The impact of the Recovery and Resilience Facility on the Greek economy

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The Recovery and Resilience Facility

- The RRF is the centrepiece of the temporary recovery instrument Next Generation EU (NGEU), the EU's response to the COVID-19 crisis

  - The RRF will provide up to EUR 672.5 billion in grants and loans to support public investments and reforms
    - EUR 312.5 billion in the form of grants and EUR 360 billion in the form of loans

  - In order to receive support from the RRF, Member States need to submit their Recovery and Resilience Plans (RRPs) to the EC
    - Description of reforms and investments
    - Targets, timeline
    - Estimated costs
    - Overall macroeconomic and social impact

The Greek RRP: strategic targets

- The Greek RRP aims at a set of ambitious investments and reforms under four main pillars, encompassing also part of the Pissarides Committee growth recommendations

Green: 37%
- infrastructure to increase renewable energy resources use
- energy-upgrade of buildings

Digital: 20%
- fast broadband, 5G
- digitalization of businesses and public sector

Employment, skills, and social cohesion
- digital skills
- upgrade of vocational education and training
- women in digital

Private investment and economic and institutional transformation
- support tourism, culture, manufacturing, agriculture; R&D; exports
- Improve business environment

The Greek RRP: Projections of disbursements profile

- **EUR 30.5 bn** over 2021-26
  - 18.08 bn grants
  - 12.42 bn loans

  (based on Ministry of Finance information as of 22.3.2021)

- **Allocation of grants:** 67% to public investment, 33% to government consumption

- **Allocation of loans:** 100% to finance private investment

- **Linear disbursement profile after 2021**
  - 2021: EUR 3.97 bn

  (pre-financing at 13% of funds)

  - Full absorption by 2026

Table 1: Expected RRF disbursements by year

	2021	2022	2023	2024	2025	2026	total 2021-2026
RRF funds (bn EUR)	3.97	5.31	5.31	5.31	5.31	5.31	30.50
of which							
Grants	2.35	3.15	3.15	3.15	3.15	3.15	18.08
Loans	1.61	2.16	2.16	2.16	2.16	2.16	12.42

Source: Bank of Greece estimates based on Ministry of Finance information as of 22.3.2021

Relevant studies

- European Commission (2020, 2021) provides estimates for the effects of the NGEU funds
  - GDP gains for the EU countries range between 1-4%
  - increase in GDP between 2.1-3.3% by 2026 for Greece

- Bańkowski et al. (2021) examine the effects of the NGEU instrument on the euro area and selected euro area countries (Germany, Italy, Portugal and Spain)
  - increase in GDP by 1.5% for the EA and between 0.7-4% for the individual countries over the medium term

- But…
  - they use the same policy instrument (public investment) to examine the effects of grands and loans
  - abstract from examining the impact of structural reforms

Our paper

- Provides a quantitative assessment of the potential macroeconomic effects of the stimulus and structural reforms supported by the RRF on the Greek economy

- Allows for a different treatment of grants and loans in line with the design of the RRF

  - grants are treated as budgetary neutral transfers to the government that allow an increase in public expenditures (consumption and investment) without affecting the public debt

  - RRF loans increase the public debt and are introduced as implicit investment subsidies to private investment

Preview of main findings

- The full implementation of the RRP (funds and structural reforms) can potentially increase the level of real GDP by 6.9% by 2026
  - private investment increases by around 20% and employment by 4%
  - the tax revenues-to-GDP ratio increases of 2.8 pp in 2026
- The stimulus financed by grants and loans raises the level of real GDP by 4.3% in 2026
  - the impact of loans on output is larger than that of grants
- Structural reforms can increase long-run output by around 6%
  - the digitalisation of public administration can further increase long-run output by 3.9%

How we work

- We establish these points in the context of a DSGE model where we consider three sets of policy simulations:
  - evaluation of the impact of the grants and loans
  - evaluation of the impact of the structural reforms
  - joint evaluation of the effects of funds and structural reforms

The model: Key features

- We use a micro-founded DSGE model (see Papageorgiou, 2014 and Papageorgiou and Vourvachaki, 2017) that features:
  - Two types of households differing in their ability to participate in asset markets
  - Small open economy that belongs to a currency area - there is no monetary policy independence
  - Real and nominal frictions in product and labour markets
  - Tradable and non-tradable sectors of production
  - Stylized financial market imperfections:
    - liquidity constrained households and working capital loans
    - sovereign risk channel (in the spirit of Corsetti et al., 2013)
  - A relatively detailed fiscal policy block
  - A variety of exogenous shocks

The model: Key features (cont.)

- Investment subsidy

$$(1+\tau_t^c)C_{i,t}^p + \frac{P_t^I}{P_t^C}(1-is_t)I_t^i + \frac{B_{i,t+1}}{P_t^C} + \frac{S_t F_{i,t+1}^p}{P_t^C} =$$
$$= (1-\tau_t^l)\left(w_{i,t}^p H_{i,t}^p + w_t^g H_{i,t}^g\right) + (1-\tau_t^k)\left(r_t^k u_{i,t} K_{i,t}^p + \Pi_{i,t}\right) +$$
$$+ R_{t-1}\frac{B_{i,t}}{P_t^C} + R_{t-1}^H \frac{S_t F_{i,t}^p}{P_t^C} + \bar{G}_{i,t}^{tr} - T_t^l$$

where

P_t^I , P_t^C : the price of a unit of the investment and consumption good, respectively

is_t : investment subsidy that reduces the cost of private investment for every unit spent by the private sector

The model: Key features (cont.)

- Production function in the tradable and non-tradable sectors

$$Y_{f,t}^{T} = A_t^{T}\left(K_{f,t}^{T}\right)^{a_T}\left(H_{f,t}^{T}\right)^{1-a_T}\left(K_t^{g}\right)^{a_G} - \Phi_T$$

$$Y_{f,t}^{NT} = A_t^{NT}\left(K_{f,t}^{NT}\right)^{a_{NT}}\left(H_{f,t}^{NT}\right)^{1-a_{NT}}\left(K_t^{g}\right)^{a_G} - \Phi_{NT}$$

  - Public capital, K_t^g, provides production externalities to private sector firms and introduces a channel through which fiscal policy affects output

$$K_t^g = (1-\delta^g)K_{t-1}^g + G_t^I$$

where G_t^I is government investment

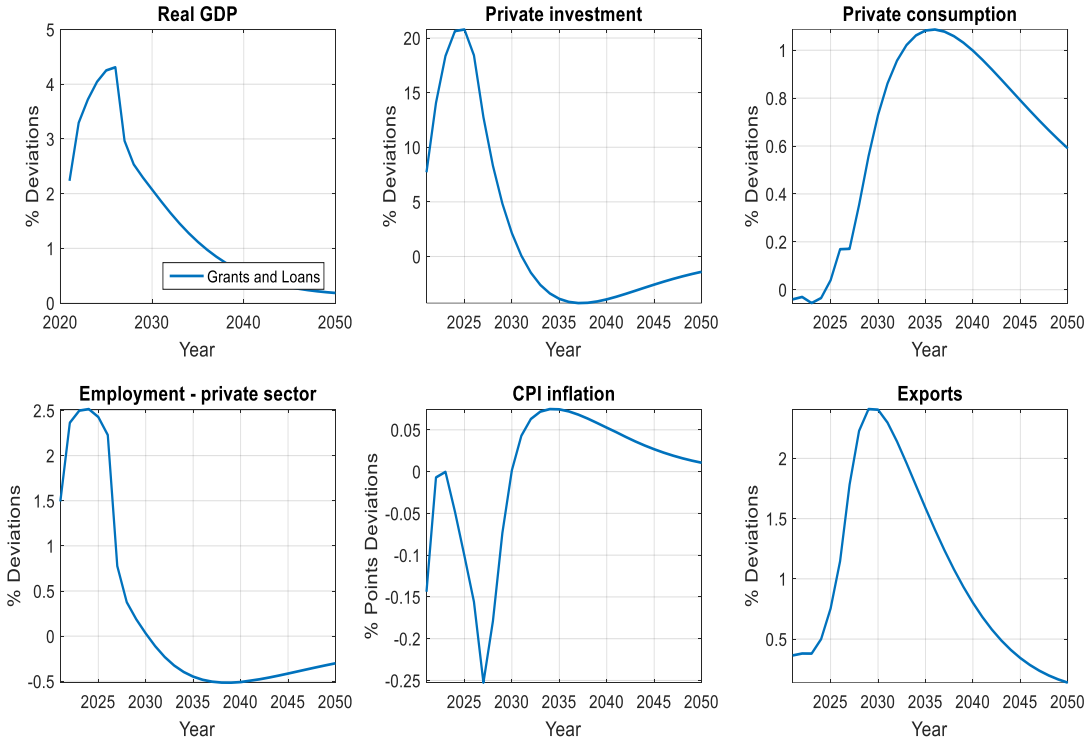
Policy simulations: Effects of grants and loans

- Methodology
  - Calibration of the model economy
    - The exogenous fiscal policy instruments are set equal to their average values in the data over the period 2017-19
  - We feed the model with the exogenous paths of the fiscal policy instruments
    - Grants are treated as an increase in government investment and consumption
    - Loans are treated as an increase in the investment subsidy-to-GDP ratio
    - Grants are budget neutral
    - Loans increase the public debt and are repaid by the households by 2058 via lump-sum taxes
    - After 2026 the government spending instruments return to their initial pre-reform levels
    - Simulate the model under perfect foresight

Dynamic effects of grants and loans

Figure 1: Impact of funds on the economy

(% deviations from the steady state)



- Real GDP increases by 4.3% in 2026
- Private investment and hours worked increase by 18.4% and 2.2%, respectively
- Improvement in the country's competitiveness triggers a rise in exports by 2.4%
- The tax revenues-to-GDP ratio increases by 1.6 pp (fiscal space)

- Higher investment subsidy → reduces investment price → higher investment demand → lower marginal costs → lower domestic prices → higher exports
- Grants → production externalities from public investment→ higher productivity of private inputs
- Grants → inflationary pressures → lower exports in the short run

Spending multipliers

- Present-value output multipliers T years after a change in the respective policy instrument:

$$\varphi_t = \frac{\sum_{t=0}^{T}\left(\prod_{j=0}^{t}\left(R_{t+j}\right)^{-1}\right)\Delta Y_{t+j}}{\sum_{t=0}^{T}\left(\prod_{j=0}^{t}\left(R_{t+j}\right)^{-1}\right)\Delta F_{t+j}}$$

where

ΔY_{t+j} : level changes in output

ΔF_{t+j} : level changes in the respective policy instrument of interest

R_{t+j} : return on government bonds

Table 2: Present-value discounted multipliers

Instrument	2021	2022	2023	2024	2025	2026	10 years	20 years
Grants	0.73	0.70	0.69	0.68	0.68	0.70	0.75	0.91
Loans	1.22	1.40	1.57	1.71	1.81	1.87	2.80	3.50
Total funds	0.93	0.99	1.05	1.10	1.15	1.18	1.56	1.95

Policy simulations: Effects of structural reforms

- Methodology

  - Map the reforms into the model's appropriate exogenous variables. We quantify a subset of reforms that
    - can be linked to structural indicators in the data
    - the empirical literature offers reliable estimates for the sensitivity of key economic variables with respect to changes in these indicators

  - Size and speed of the reforms
    - the size of the exogenous shocks are set so as to gradually close Greece's gap to average European practices over 10 years (by 2030) by at least 50%

  - Reforms are permanent and fully credible and start to be implemented in 2021

Policy simulations: Effects of structural reforms (cont.)

- We consider three sets of reforms corresponding to three distinct model channels
  - Reforms that enhance competition in the product market
    - 2019 PMR gap to EU closes by 2030 → Firms' price markup declines by 1pp
  - Reforms that support higher labour force participation
    - Participation rate increases to close half the 2019 gap to EU by 2030 → Labour supply increases by 4%
  - Productivity-enhancing reforms
    - Digital reforms: TFP increases by 1.89%
      - Increase in share of IT specialists in the population to 2019 EU average by 2030
      - Increase in share of firms using DSL or other broadband connection to 2019 EU average by 2030
    - Reforms that improve business environment: (PMR gap) increase in TFP by 1.22%

Effects of structural reforms on real GDP

Table 3: Joint effects of structural reforms on real GDP

Year	2021	2022	2023	2024	2025	2026	10 years	20 years
Real GDP	0.36	0.68	1.07	1.53	2.05	2.60	4.86	5.99

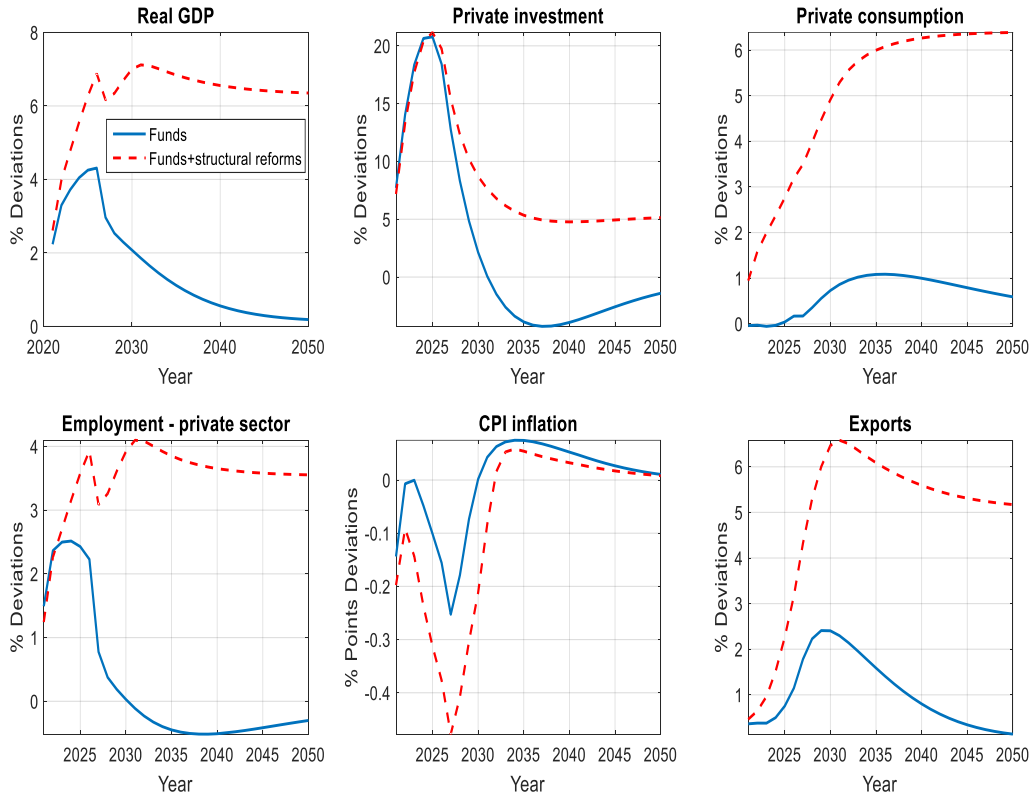
Table 4: Individual structural reforms

	Long-run effects (20 years)
Competition-enhancing reforms	1.25
Higher labour force participation	3.52
Productivity-enhancing reforms	1.19

Joint effects of funds and structural reforms

Figure 2: Overall impact of the RFF

(% deviations from the steady state)



- **Overall effects by 2026:**
  - Real GDP increases by 6.9%
  - Private investment increases by 20%
  - Employment increases by 4%
  - Tax revenues/GDP increase by 2.8 pp

- **Long-run gains**
  - Real GDP increases by 6%
  - Private investment increases by 8.5%
  - Employment increases by 3.7%
  - Real exports increase by 5%
  - Tax revenues/GDP increase by 2.8 pp

- **Additional reforms: digitalization of public administration**
  - Reforms are assessed through their impact on the fraction of time allocated to productive work
  - We link productive work effort with the time that individuals can save from a digital interaction with the government
  - Real GDP increases by a further 3.9% in the long run

Conclusions

- The RRF constitutes a significant growth opportunity for the Greek economy

- The full and timely implementation of the RRP has the potential to bring about significant benefits to the Greek economy
  - Real GDP is expected to increase by 6.9% in 2026 and by 6% in the long run
  - Strong multiplier effects of channelling the RRF loans to finance private investment
  - Large gains in terms of investment, employment and tax revenues

- Delays in the implementation of structural reforms and less than full absorption of the RRF funds would curtail the potential benefits from the RRF

Thank you!

Back up slides