirect taxes are also raised because of increased household expenditures (in addition to the direct effect of non-recoverable VAT on government purchases of the RRP). In terms of expenditure, the feedback effects mainly consist of a slight fall in unemployment benefits as a result of the rise in employment. It should also be noted that both indexed

government revenue and expenditure increase as a result of the slight inflationary pressure generated by the RRP.

In 2026, government debt would be 1.6 billion euros lower than in the baseline scenario, which - combined with the rise in nominal GDP - corresponds to a fall of half a percent of GDP (see Table 4). This does not lead to a decrease in interest payments, as interest rates in the baseline scenario are initially slightly negative.

3.2.2. Effects by axis

The effects of the different axes of the RRP on GDP, employment and general government net lending are shown in Tables 5, 6 and 7. Logically, these effects are greater the more the axis corresponds to a substantial fiscal impulse (see the tables in Appendix 2). Other factors also play a role, but to a lesser extent. The effect on employment is therefore greater when the investment projects making up an axis involve industries that are more labour-intensive than capital-intensive.

Axis 1 is the one which, on average over the 2021-2026 period, generates the greatest impact, both on GDP and employment and on the general government balance. This is followed by axis 3 and, finally and quite similarly, by axes 2, 4 and 5.

Table 5 Short- and medium-term effects on real GDP by axis
In % difference from baseline

	2021	2022	2023	2024	2025	2026	2021-2026 ¹
Axis 1 - Climate, Sustainability and Innovation	0.03	0.06	0.05	0.05	0.04	0.03	0.04
Axis 2 - Digital Transformation	0.02	0.03	0.03	0.02	0.01	0.01	0.02
Axis 3 - Mobility and Public Works	0.04	0.04	0.03	0.04	0.04	0.02	0.04
Axis 4 - Social inclusion and Community	0.03	0.04	0.02	0.02	0.01	0.01	0.02
Axis 5 - Economy of the future and Productivity	0.01	0.04	0.03	0.02	0.01	0.01	0.02
Total	0.13	0.21	0.16	0.15	0.11	0.07	0.14

¹ Arithmetic mean for the 2021-2026 period.

Table 6 Short- and medium-term effects on employment by axis
In % difference from baseline

	2021	2022	2023	2024	2025	2026	2021-2026 ¹
Axis 1 - Climate, Sustainability and Innovation	0.01	0.02	0.02	0.02	0.01	0.01	0.02
Axis 2 - Digital Transformation	0.01	0.01	0.01	0.01	0.00	0.00	0.01
Axis 3 - Mobility and Public Works	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Axis 4 - Social inclusion and Community	0.01	0.02	0.01	0.00	0.00	0.00	0.01
Axis 5 - Economy of the future and Productivity	0.00	0.01	0.01	0.01	0.00	0.00	0.01
Total	0.05	0.08	0.06	0.05	0.03	0.02	0.05

¹ Arithmetic mean for the 2021-2026 period.

Table 7 Short- and medium-term effects on government net lending by axis
In % difference of GDP from baseline

	2021	2022	2023	2024	2025	2026	2021-2026 ¹
Axis 1 - Climate, Sustainability and Innovation	0.02	0.03	0.02	0.02	0.02	0.01	0.02
Axis 2 - Digital Transformation	0.01	0.01	0.01	0.01	0.00	0.00	0.01
Axis 3 - Mobility and Public Works	0.02	0.02	0.02	0.02	0.02	0.01	0.02
Axis 4 - Social inclusion and Community	0.01	0.02	0.01	0.01	0.01	0.00	0.01
Axis 5 - Economy of the future and Productivity	0.01	0.02	0.01	0.01	0.01	0.00	0.01
Total	0.07	0.09	0.07	0.07	0.05	0.03	0.06

¹ Arithmetic mean for the 2021-2026 period.

4. Long-term effects

4.1. Method

To simulate the long-term effects, the FPB used the dynamic general equilibrium model QUEST III R&D, developed by the DG ECFIN of the European Commission. In the following, the general properties of this type of model are first presented. Next, some specific features of the QUEST¹¹ model are discussed. Finally, the way in which the RRP measures in particular were simulated, is detailed.

4.1.1. Dynamic general equilibrium

The modelling strategy starts with the observation that in many markets imbalances between supply and demand are eliminated by the price mechanism, as epitomized by Adam Smith's "invisible hand", and applies this to the idea that there is a (single) set of prices ensuring that all markets in the economy are in equilibrium. In this framework, supply and demand, and thus the general equilibrium, can be deduced from the structural characteristics of the actors and the institutional framework, such as the state of production technology and the preferences of households and governments. The dynamic component comes from the fact that actors do not only make decisions in the here and now, but consider the future consequences of their choices too, for example, in savings and investment decisions. In the modelling, these intertemporal choices are also deduced from structural determinants, such as the "impatience" of households (i.e., the extent to which they value their current consumption more than their future consumption), the long-term growth of the economy and the rate of depreciation of capital goods. This not only allows the reforms to be evaluated statically but also to simulate the transition path to the new equilibrium.

There are some inherent limitations to this approach. Firstly, the perfect functioning of the market, as described above, has many exceptions, such as asymmetric information, market power, externalities or price and wage rigidities. Over the past two decades, some of these phenomena have been incorporated in the models, but this process is far from complete. Secondly, the structural approach leads to a highly stylised model of the economy where, for example, the complexities of wage indexation in Belgium are summarised in a few estimated parameters which represent the observed rigidity of wages. In addition, business cycle effects are ignored. Consequently, the results of the model should be interpreted as long-term effects and the transition path of the macroeconomic variables should be considered as the expected timing of the effects rather than as a forecast.

¹¹ For a detailed description of the model, see:

- D'AURIA, F., PAGANO, A., RATTO, M. & VARGA, J. (2009), A comparison of structural reform scenarios across the EU member states: Simulation-based analysis using the QUEST model with endogenous growth. European Commission: Planning Paper 392, https://ec.europa.eu/economy_finance/publications/pages/publication16461_en.pdf
- RATTO, M., ROEGER, W. & IN 'T VELD, J. (2008), *QUEST III: An estimated DSGE model of the euro area with fiscal and monetary policy*. European Commission: Economic Papers 335, https://ec.europa.eu/economy_finance/publications/pages/publication12918_en.pdf

4.1.2. The QUEST III R&D model

The Belgian version of QUEST covers three geographical areas: Belgium, the rest of the eurozone and the rest of the world. Each region includes a household, a production, and a government sector.

The household sector maximises its welfare over time, on the one hand, by choosing between consumption and saving/investment, and on the other hand, by providing labour (of three types depending on the level of education). The model distinguishes between investment in research and development (R&D) and other forms of capital. Some households are subject to a liquidity constraint and can only spend their current income: consequently, there is no full Ricardian equivalence between financing by taxation or by government debt.

R&D capital is built up by highly qualified researchers, subject to geographical spillover effects, and increases the productivity of the private sector. Private sector firms mobilise capital goods and high, medium and low skilled workers. Their productivity is influenced by R&D capital, but also by public capital (especially infrastructure) and TFP. Competition is imperfect and creates cost margins. Measures that improve or worsen market functioning are simulated through the empirically estimated margin parameter.

Governments levy taxes on consumption, labour and capital, subsidises R&D investments and researchers' salaries, and finance social benefits, public consumption and public investment. As stated above, the latter increases private sector productivity. Levies and subsidies are calculated as implicit tax rates using DG TAXUD methodology.¹² A detailed description of the Belgian version of the model, as well as several simulation examples, is available on the FPB website.¹³

4.1.3. Simulation of measures contained in the RRP

The RRP contains both investment and reform measures. Only the investment measures have been simulated in this exercise. In principle, structural reforms in areas such as market functioning, administrative burdens, education and training can also be simulated with QUEST, but this requires a scientifically sound translation of policy measures into a set of model parameters. Such a translation was not available for the Belgian RRP reforms. Appendix 3 contains an overview of the reform measures that could have been simulated, a description of the transmission channels in QUEST and a qualitative characterisation of the ensuing effects.

Note that only measures which are strictly part of the Belgian RRP have been simulated. Therefore, as in the short-term analysis, the stimulus measures of the federal authorities and federated entities falling outside of the RRP, are excluded. Similarly, the effects of the RRP of other EU Member States are not taken into account, although they are likely to have significant effects. For example, a productivity increase in other Member States, leading to a fall in their production prices, could partially offset the positive effect of the Belgian RRP on the trade balance. Conversely, an increase in R&D investment in

¹² DIRECTORATE-GENERAL FOR TAXATION AND CUSTOMS UNION, EUROPEAN COMMISSION (2020), *Taxation Trends in the European Union*, 2020 edition, Publications Office of the European Union, Luxembourg, 2020.

¹³ FEDERAL PLANNING BUREAU (2018), *Description du modèle QUEST III R&D*, Beschrijving van het QUEST III R&D-model, https://www.plan.be/publications/publication-1848-en-description_du_modele_quest_iii_r_d

other Member States could also be favourable to productivity in our country given the international spillover effects between R&D stocks in the different countries.

The investments presented in the RRP are divided into five groups, modelled differently in QUEST III R&D:

1. Firstly, there is public investment in the strict sense of the national accounts, i.e. gross fixed capital formation (P51) within the general government (S13). This type of investment can be modelled directly by a rise in the public investment rate, which leads to an increase in public capital and thus improves private sector productivity.
2. Subsidies for private R&D investment are modelled as an increase in the tax credit for private R&D investment, which is calculated as an implicit subsidy rate. A rise in these subsidies increases R&D capital accumulation and improves private sector productivity.
3. Support for other private investment and production subsidies are modelled as a reduction in the implicit tax rate on capital income, again using the methodology proposed by DG TAXUD. All things being equal, these subsidies increase capital intensity.
4. Subsidies to households and non-profit institutions are modelled as a reduction in the implicit tax rate on consumption. All things being equal, this decline leads to an increase in private consumption.
5. Measures that do not fit into these first four channels, such as changes in the government wage bill, are treated as government consumption.

The budgetary cost of all these measures is borne by the government. Therefore, a compensatory financing shock corresponding to the RRF grant is introduced into the government budget equations (deficit and debt).

4.2. Results

4.2.1. Overall effects

Table 8 presents the medium- and long-term results of the simulation of the Belgian RRP. Note that the medium-term results (2026) are not quite identical to the corresponding HERMES results described in section 3.2. The differences arise from the different philosophies underpinning the two models, mainly with respect to the treatment of supply effects.

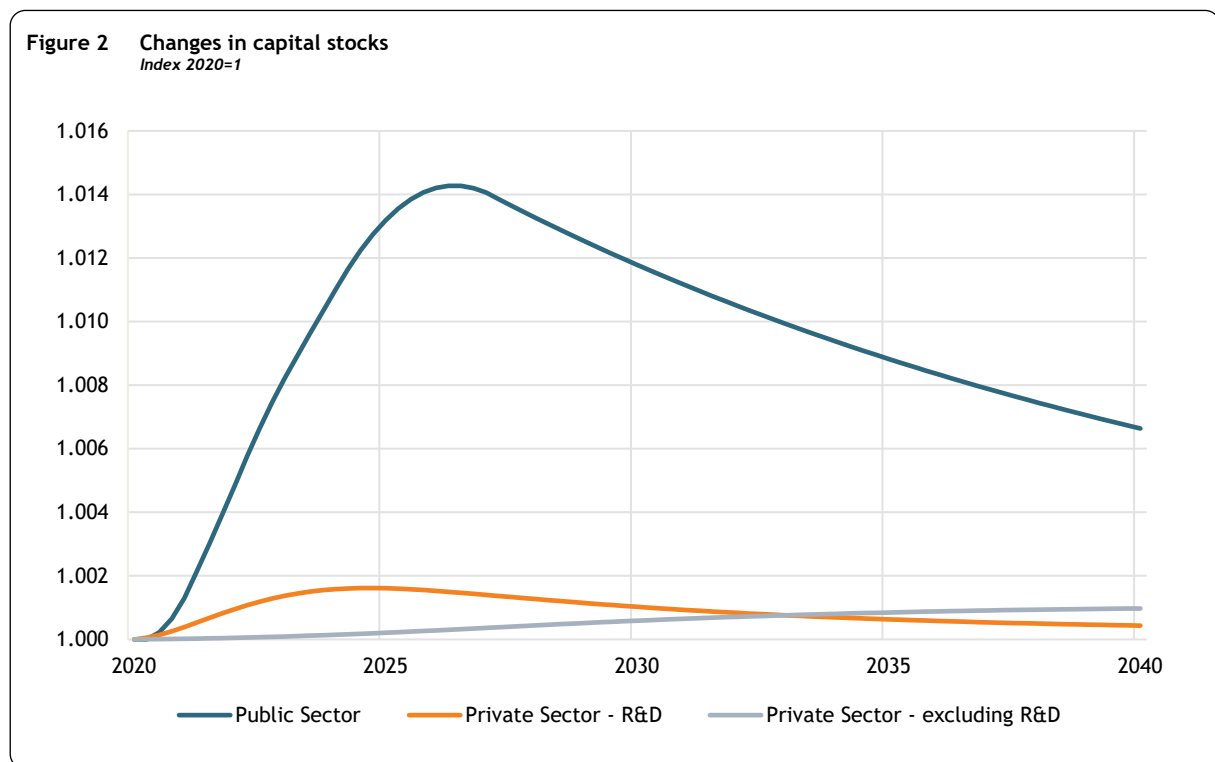
By 2030, GDP is expected to be 0.22% above its normal growth path. Supply effects are at the root of this, as shown directly by the increase in the labour productivity and indirectly by the negative GDP deflator, because a demand effect would rather cause prices to increase. The rise in exports and the fall in imports are further evidence on increased competitiveness. The increase in labour productivity mainly leads to a rise in wages, and only to a lesser extent, to a growth in employment: some 2,000 additional jobs would be created in 2030.

This positive impact on GDP fades slowly over the following ten years, given that the investment measures are temporary and the economy eventually returns to its balanced growth path. Similarly, the

number of jobs created on top of the normal growth path would fall to just over 1,000 jobs by 2040. However, this return to the normal path is slow for two reasons.

Table 8 Long-term macroeconomic effects
Differences in % (unless otherwise indicated) from the baseline scenario

	2026	2030	2035	2040
GDP (real)	0.23	0.22	0.18	0.14
Private consumption	0.09	0.10	0.08	0.07
Public consumption	0.19	0.16	0.13	0.11
Business investment, excluding R&D	0.12	0.15	0.13	0.12
Business investment, R&D	0.12	0.06	0.04	0.03
Public investment	1.82	0.16	0.13	0.11
Exports	0.14	0.15	0.12	0.09
Imports	-0.02	-0.06	-0.04	-0.03
GDP deflator	-0.12	-0.13	-0.11	-0.09
Real wage	0.15	0.15	0.12	0.10
Labour productivity	0.19	0.18	0.15	0.12
Employment rate	0.04	0.04	0.03	0.02
Government debt ratio (pp)	-0.52	-0.61	-0.76	-0.95



Firstly, the additional investment affects productivity through the increase in the respective capital stocks: production depends on the total private capital - R&D and other - as well as the total public capital. These capital stocks only gradually depreciate back to their equilibrium level, so that the measures' effects persist well beyond their implementation period. Figure 2 shows the evolution of the three relevant capital stocks over the 2020-2040 period. Clearly, private R&D capital and public capital reach their maximum change after ten years, while private non-R&D capital even reaches its maximum deviation after 20 years. Indeed, the return on private non-R&D capital is itself increased by the rise in R&D and public capital, which generates a feedback effect: even after the initial measures, additional private investment (in non-R&D capital) will be encouraged.

Secondly, the persistence of the effects is explained by another feedback effect: the increase in GDP also leads to a rise in the domestic components of aggregate demand, including investment. Table 8 shows that even long after the measures expire, investments in the three types of capital remain above their equilibrium level.

The measures are financed directly by the RRF and as such do not affect the government budget. However, they can indirectly influence the deficit, for example when they have a favourable impact on GDP, thereby increasing government revenue. In the simulation, these indirect changes in government revenue and expenditure are not compensated for fiscally so that the cumulative long-term effects are reflected in the evolution of government debt. The last row of Table 8 shows that the RRP without tax compensation lowers the government debt ratio by almost one percentage point by 2040.

4.2.2. Effects by axis

The effects by axis broadly follow the general trend. For each axis, the positive impact on GDP peaks after 10 years, after which a very gradual return to the equilibrium path takes place, as shown in Table 9. The magnitude of the impact does not depend solely on the size of the fiscal impulse, but also on its composition: resources dedicated to public and R&D investment generate long-lasting effects, while direct aid to private investment and public consumption are less important in this respect. Thus, while the total fiscal impulse of the first axis is greater than that of the third axis, the long-term impact on GDP of the latter is greater given the greater weight of public investment.

Although QUEST III R&D is a non-linear model, Table 9 shows that the effects of the plan as a whole correspond almost exactly to the sum of the different axes. This can be explained by the limited size of the shock: the smaller the shock, the more accurate the first order (linear) approximation of the effect.

Table 9 Long-term effects on GDP by axis
Differences in % from the baseline scenario

	2026	2030	2035	2040
Axis 1 - Climate, Sustainability and Innovation	0.05	0.05	0.04	0.03
Axis 2 - Digital Transformation	0.04	0.04	0.03	0.02
Axis 3 - Mobility and Public Works	0.08	0.08	0.06	0.05
Axis 4 - Social inclusion and Community	0.03	0.03	0.02	0.02
Axis 5 - Economy of the future and Productivity	0.03	0.03	0.02	0.02
Total	0.23	0.22	0.18	0.14

As already mentioned, the long-term effects on employment are very limited. Table 10 presents the results by axis. It is mainly the first three axes that generate jobs during the first 15 years. Public investment, rather than R&D investment, seems to be decisive in this respect. Indeed, whereas the fourth and fifth axes have a similar impact on employment, the fifth axis contains a much higher share of R&D investment. This is consistent with the logic of the model, according to which R&D capital increases productivity principally by raising the efficiency of private capital (excluding R&D) in the production process.

Table 10 Long-term effects on the employment rate by axis
Differences in % from the baseline scenario

	2026	2030	2035	2040
Axis 1 - Climate, Sustainability and Innovation	0.01	0.01	0.01	0.00
Axis 2 - Digital Transformation	0.01	0.01	0.01	0.00
Axis 3 - Mobility and Public Works	0.01	0.01	0.01	0.01
Axis 4 - Social inclusion and Community	0.01	0.01	0.00	0.00
Axis 5 - Economy of the future and Productivity	0.00	0.01	0.00	0.00
Total	0.04	0.04	0.03	0.02

Finally, Table 11 summarises the effects on the government debt ratio by axis. The effects become more pronounced over time, consistent with the assumption that changes in the government deficit are not offset and accumulate. The evolution by axis follows the general trend, differences between axes being linked to the respective size of the fiscal impulse and the respective impact on GDP.

Table 11 Long-term effects on the government debt ratio by axis
Differences in % points from the baseline scenario

	2026	2030	2035	2040
Axis 1 - Climate, Sustainability and Innovation	-0.15	-0.17	-0.20	-0.25
Axis 2 - Digital Transformation	-0.08	-0.10	-0.12	-0.15
Axis 3 - Mobility and Public Works	-0.15	-0.18	-0.23	-0.29
Axis 4 - Social inclusion and Community	-0.09	-0.10	-0.12	-0.15
Axis 5 - Economy of the future and Productivity	-0.06	-0.07	-0.08	-0.10
Total	-0.52	-0.61	-0.76	-0.95

Appendix 1 - The RRP according to the Classification of the Functions of Government (COFOG)

Table 12 presents an indicative breakdown of RRP expenditure according to the classification of the functions of government (COFOG). This breakdown is based on the codes given by the project proponents, corrected for obvious errors.

Apportioning expenditure into functional categories is a difficult exercise: although Eurostat defines the functional headings fairly precisely, questions inevitably remain as to the classification of certain projects, which could validly fall under several headings. In addition, within a given project, different expenditure items could relate to different functional categories. In this exercise, all project expenditure is allocated to the dominant project function. The breakdown of the RRP is proposed according to the COFOG level 1 classification in order to avoid the false precision that would result from an unreliable attempt to classify at level 2.

It should be noted that, with regard to investments in public buildings, social housing and private buildings, expenditure on energy-efficient renovation has been partly recorded in the Environmental protection category and expenditure on extending the building stock in the Housing and community amenities category.

Table 12 The RRP by COFOG category
In millions of euros unless otherwise stated

	2021	2022	2023	2024	2025	2026	2021-2026	2021-2026 (% of total)
General public services	78	163	147	141	60	11	601	9
Defence	0	0	0	0	0	0	0	0
Public order and safety	54	104	89	58	35	13	353	6
Economic affairs	387	557	548	570	413	156	2632	41
Environmental protection	245	312	163	112	73	24	928	14
Housing and community amenities	11	66	59	67	19	5	228	4
Health	5	37	21	16	4	0	83	1
Recreation, culture and religion	6	13	19	22	33	21	116	2
Education	256	280	118	142	106	134	1036	16
Social protection	33	147	93	75	65	21	434	7
Total	1076	1680	1259	1203	809	385	6411	100
Total (% of GDP)	0.23	0.34	0.24	0.23	0.15	0.07	0.21	

Table 13 provides an indicative functional breakdown of just the RRP expenditure intended for the government acquisition of fixed assets (gross fixed capital formation of general government).

Table 14 shows the breakdown of this same expenditure in the baseline scenario, i.e. the FPB's Economic Outlook 2021-2026 of February 2021.^{14,15} In this No-policy Change Outlook, the projection of public

¹⁴ FEDERAL PLANNING BUREAU (2021), *Perspectives économiques 2021-2026 – Version de février 2021, Economische Vooruitzichten 2021-2026- Versie van februari 2021*, <https://www.plan.be/publications/publication-2094-en>

¹⁵ The FPB projections are not made on the basis of the functional breakdown of expenditure, but on the basis of the economic breakdown. An ad hoc method was therefore used in the ex post breakdown of the public investments of the projection according to the functional classification. This method is described in DENIL, F., FROGNEUX, V., GENTIL, G., SCHOLTUS,

investment only takes into account previously budgeted investment, regardless of the RRP. Consequently, adding the amounts in Table 13 to those in Table 14 (the result of which is not presented here) would therefore predict the development of the total general government gross fixed capital formation in the event that the RRP is fully implemented.

Table 13 General government gross fixed capital formation of the RRG by COFOG category
In millions of euros unless otherwise stated

	2021	2022	2023	2024	2025	2026	2021-2026	2021-2026 (% of total)
General public services	57	96	114	115	55	9	446	13
Defence	0	0	0	0	0	0	0	0
Public order and safety	42	49	48	28	17	11	196	6
Economic affairs	291	330	323	366	289	73	1672	48
Environmental protection	7	27	34	15	3	2	87	3
Housing and community amenities	0	10	10	10	4	4	36	1
Health	4	20	18	16	4	0	62	2
Recreation, culture and religion	4	11	17	19	13	6	71	2
Education	221	210	75	93	80	130	808	23
Social protection	8	20	17	14	11	8	78	2
Total	634	772	656	676	477	242	3457	100
Total (% of GDP)	0.13	0.16	0.13	0.13	0.09	0.04	0.11	

Table 14 General government gross fixed capital formation in the baseline by COFOG category
In millions of euros unless otherwise stated

	2021	2022	2023	2024	2025	2026	2021-2026	2021-2026 (% of total)
General public services	4165	4206	4392	4553	4615	4714	26645	30
Defence	810	754	1435	1224	1245	1266	6733	8
Public order and safety	350	319	354	371	344	341	2080	2
Economic affairs	4433	4572	4742	4950	4899	4913	28508	32
Environmental protection	540	513	538	568	554	553	3265	4
Housing and community amenities	380	353	384	422	394	392	2324	3
Health	48	45	46	45	46	46	276	0
Recreation, culture and religion	935	837	926	1044	969	957	5668	6
Education	1807	1713	1765	1834	1833	1827	10779	12
Social protection	369	341	368	398	376	373	2226	3
Total	13836	13651	14951	15409	15275	15383	88504	100
Total (% of GDP)	2.93	2.75	2.91	2.90	2.80	2.74	2.84	

B., VAN BRUSSELEN, P. and VAN HOOLANDT, D. (2021), *Ventilation de la projection de la formation brute de capital fixe des administrations publiques dans les Perspectives de février 2021 en catégories COFOG*, internal note, Federal Planning Bureau.

Appendix 2 - The RRP axes by economic category of expenditure

Table 15 Axis 1 (Climate, Sustainability and Innovation) by economic category of expenditure
In millions of euros unless otherwise stated

	2021	2022	2023	2024	2025	2026	2021-2026	2021-2026 (% of total)
Acquisitions of fixed assets	11	107	158	188	117	131	710	33
Computer and telecommunication equipment	0	1	1	0	0	0	2	0
Transport equipment and other machinery and equipment	0	0	0	0	0	0	0	0
Buildings and civil engineering works	8	101	150	183	116	130	687	32
R&D, software, databases and other intellect. property rights	3	5	7	5	1	0	21	1
Grants to corporations for investment	88	168	176	195	159	91	877	41
Computer and telecommunication equipment	0	0	0	0	0	0	0	0
Transport equipment and other machinery and equipment	1	17	24	23	22	7	94	4
Buildings and civil engineering works	73	101	107	134	98	81	594	28
R&D, software, databases and other intellect. property rights	15	50	44	38	39	3	189	9
Other	151	213	92	58	24	8	546	26
Grants to households and NPI's for investment	131	160	37	25	7	0	359	17
Acquisition of non-financial non-produced assets	14	44	49	29	15	5	155	7
Subsidies on production and current transfers	2	6	6	3	2	2	21	1
Purchase of non-durable goods and services	4	3	1	1	0	0	9	0
Remuneration of public sector employees	0	1	0	0	0	0	1	0
Total	249	487	427	440	300	230	2133	100
RRF grant	248	473	406	410	277	206	2021	
Non-recoverable VAT	1	14	20	30	22	24	112	
Total (% of GDP)	0.05	0.10	0.08	0.08	0.05	0.04	0.07	

Table 16 Axis 2 (Digital Transformation) by economic category of expenditure
In millions of euros unless otherwise stated

	2021	2022	2023	2024	2025	2026	2021-2026	2021-2026 (% of total)
Acquisitions of fixed assets	110	159	152	105	60	33	620	71
Computer and telecommunication equipment	18	24	32	30	19	15	138	16
Transport equipment and other machinery and equipment	0	1	2	2	0	0	5	1
Buildings and civil engineering works	0	1	1	0	0	0	2	0
R&D, software, databases and other intellect. property rights	92	133	117	73	42	18	475	54
Grants to corporations for investment	3	29	10	8	0	0	51	6
Computer and telecommunication equipment	0	22	3	2	0	0	27	3
Transport equipment and other machinery and equipment	0	0	0	0	0	0	0	0
Buildings and civil engineering works	0	0	0	0	0	0	0	0
R&D, software, databases and other intellect. property rights	3	7	7	6	0	0	23	3
Other	27	70	50	37	19	4	207	24
Grants to households and NPI's for investment	2	2	2	0	0	0	6	1
Acquisition of non-financial non-produced assets	0	0	0	0	0	0	0	0
Subsidies on production and current transfers	0	2	2	2	2	0	10	1
Purchase of non-durable goods and services	22	60	43	32	17	4	177	20
Remuneration of public sector employees	3	5	3	3	0	0	14	2
Total	140	258	212	150	80	38	877	100
RRF grant	126	228	183	128	67	31	763	
Non-recoverable VAT	14	30	29	22	13	6	114	
Total (% of GDP)	0.03	0.05	0.04	0.03	0.01	0.01	0.03	

Table 17 Axis 3 (Mobility and Public Works) by economic category of expenditure
In millions of euros unless otherwise stated

	2021	2022	2023	2024	2025	2026	2021-2026	2021-2026 (% of total)
Acquisitions of fixed assets	263	228	202	269	237	48	1247	88
Computer and telecommunication equipment	0	0	0	0	0	0	0	0
Transport equipment and other machinery and equipment	33	68	22	50	6	1	179	13
Buildings and civil engineering works	170	152	177	219	231	47	996	70
R&D, software, databases and other intellect. property rights	60	8	3	0	0	0	72	5
Grants to corporations for investment	39	33	28	29	7	1	137	10
Computer and telecommunication equipment	0	0	0	0	0	0	0	0
Transport equipment and other machinery and equipment	1	7	5	3	1	0	17	1
Buildings and civil engineering works	34	22	19	23	7	1	105	7
R&D, software, databases and other intellect. property rights	4	5	4	2	0	0	15	1
Other	8	2	5	9	4	1	30	2
Grants to households and NPI's for investment	1	2	5	9	4	1	23	2
Acquisition of non-financial non-produced assets	0	0	0	0	0	0	0	0
Subsidies on production and current transfers	0	0	0	0	0	0	0	0
Purchase of non-durable goods and services	7	0	0	0	0	0	7	0
Remuneration of public sector employees	0	0	0	0	0	0	0	0
Total	310	263	235	307	249	50	1414	100
RRF grant	293	252	211	277	218	46	1299	
Non-recoverable VAT	17	11	24	30	30	4	115	
Total (% of GDP)	0.07	0.05	0.05	0.06	0.05	0.01	0.05	

Table 18 Axis 4 (Social Inclusion and Community) by economic category of expenditure
In millions of euros unless otherwise stated

	2021	2022	2023	2024	2025	2026	2021-2026	2021-2026 (% of total)
Acquisitions of fixed assets	226	195	21	13	10	5	469	51
Computer and telecommunication equipment	220	168	17	13	9	5	432	47
Transport equipment and other machinery and equipment	0	0	0	0	0	0	0	0
Buildings and civil engineering works	0	0	0	0	0	0	0	0
R&D, software, databases and other intellect. property rights	5	26	4	1	1	0	37	4
Grants to corporations for investment	2	35	66	53	52	12	220	24
Computer and telecommunication equipment	2	3	1	0	1	1	8	1
Transport equipment and other machinery and equipment	0	0	0	1	0	0	1	0
Buildings and civil engineering works	0	31	64	50	49	11	204	22
R&D, software, databases and other intellect. property rights	0	1	1	2	2	1	8	1
Other	35	87	50	48	17	1	239	26
Grants to households and NPI's for investment	0	0	0	0	0	0	0	0
Acquisition of non-financial non-produced assets	0	0	0	0	0	0	0	0
Subsidies on production and current transfers	0	17	14	13	4	0	48	5
Purchase of non-durable goods and services	10	23	29	28	6	0	96	10
Remuneration of public sector employees	25	47	8	8	7	1	95	10
Total	263	316	136	115	80	18	928	100
RRF grant	224	278	128	107	77	18	833	
Non-recoverable VAT	39	38	8	7	2	0	95	
Total (% of GDP)	0.06	0.06	0.03	0.02	0.01	0.00	0.03	

Table 19 Axis 5 (Economy of the Future and Productivity) by economic category of expenditure
In millions of euros unless otherwise stated

	2021	2022	2023	2024	2025	2026	2021-2026	2021-2026 (% of total)
Acquisitions of fixed assets	25	84	124	101	53	25	411	39
Computer and telecommunication equipment	0	2	3	3	1	1	10	1
Transport equipment and other machinery and equipment	1	1	11	8	6	3	31	3
Buildings and civil engineering works	8	33	60	70	40	20	230	22
R&D, software, databases and other intellect. property rights	15	47	50	20	6	2	140	13
Grants to corporations for investment	40	213	109	79	40	23	505	48
Computer and telecommunication equipment	0	26	6	7	7	3	49	5
Transport equipment and other machinery and equipment	0	0	0	0	0	0	0	0
Buildings and civil engineering works	4	25	9	9	7	0	53	5
R&D, software, databases and other intellect. property rights	36	163	95	64	26	20	403	38
Other	44	55	14	10	8	2	134	13
Grants to households and NPI's for investment	4	4	4	3	2	0	17	2
Acquisition of non-financial non-produced assets	1	1	0	0	0	0	2	0
Subsidies on production and current transfers	10	21	0	1	1	0	34	3
Purchase of non-durable goods and services	29	28	7	2	3	2	70	7
Remuneration of public sector employees	1	1	3	3	2	0	10	1
Total	109	352	247	190	100	50	1049	100
RRF grant	103	343	238	179	92	46	1002	
Non-recoverable VAT	6	9	8	12	8	4	48	
Total (% of GDP)	0.02	0.07	0.05	0.04	0.02	0.01	0.03	

Table 20 Axis 6 (Public Finance) by economic category of expenditure
In millions of euros unless otherwise stated

	2021	2022	2023	2024	2025	2026	2021-2026	2021-2026 (% of total)
Acquisitions of fixed assets	0	0	0	0	0	0	0	0
Computer and telecommunication equipment	0	0	0	0	0	0	0	0
Transport equipment and other machinery and equipment	0	0	0	0	0	0	0	0
Buildings and civil engineering works	0	0	0	0	0	0	0	0
R&D, software, databases and other intellect. property rights	0	0	0	0	0	0	0	0
Grants to corporations for investment	0	0	0	0	0	0	0	0
Computer and telecommunication equipment	0	0	0	0	0	0	0	0
Transport equipment and other machinery and equipment	0	0	0	0	0	0	0	0
Buildings and civil engineering works	0	0	0	0	0	0	0	0
R&D, software, databases and other intellect. property rights	0	0	0	0	0	0	0	0
Other	5	3	3	0	0	0	10	100
Grants to households and NPI's for investment	0	0	0	0	0	0	0	0
Acquisition of non-financial non-produced assets	0	0	0	0	0	0	0	0
Subsidies on production and current transfers	0	0	0	0	0	0	0	0
Purchase of non-durable goods and services	5	2	2	0	0	0	10	96
Remuneration of public sector employees	0	0	0	0	0	0	0	4
Total	5	3	3	0	0	0	10	100
RRF grant	4	2	2	0	0	0	8	
Non-recoverable VAT	1	0	0	0	0	0	2	
Total (% of GDP)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	

Appendix 3 - Reforms of the RRP and estimated long-term effects

The QUEST III R&D model is a simulation tool that is used, among other things, to estimate the macro-economic effects of structural reforms. In order to be simulated, the reform must be translated into the model's parameters and a scientifically valid empirical estimate of the effect of the reform on the model's parameter(s) must be available. This last constraint is the one that made the simulation impossible in the current exercise.

The RRP contains some 40 reforms spread across the different axes. The following table shows the reforms that could potentially be simulated in QUEST and the relevant transmission channels in the model. In general, there are three possible effects: measures that increase the participation rate promote employment, measures that reduce the risk premium on investments increase the capital intensity and other measures encourage potential growth.

Table 21 RRP reforms that can be simulated by QUEST¹

Reforms by axis and component	Transmission channels
Climate, Sustainability and Innovation	
<i>Emerging energy technologies</i>	
- A regulatory framework for the H2 and CO2 markets	Risk premium on private investment reduction and R&D investment stimulation
Digital Transformation	
<i>Public administration</i>	
- Simplification of administrative procedures: e-government for businesses	Reduction of administrative burden and ease of starting business
- E-government: Tendering procedure	Reduction of administrative burden
<i>Optic fiber, 5G & new technologies</i>	
- 5G Regulatory framework	Risk premium on private investment reduction and R&D investment stimulation
- Introduction of 5G	Risk premium on private investment reduction and reskilling of labour force
Social Inclusion and Community	
<i>Education 2.0</i>	
- Digisprong	Reskilling of labour force
- Higher education advancement fund	Reskilling of labour force
- Plan de lutte contre le décrochage	Upskilling of labour force
<i>Training and Employment for Vulnerable Groups</i>	
- Lutte contre la discrimination sur le marché de l'emploi	Increase in participation rate
- Stratégie de qualification et de requalification	Reskilling of labour force
- Reform on integration and activation	Increase in participation rate
Economy of the Future and Productivity	
<i>Training and labour market</i>	
- Régime de cumul et mobilité vers les secteurs avec pénuries	Increase in participation rate
- Brederde fiscale hervorming - Lastendruk op arbeid	Change in relative production factor costs
- Compte formation	Reskilling of labour force
- Levenslang leren	Reskilling of labour force
- Réforme de l'accompagnement des demandeurs d'emploi	Reskilling of labour force
<i>Supporting economic activity</i>	
- Optimising procedures: Snellere vergunnings- en beroepsprocedures	Reduction of administrative burden
- Verbreding Innovatiebasis	Risk premium on private investment reduction and R&D investment stimulation

1. The naming of the reforms is mentioned in the original language for the sake of accuracy.