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A macroeconomic assessment of the Italian National Recovery and Resilience Plan

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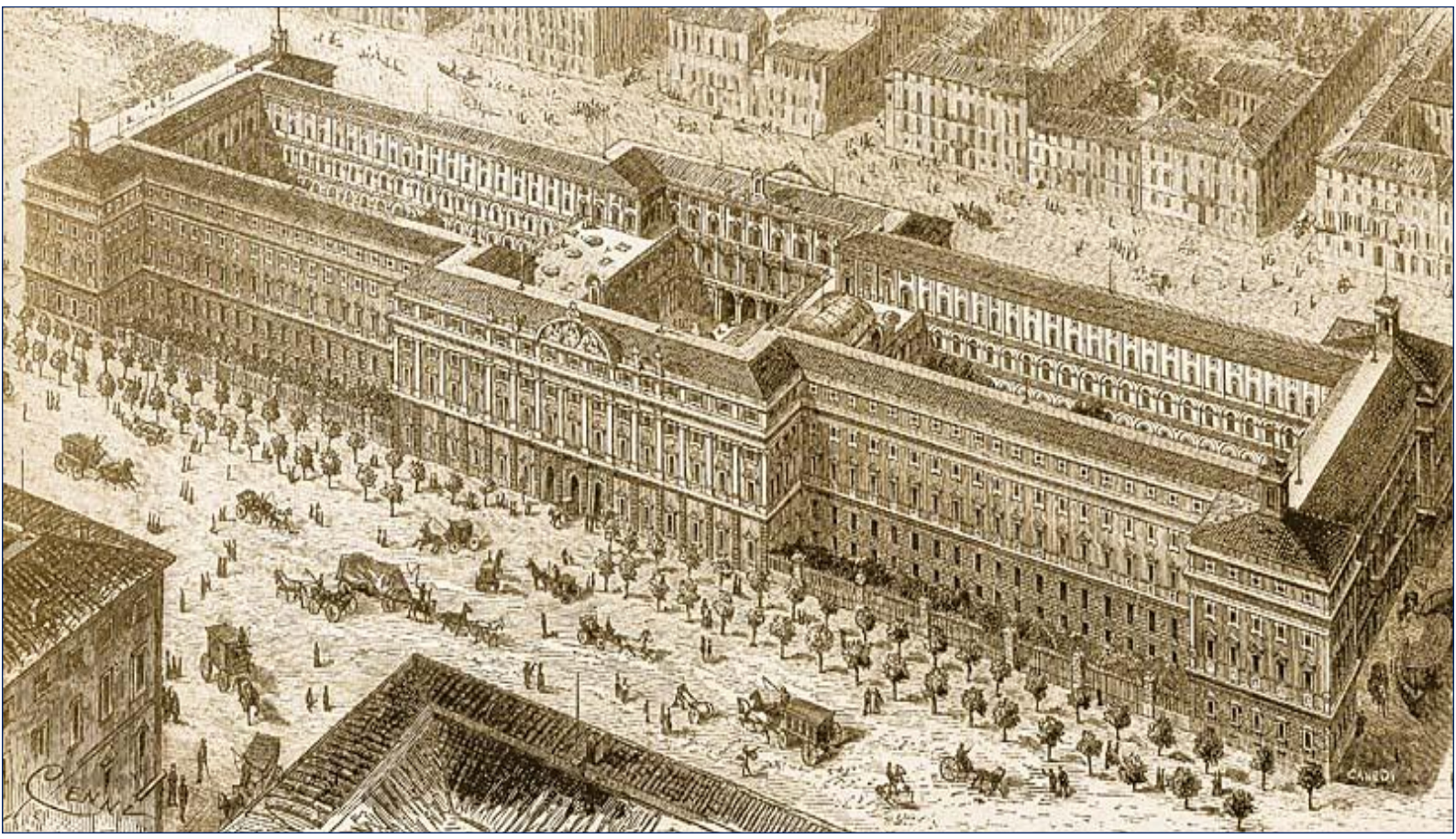

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Indice

A macroeconomic assessment of the Italian National Recovery and Resilience Plan*

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Abstract

This paper aims at assessing the macroeconomic and distributional impact of the Italian National Recovery and Resilience Plan (NRRP), which translates the Next Generation EU into action. We use a large-scale dynamic stochastic general equilibrium model adapted to capture the effects of the NRRP instruments. The Plan is mapped onto the model by using granular information available at the Ministry of Economy and Finance. Our results suggest a sizable impact on key macroeconomic variables, which is mainly driven by investments. The impact on the functional distribution of income is initially adverse for profits, which decline in the early years because of the increase in labor and capital demand. However, profits suddenly move above their initial level after GDP increases. Overall, the selection and design of the public-investment programs emerge as a crucial condition for the success of the Plan.

JEL Classification: C54, E62, E65, F54, F47.

Keywords: NRRP, macroeconomic impact, fiscal policies.

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1. Introduction

The Next Generation EU (NGEU) is the main European Union-wide response to the economic crisis triggered by the COVID-19 pandemic. It represents a never-before-seen fiscal spending effort that breaks away from the austerity policy adopted after the 2008 financial crisis. It provides about €807 billion in loans and grants distributed among EU member states. The National Recovery and Resilience Plans (NRRPs) translate the NGEU into action, defining a broad and ambitious package of investments and reforms.[1]

This paper aims at providing an assessment of the macroeconomic and distributional impact of the Italian NRRP by using the QUEST-III R&D macro-model.[2] By using granular policy information available at the Italian Ministry of Economy and Finance, we map the policy actions of the NRRP into the model. In a nutshell, we grouped single expenditure items in five transmission channels: (i) public investments; (ii) incentives for business investments; (iii) government current expenditures; (iv) government transfers to households; (v) reductions of employer social security contributions (SSC). It is worth noting that our paper does not quantify the impact of structural reforms associated to the NRRP.[3]

Our findings show that GDP would grow steadily over the period 2021-2026 and in 2026 its level would be 3.4% higher compared to a baseline alternative scenario without the Plan. In the short term, the NRRP boosts aggregate demand. As a result, demand for labor and capital factors increase. Considering a longer-term horizon, it boosts the productivity mainly through the build-up of the public capital stock. It is worth noting that our assessment is based on the information from the NRRP published by the Italian Government at the end of April 2021 and on the following updates.[4]

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[1] The NGEU is part of an ongoing change in the EU policy stance, whose nature in the long term is not yet fully defined. See Buti and Messori (2021) and Buti and Papacostantinou (2021).

[2] QUEST-III R&D is a medium-scale DSGE model with a rich fiscal structure developed and estimated/calibrated by the European Commission for the Italian economy and available at the Treasury (Ministry of Economy and Finance) to analyze the effects of fiscal policies and structural reforms. The model is described in Roeger *et al*. (2008), D'Auria *et al*. (2009) in details. See also Ratto *et al*. (2009), Coenen *et al*. (2012), Pfeiffer *et al*. (2020, 2021), and Roeger *et al*. (2021).

[3] See PCM (2021), Section 4 for the assessments of the main structural reforms. See also Buti and Messori (2021b), Messori (2021), and Corti and Núñez Ferrer (2021) on this point.

[4] It should be noted that the expenditure assumptions are not the same as those used in PCM (2021).

The impact of the Plan on the functional distribution of income is heterogenous in the first years, where a trade-off emerges between different income categories. We find that income from wages, capital, and bond increases at the cost of a reduction in the income from profits. However, in the medium term this trade-off disappears, as the increasing fiscal stimulus allows a generalized increase of income except for unemployment benefits and transfers, that decrease thanks to improvements in employment.

The assessment highlights the potential relevance of the NRRP for the Italian economy in the medium and long term. However, it also highlights the risks involved. The success of the Plan is mainly linked to the efficiency of public investments and consequently to the ability to select, design, and implement tangible and intangible infrastructures – internalizing social externalities.

Our paper is significantly indebted with and related to Ramey (2020), who closely investigates the impact of infrastructure investment on output in the short and long run. Much of the expenditure associated with the NRRP consists in fact in public investments, whose impact evaluation is formalized in a DSGE environment stressing the relevance of implementation delays - inherent in infrastructure projects - that reduce short-run multipliers even when government capital is productive.

This study is also connected to Bańkowski *et al*. (2021) and Pfeiffer *et al*. (2021), which assess the macroeconomic impact on the NGEU.

Bańkowski *et al*. (2021) study alternative uses of NGEU funds by using the DSGE-EAGLE model on an aggregate perspective. They compare the potential effects of productive public investment, unproductive government spending, and the repayment of the existing sovereign debt. The work of Pfeiffer *et al*. (2021) is more closely related. They provide an assessment of a stylized recovery Plan focusing on fiscal spillovers. We share with them the approach and methodology.

Pfeiffer *et al*. (2021) suggest that a simple aggregation of the national effects of individual investment plans would substantially underestimate the impact of NGEU. As expected, the underestimation effects are particularly large for small, more open-to-trade countries.[5] Pfeiffer *et al*. (2021) consider a stylized plan, where all expenditures are

therefore, the results of the two studies, even if related, are not strictly comparable.

[5] They suggest that the aggregate effects are around one third larger when explicitly accounting for the

considered as public investments, abstracting from country-specific details of the NRRPs. We instead map the Plan into the model by using granular policy information from the Italian Ministry of Economy and Finance considering different transmission channels. Although focused on Italy, following the insights of Pfeiffer *et al*. (2021), we account for the spillovers introducing stylized plans for the other European countries.

Our paper somehow complements Di Bartolomeo *et al*. (2021), who evaluate the macroeconomic impact of the emergency fiscal measures introduced by the Italian Government during the lockdown due to the COVID-19 pandemics in 2020. The economic policy response to COVID-19 has been swift and sizeable, preventing mass layoffs. In this respect, it also complements Pfeiffer *et al*. (2020), where policies to contain the effects of the COVID19 are also considered but at the aggregate European level. Di Bartolomeo *et al*. (2021) and Pfeiffer *et al*. (2020) focus on the immediate reaction to the lockdowns imposed by the emergency, we instead look at the long-lasting response to the pandemics-induced economic crisis.

In evaluating the distributional impact of the Plan, this paper borrows from Roeger *et al*. (2019) who use a different version of the QUEST model to evaluate the effects and trade-offs of structural reforms on the functional distribution of income in EU member countries. It is worth noting that empirical evidence on the distributional impacts of the COVID-19 pandemic suggests that inequality is likely to increase in the absence of strong policy actions (Furceri *et al*., 2021 and references therein).

The rest of the paper is organized as follows. The next section overviews the Italian NRRP. Section 3 provides a brief description of the model and the equations related to the channels used to simulate the impact of the plan. Section 4 and 5 illustrate our findings. The former focuses on the macroeconomic outcomes, the latter on the effects on the (functional) distribution. A final section concludes.

2. The Italian Recovery and Resilience Plan

The Italian NRRP defines an ambitious package of investments and structural reforms to unleash Italian growth, promoting digitalization and innovation, social cohesion, and the ecological transition. Overall, the Plan mobilizes €222.1 billion of which €191.5 from the

spillover effects from individual country plans.

NGEU Recovery and Resilience Facility (RRF), while €30.6 billion are from complementary national resources. Additional €13.0 billion are from the NGEU ReactEU, projects financed with this program complement those contained in the actual NRRP.[6]

The aim of the RRF facility is to provide financial support to EU member states through grants and loans to cope with the enormous economic and social consequences of the COVID-19 crisis and allowing a strong and coordinated response, both at the Union and national level. Beyond the short-term, RRF funded investments and structural reforms should set the European economies on a path of sustained and sustainable economic growth in the medium and longer term, leveraging on the opportunities of the green and digital transition (Buti and Messori, 2021b, 2021c). As previously mentioned, the complementary fund supplements the RRF funding with additional national resources.

The ReactEU program constitutes a bridge to the long-term recovery Plan, channeling additional grants to finance initiatives that supports job maintenance and creation, as well as measures to support the health care system and other crucial sectors to lay the basis of the recovery.

Along three strategic axes (digitization and innovation; ecological transition; and social inclusion), the NRRP is distributed across six priority areas (or missions), which group 16 components. Funds are allocated for selected projects in the fields of digitalization, innovation, competitiveness, culture, and tourism; green revolution and ecological transition; infrastructure for sustainable mobility; education and research; inclusion and cohesion; and health. As per the rules of RRF, the priority areas of green and digital transitions absorb about 38% and 25% of funds.

The total amount for digitalization, innovation, competitiveness, and culture (Mission 1 alone) sums up to €49.0 billion. Here, the single largest investment item of all the RRF is the Transition 4.0 plan (€13.4 billion), which aims to boost business investment in R&D and skills. Considerable funds are also devoted to the development of superfast internet, i.e., broadband and 5G (€6.7 billion). Green revolution and ecological transition (Mission 2) absorb €68.6 billion; among these, the largest slice will subsidize energy efficiency improvements, through €14 billion

[6] The NGEU comprises additional programs not considered in this study, namely Horizon Europe, InvestEU, Rural Development, Just Transition Funds, and RescEU.

of tax credits to households ("ecobonus" and "sismabonus") and €1.4 billion to municipalities (for public buildings and guard against climate risks). In the remaining four missions, the government is making sizeable investments in high-speed railways (€13.2 billion); education, focusing on early childhood education plan and redevelopment (€4.6 billion) and safety plan for school buildings (€3.9 billion); job search and training services (€4.4 billion) for the territorial cohesion and social inclusion; new technology and digitization in hospitals (€4.1 billion) and healthcare and assistance at home, including telemedicine (€4 billion), which are the largest investments items in healthcare;

The total endowment and source of financing considered for the simulations are summarized in Table 1. In our macro assessment, we only consider the additional resources, namely those funding that will finance additional projects with respect to a scenario without the NGEU-related measures. Moreover, we focus on the period 2021-2026 which is the official time frame for the Plan. According to our definition, additional funding sums up to €183.8 billion, corresponding to projects financed through RRF funds for new projects, the national Complementary fund, and the React-EU program. We also consider the RRF resources linked to the Development and Cohesion Fund (FSC) that, as outlined in the official Plan, can be considered as additional with respect to a no-policy change scenario (PCM, 2021:247).

Table 1 – NRRP: Total and additional resources, €billion

RRF Grants	68.9
RRF Loans	122.6
Total RRF	**191.5**
New projects in RRF	124.6
Development and Cohesion Fund in RRF	15.6
Complementary Fund	30.6
React-EU	13.0
Total additional resources	**183.8**

Notes: Total additional resources are the sum of RRF funds for new projects, Complementary Fund, React-EU, and additional funding from the Development and Cohesion Fund (FSC).

To model the Plan, we used granular data on the NRRP. Granular information

is provided in the Annexes to the NRRP published by the Italian Government at the end of April 2021, updates provided by the State General Accounting Department (RGS), and on the additional information contained in the legislation ruling the national complementary funds allocations (Law No. 101/2021). About 290 expenditure items were scrutinized and mapped in five different categories. Specifically, we associated each single item to: (i) public investments; (ii) incentives for business investments; (iii) government current expenditures; (iv) government transfers to households; (v) reductions of employer social security contributions on labor.

3. The model

The Plan assessment is performed by using QUEST, i.e., the macroeconomic model developed at the Directorate General for Economic and Financial Affairs (DG ECFIN). Specifically, we used the large-scale multi-country R&D version calibrated for Italy, which is the usual reference for public investments and structural reforms evaluations. It includes semi-endogenous technological changes, both investment in tangibles and intangibles, and disaggregates employment into three skill categories. In this section we discuss some aspects of the model which are relevant for the NRRP evaluation. We refer for the full description of the standard features to Roeger *et al*. (2008) and D'Auria *et al*. (2009).[7]

3.1 Overview

The multi-region model formalizes three economies: Italy, the rest of the euro area (REA), and the rest of the world. The structure, for each of these three regions, is as follows. The economy is composed of households, non-financial firms operating either in the domestic market or in the import-export sector, R&D institutes, a government, and a central bank which is shared between Italy and the REA. Agents face nominal and real rigidities (i.e., price and wage stickiness and adjustment costs associated with employment and investment).

Households are of two types (two-agent New Keynesian, TANK, assumption).[8]

[7] All equations of the baseline model and their descriptions are reported in Appendix A of D'Auria *et al*. (2009). Further details are available upon request.

[8] See, among others, Galí *et al*. (2007), Bilbiie (2008, 2020), Colciago (2011), Motta Tirelli (2012), and Bilbiie and Straub (2013).

Non-liquidity-constrained (Ricardian) households take decision about consumption and labor supply, have access to financial markets, accumulate physical capital subject to adjustment cost that rent out to the intermediate sector, and buy patents created by the R&D sector to license them to intermediate firms. Ricardian households receive revenues from wages, unemployment benefits, transfer income from the government and interest income on bonds and capital. On the other side, liquidity-constrained households do not have access to financial markets, and they simply consume their current income stemming from labor net of taxes, unemployment benefits and transfers. Members of both kinds of households offer low-, medium-, and high-skilled labor services indexed by $s \in (L, M, H)$.

Wage setting occurs under monopolistic competition, as workers supply differentiated labor in each skill group. A union act as a wage setter, imposing a wage mark-up over the competitive wage. Nominal rigidities are imposed by assuming adjustment cost proportional to wage changes.

The model features three sectors on the production side. In the final-good sector, firms produce differentiated goods by combining intermediate inputs and a labor aggregate in a monopolistically competitive environment which allows them to set a mark-up over the marginal costs. As we shall see in Section 3.5, the productivity enhancing contribution of public investment is taken into consideration by introducing public capital in the production function as an additional and exogenous factor of production. After paying an entry-fee to enter the market, monopolistically competitive intermediate firms rent physical capital designs produced by the R&D sector to transform each unit of capital into a single unit of an intermediate input, which they sell to final-good firms.

The R&D sector is assumed to be operated by a research institute. The latter employs high-skilled labor and produce intangible capital (designs) according to an ad-hoc rule where the stock of knowledge depends on the existing domestic and foreign stock. The first evolves according to agent's optimization choices while the latter is exogenous and simply depends on a calibrated rate of growth.

Private and public consumption and investment are combinations of domestic and foreign varieties of final goods aggregated through calibrated CES functions. Finally, government expenditures in steady state are based on simple rules and proportional to

GDP, while the central bank follows a Taylor-type rule based on the observed deviation from the inflation target and the potential output.

3.2 Government transfers to households

Each household i aims to maximize a discounted intertemporal utility function defined on consumption (C_t^i) and leisure ($1 - L_t^{i,s}$):

$$(1) \qquad V_0^i = E_0 \sum_{t=0}^{\infty} \beta^t \left((1-\theta) log\left(C_t^i - \theta_C C_{t-1}\right) + \sum_s \frac{\omega_s}{1-k} (1 - L_t^{h,s})^{1-k} \right),$$

where β is the discount factor; instant utility from consumption accounts for habit persistence (θ_c), while a CES preference for leisure is assumed, which is based on a common labor supply elasticity ($1 - k$), but skill-specific weights (ω_s).

The budget constraint of the representative Ricardian household i is:

$$(2a) \qquad (1 + t_t^c) P_t^C C_t^i + \Lambda_{F,t,t-1}^i + \Lambda_{R,t,t-1}^i = \Omega_L^{i,s} + PR_t^i + TR_t^i,$$

where C_t^i refers to real consumption, t_t^C are taxes on consumption, and P_t^C is the consumption utility deflator. In addition, $\Lambda_{F,t,t+1}^i$ and $\Lambda_{R,t,t+1}^i$ are the net financial and real investments between t and $(t-1)$, where the latter are subject to adjustment cost on real capital and capacity utilization; $\Omega_L^{i,s}$ is the after-tax labor income, which is obtained from all kinds of labor supplied, plus the unemployment benefits for households' members who are unemployed, net of the wage adjustment costs; PR_t^i are profits from final and intermediate firm ownerships while TR_t^i are government transfers. After tax, real investments can be allocated to the acquisition of new tangible capital (J_t^i) or intangible ($J_t^{A,i}$) capital; therefore, $\Lambda_{R,t,t-1}^i$ is the sum of two components:

$$(2b) \qquad P_t^I \left(J_t^i + \Gamma_J(J_t^i) \right) - \left(1 - t_{t-1}^k\right)\left(i_{t-1}^K - rp_{t-1}^K - \xi_t^{rp}\right) P_t^J K_{t-1}^i - t_{t-1}^K \delta^K P_t^I K_{t-1}^i - \tau^K P_t^I J_t^i,$$

$$(2c) \qquad P_t^A J_t^{A,i} - \left(1 - t_{t-1}^k\right)(i_{t-1}^A - rp_{t-1}^K) P_t^A A_{t-1}^i - t_{t-1}^K \delta^A P_t^A A_{t-1}^i - \tau^A P_t^A J_t^{A.i},$$

where P_t^I and P_t^A are tangible and intangible capital prices; i_t^K and i_t^A are their rental rates; rp_{t-1}^K and rp_{t-1}^A are their risk premia; ξ_t^{rp} is an exogenous shock on the risk premium of tangible capital;[9] δ^K and δ^A are their depreciation rates; t_t^K is the capital tax, which is the same for both; τ^K and τ^A are tax credits received by households that invest in tangible and intangible capital. Accumulation of tangible (K_t^i) and intangible $\left(A_t^i\right)$ capital exhibit

[9] Investors into tangible and intangible capital require premia to cover the increased risk on the return related to these assets.

the following dynamics:

(3) $K_t^i = J_t^i + (1 - \delta^K)K_{t-1}^i$,

(4) $A_t^i = J_t^{A,i} + (1 - \delta^A)A_{t-1}^i$,

where J_t^i and $J_t^{A,i}$ are investment in physical and intangible capital, while δ^K and δ^A are the depreciation rates of the two capital stocks.

The liquidity-constrained households do not own any financial wealth. Therefore, they do not smooth their consumption over time and consume all their disposable wage and transfer income in each period. The real consumption of each liquidity-constrained household is the net wage income plus transfers from the government. The real consumption of each liquidity-constrained household k is then:

(5) $C_t^k = \frac{\Omega_L^{k,s} + TR_t^k}{(1+t_t^c)P_t^C}$,

where $\Omega_L^{k,s}$ is the after-tax labor income, which as before is obtained from all kinds of labor supplied, plus the unemployment benefits, net of the wage adjustment costs and TR_t^k are transfers from the government. Total government transfers to households are thus the sum of TR_t^i and TR_t^k. They enter in a lump-sum fashion in the budget constraint of Ricardian households while they directly affect the consumption of liquidity-constrained households.

Transfers are used to simulate the NRRP measures related to scholarships and to energy efficiency and building requalification ("ecobonus" and "sismabonus" measures). Given that the bulk of the energy efficiency and building requalification measures are devoted to housing and construction, we augmented the transfer simulation assuming an increase of private investments proportional to the resources allocated to these measures, which quickly transmit on the economy as construction sector leads the cycle. Formally, this is obtained through an exogenous negative shock on risk premium on tangibles as introduced in Equation (2a).[10] We considered a risk premium shock able to increase private investment as much as the additive resources allocated to energy efficiency and building requalification measures. Note that the channel is very effective for mapping the incentives as timing and amounts of resources allocated can be exactly calibrated.

[10] The shock is introduced in a separate, ad-hoc simulation and added (linearly) to the main one.

3.3 Incentives for business investments

Non-Ricardian households maximize their utility function subject to their budget constraint and the laws of motion for tangible and intangible capital. Starting from the first order conditions of the maximization problem is possible to show that investment evolves according to a standard Tobin's Q equation:

$$(6) \qquad Q_t^i = 1 + \gamma_K \left(\frac{J_t^i}{K_{t-1}^i} - \delta^K\right) + \gamma_I \left[\Delta J_t^i - E_t\left(\frac{\Delta J_{t+1}^i}{i_t - \pi_{t+1}^C}\right)\right] - \tau^K,$$

where Q_t^j represents the present discounted value of the rental rate of return from investing in physical capital; γ_K and γ_I are parameters governing the magnitude of investment and capital adjustment costs; $(i_t - \pi_{t+1}^C)$ is the rental rate of physical capital, with π_{t+1}^c being the expected inflation on investment goods. An increase in tax-credits (τ^K) makes private investments cheaper, thus favoring the accumulation of physical capital. This makes projects with lower expected values profitable, with positive effects on market entry and thereby innovation. To see this, we should briefly describe the production-side of the model.

The final good producer uses intermediate goods and labor aggregate, combining low-, medium-, and high-skilled labor inputs subject to fixed costs. Intermediate goods are produced in a monopolistically competitive intermediate sector, where firms enter the market by paying a fixed entry cost and by renting tangible capital inputs and a design created by the R&D sector. After renting the design, firms can transform one unit of capital into a single unit of intermediate input. The R&D sector is based on a spillover augmented version of Jones (1995) where the driving equation of the knowledge stock (A_t) evolves according to:

$$(7) \qquad \Delta A_t = v A_{t-1}^{*\varpi} A_{t-1}^{\phi} L_{A,t}^{\lambda} \ ,$$

where ϖ and ϕ are parameters ruling the degree of foreign and domestic spillover from national (A_t) and foreign (A_t^*) knowledge stock; v is the total factor efficiency of R&D sector while λ is the elasticity with respect to the number of researchers $(L_{A,t})$.

Under this setup it is possible to show that entry into the intermediate sector occurs when the present discounted value of profits of the intermediate sector (PR_t^x) is higher than the fixed-entry cost plus the net value of patents:

$$(8) \qquad PR_t^x > i_t^A P_t^A + (i_t^A + \pi_{t+1}^A) FC_A,$$

where i_t^A is the rental rate of intangible capital, P_t^A the price of one unit of intangible

capital, π_{t+1}^{A} the related inflation, and FC_A the fixed cost that intermediate firms pay to enter in the market.

The introduction of tax credits on private investments reduces firms' costs, increases profits, and induce higher entry. Moreover, given that one unit of capital is used to produce one unit of intermediate good, in equilibrium the stock of knowledge is proportional to the stock of physical capital:

(9) $$\int_0^{A_t} x_{i,t}\, di = K_t$$

where $x_{i,t}$ is the output of the *i*-th intermediate firm, and K_t the stock of private capital.

3.4 Employer social security contributions

Labor is aggregated by a CES function:

(10) $$L_{Y,t} = \left(s_L^{\frac{1}{\sigma_L}} (e_L L_t^L)^{\frac{\sigma_L - 1}{\sigma_L}} + s_M^{\frac{1}{\sigma_L}} (e_M L_t^M)^{\frac{\sigma_L - 1}{\sigma_L}} + (s_H - s_A)^{\frac{1}{\sigma_L}} \left(e_H (L_t^H - L_{A,t})\right)^{\frac{\sigma_L - 1}{\sigma_L}} \right)^{\frac{\sigma_L}{\sigma_L - 1}},$$

where σ_L is the elasticity of substitution between different labor types; s_L, s_M, s_H, s_A are the population shares of labor-force in the low-, medium-, high-skilled, and in the R&D sector, who employs only high-skilled; e_L, e_M, e_H are the corresponding efficiency unit.

As an example, in a symmetric equilibrium, the demand equation for labor type medium (*M*) is given by:

(11) $$W_t^M = \alpha \frac{Y_t + FC}{L_{Y,t} - FC_L} \left(\frac{L_{Y,t}}{L_t^S} \right)^{\frac{1}{\sigma_L}} s_M^{\frac{1}{\sigma_L}} e_M^{\frac{\sigma_L - 1}{\sigma_L}} \eta_t \xi_t^{L,M},$$

where Y_t is the final output, FC are fixed costs; FC_L overhead labor; η_t the inverse wage mark-up, and $\xi_t^{L,M}$ an exogenous shock on the demand for labor-type medium. For this application the latter shock can be considered as an innovation to the employer SSC, after having included it also in the government budget constraint. Labor demand equations for labor types low (*L*) and high (*H*) are of the same type of equation (11).

The reduction in SSC contributions foreseen in the Plan is introduced through proportional exogenous shocks on labor demands associated to the different kind of workers based on their relative share in the model.

3.5 Public investments

Investments are the cornerstone of the NRRP. The resources allocated for public investment account for 62% of the total.

In the short term, the impact of public investment expenditure on GDP is

determined through a change in labor as both public and private capital are relatively fixed. The impact depends mainly on how public expenditure interacts with the real and nominal rigidities present in the economy.[11] By contrast, production coefficients determine the impact of public investment expenditure in the long term as the medium to long-term impact of public investment is transmitted through supply mechanisms.

The final good sector combines the labor aggregate ($L_{Y,t}$), intermediate goods ($x_{m,t}$) and public capital ($K_{G,t}$) through a Cobb-Douglas production technology, subject to overhead labor costs (FC_L) and fixed costs (FC):

$$(12) \quad Y_t = (L_{Y,t} - FC_L)^{\alpha}\left(\int_0^{A_t} x_{m,t}{}^{\theta}\, dm\right)^{\frac{1-\alpha}{\theta}} K_{G,t}{}^{1-\alpha_g} - FC,$$

where θ is the elasticity of substitution between intermediate inputs and a and a_g are production coefficients. The latter rules the impact of public investment on final output in the long run.

The stock of public capital is fueled by public investment (I_t^G). Formally, the public capital stock evolves according to the following motion law:

$$(13) \quad K_t^G = \frac{1}{4}\sum_{i=1}^{4} I_{t-n}^G + (1-\delta^G)K_{t-1}^G.$$

The evolution of the public capital stock considers its depreciation (δ^G) and its gradual implementation according to a *time-to-build process* (Leeper *et al*., 2010; Ramey, 2020).

In the context described above, everything equal, an increase in public investment has a direct impact on the potential output. However, it also has an indirect effect. A larger stock of public capital increases the productivity of other factors, encouraging companies to hire more workers and increase private investment.[12]

The direct impact of public investment, given the formalization introduced, crucially depends on the elasticity of output to the public capital stock ($\varepsilon_{Y,K^G} = 1 - a_g$) and the accumulated stock (K_t^G). Formally, the impact is given by the following expression:

$$(14) \quad \frac{\partial Y_t}{\partial K_t^G} = \varepsilon_{Y.K^G}\frac{Y_t}{K_t^G}.$$

[11] The impact of public investment on macroeconomic variables in the short term depends mainly on how public expenditure interacts with the real and nominal rigidities present in the economy (see Ramey, 2020).

[12] A change in the stock of public capital has a positive impact on capital and labor productivity to the extent that the direct effect is positive ($\partial Y_t/\partial K_t^G > 0$).

The direct effect of public investment, given the production function, will therefore depend negatively on the initial public investment stock (higher the initial stock, the lower the marginal increase effect of investment) and positively on the elasticity of output relative to the public capital stock.

The elasticity of final output to the stock of public capital at aggregate level is quite variable and depends on the type of public investment considered. Our calibration follows the detailed meta-analysis of Bom and Ligthart (2014), according to which public capital has a mean output elasticity of 0.12. This value is higher for core (high efficiency) public capital, with an elasticity of 0.17. High-efficiency investments are those aimed at the construction of roads, motorways, airports, water systems (core infrastructure) and, more generally, to investments directly and indirectly linked to the production activities of the various economic sectors. Additionally, we consider a value of the output elasticity equal to 0.07 when public capital accumulates through low-efficiency investments.[13]

It is worth mentioning here a series of issues related to the calibration of the elasticity of output to public capital. First, the elasticities considered in the literature are average values which reflect industrialized economies. The use of specific values for Italy, based on ad-hoc empirical studies, would contribute to a more precise quantification of the effects of short- and long-term public investment. In this case, the elasticities should be built up considering the composition of public investment and its regional location. Second, measuring the stock of public capital is another problematic aspect. The existing data are not of good quality and the approach followed is therefore to induct backwards, i.e., the stock is reconstructed from the public investments observed or an average of these. In very simplified terms, given the average value observed over a certain period for investment (I^G), the stock of public capital will be equal to $K^G = I^G/\delta^G$. Given the variability from public investment, the average value observed in the long term can be used for calibration. A calibration based on the average share of investments is consistent

[13] Our assumptions are in line with European Commission (2020), where average, high, and low-efficiency investment are associated to output elasticities equal to 0.12, 0.17, and 0.07, respectively. A value equal to 0.17 for core infrastructure is used also in the IMF (2014). A slightly different calibration is contained in in 't Veld (2016) where elasticities equal to 0.09 and 0.17 are associated to an average and a high-efficiency scenarios, respectively.

with the stationary properties of the model.[14]

Finally, it should be noted that the multipliers of public investment are influenced by several other factors. Specifically, in our model, the impact multiplier of public investment tends to decrease with the degree of openness of the economy due to the positive impact on relative prices and, consequently, on international trade. A coordinated stimulus at European Union level tends to eliminate these effects, favoring the positive impact of public investment on GDP.[15]

3.6 Government current expenditures and monetary policy setup

The government and the central bank respectively manage fiscal and monetary policies. The systematic component of public policies is modelled according to simple rules, assuming that in steady state government consumption (G_t) government investment (I_t^G) and transfers are proportional to GDP, while unemployment benefits (BEN_t) are indexed to wages and consumer prices. As partially outlined in the previous sections, government also provides subsidies (S_t) on physical capital and R&D investments in the form of tax-credit and depreciation allowances:

$$S_t = t_{t-1}^k\left(\delta^K P_t^I K_{t-1}^i + \delta^K P_t^I A_{t-1}^i\right) + \tau^K P_t^I J_t^i + \tau^A P_t^A J_t^{i,A} \quad (15)$$

where t_t^k are taxes on capital, P_t^I and P_t^A are the tangible capital and R&D price deflators respectively, while τ^A are tax credit on R&D investment.

On the revenues (R_t^G) side government collects resources through taxes on consumption, capital, and labor income. Accordingly, government debt (B_t) evolves according to the following equation:

[14] It should be noted that this compensates for a mismatch between model calibration and national accounting data (where the share of public investment is that observed in the current year and not the average). In this case, to report the data to the national accounts, a proportional correction would be required to take account of the deviation between the average and observed value.

[15] As previously mentioned, the model includes semi-endogenous growth and the possibility to introduce exogenous shocks to intangible investments in R&D through tax credits and wage subsidies. However, incentives to intangibles would generate a skill trade-off, as high skilled workers would move from production to R&D inducing a reduction of GDP in the short term. Given the nature of the measures under analysis, which do not imply workers reallocation but productivity improvements, we consider incentive to simulate R&D investments simply as public investment or incentives to private investments, with positive short-term demand effects and long-term supply-side improvements.

(16) $B_t = (1 + r_t)B_{t-1} + P_t^C(G_t + I_t^G) + TR_t + BEN_t + S_t - R_t^G - T_t^{LS}$,

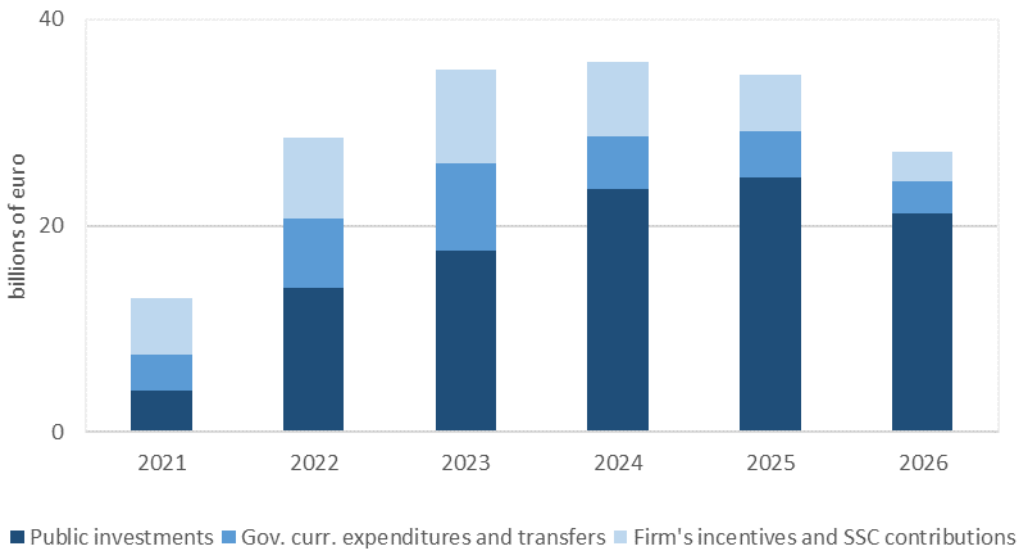
where T_t^{LS} are lump-sum taxes. Increases in government consumption are introduced into the model by simply adding an erogenous i.i.d. shock to the endogenous variable G_T.

Finally, the European Central Bank adopts a Taylor-kind rule; thus, the monetary authorities respond to changes in expected inflation and output gap at the EU level.

4. Macroeconomic impact of the Plan

The transposition of the Plan into the model is the crucial part of our exercise and our results must be read in the light of the model assumptions. As previously mentioned, the planned expenses are mapped in the five different categories previously described by using granular data on each single measure. Figure 1 reports our assumption about the distribution and timing of the NRRP additional funds over the period 2021-2026 which is the time-horizon of the official Plan and the period where the Government plans to spend the resources stemming from the NGEU programs and most of the resources of the Complementary funds.[16]

Figure 1 – Italian NRRP, additional resources allocation, €billion



Note: The figure reports the annual additional NRRP resources allocation by broad categories over the period 2021-2026 in €billions. Figures might differ from official statistics due to modelling definitions.

[16] Minor NGEU resources allocated to 2020 are assumed to have effects on 2021, while €9.5 billion from the Complementary funds are allocated to the years 2027-2030.

Most of them are allocated to the financing of public investments (62%). The remainder funds are allocated to encourage private investments (19%), reduce tax contributions on labor (2%), to current public expenditures (12%), and transfers (5%) to households.[17]

To account for the positive spillovers stemming from the NGEU program, we assumed that RRF grants allocated to other EU countries are used for average-efficiency public investments over six-years with a constant path of spending.

We also assume that the European Central Bank responds according to a standard Taylor rule. While we do not expect the ECB to increase rates in the first periods of the simulation, we cannot exclude a slowdown of other QE policies. This would be captured by an increase in the interest rates in the model, which would partially move as a shadow rate. Moreover, leaving the ECB standard (Taylor) rule reaction function allows to produce conservative estimates in the short run.[18]

We assumed a reduction of debt financing costs for obligations arising from RRF-loans-financed measures. To take into consideration the different impact of grants- and loans-financed measures on public finance variables, grants-financed measures were deducted through the introduction of an exogenous variable on the deficit and debt equations. These latter assumptions have no significant impact on the macroeconomic variables that we will later discuss.

The key assumption underlining the NRRP simulations is that all public investments contained in the Plan are those with high efficiency. Accordingly, we use an elasticity of GDP to public capital ($1 - a_g$) equal to 0.17 for the reference simulations (see Section 3.5).

It is worth noticing here that the simulation does not consider the impact stemming from structural reforms. However, most of the current expenditures considered and, to a lower extent, public investments are linked or directly finance the reforms described in the NRRP.

Our results are summarized in Table 2, reporting the impact evaluation of the

[17] The allocation of the total resources in the five categories might differ from official statistics due to model's requirements.

[18] A study of the optimal policy mix is beyond the scope of the present paper.

NRRP on selected macroeconomic variables over the period 2021-2026, the expected time-horizon of the Plan. GDP grows steadily over the period under analysis and is estimated to be 3.4% higher in 2026 compared to a no-policy change baseline scenario. The positive impact on GDP over the first three years is driven by a strong increase in total investment, while at the same time is dampened by the slowdown of consumption and exports.

The negative impact on private consumption can be explained following the logic of the model. The massive increase in public investment increases the expected returns on capital investments. Consequently, Ricardian households tend to reduce consumption to save and invest in the first periods, in view of higher levels of consumptions in the future. This reduction in consumption could be partially avoided assuming a more expansionary stance of the monetary authority, assumed to follow a standard Taylor rule for the motivations previously outlined.

The negative dynamic for exports is due to the inflationary pressure on the prices of exported goods. The NRRP increases the demand for investment goods with positive effects on the costs faced by firms, which are also rebated on export prices. The improvement in the terms of trade has negative effects on the dynamic of exports in the first periods, where demand-side effects prevail. In the medium term, however, the accumulation of public capital, a factor of production, improves the supply capacity of the economy, posing a negative pressure on firms' costs and exports prices. As it is clear from Table 2, the supply-side effect prevails in the medium term. In 2026, exports are 2.3% higher with respect to a no-policy change baseline scenario. This is not enough, however, to avoid a deterioration of the current account.

It should be noted that the Plan under analysis does not fully consider the spillover effects from the implementation of NRRPs in other countries.[19] In the latter case, the increase in foreign demand would set a stronger positive pressure on exports also in the short term, possibly compensating the described deterioration of the current account.

[19] See Pfeiffer *et al.* (2021).

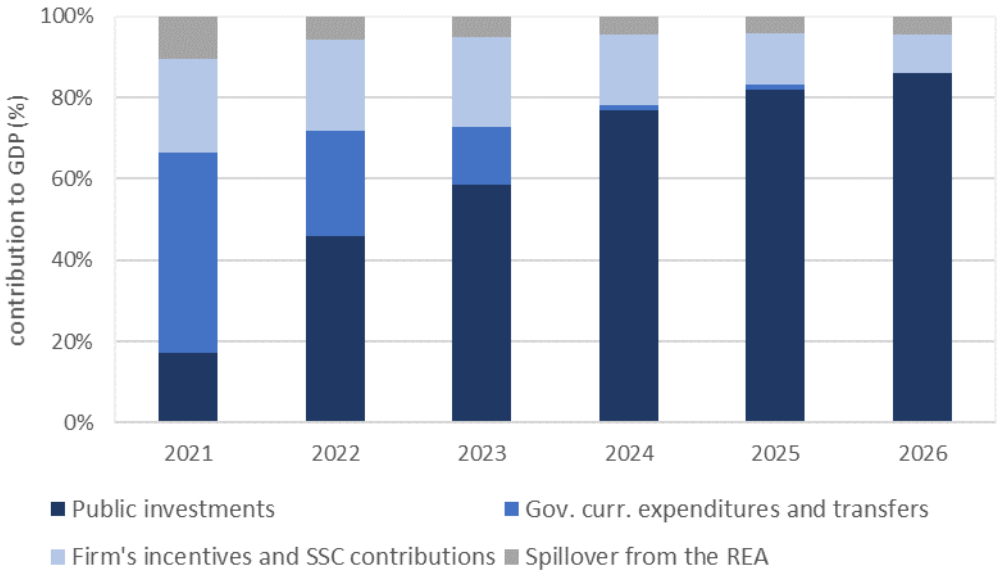
Table 2 – Impact of the NRRP on selected macroeconomic variables

	2021	2022	2023	2024	2025	2026
GDP	0.5	1.0	1.4	2.1	2.8	3.4
Private consumption	-0.4	-0.7	-0.5	-0.1	0.7	1.6
Total investment	2.9	7.0	8.4	10.9	11.7	11.0
Import	0.2	0.8	1.4	2.2	3.1	3.8
Export	-0.1	-0.4	-0.2	0.4	1.3	2.3

Note: This table reports the impact evaluation of the Plan on selected macroeconomic variables. Results are annual percent deviations from a no-policy change (baseline) scenario.

To better understand the previous results, Figure 2 reports the relative contribution of the different NRRP policy measures on GDP. We consider the five transmission channels introduced in Section 2, grouped into three main categories; moreover, we consider the spillover arising from public investment in the REA.

Figure 2 – Relative contributions to GDP by policy measures



Note: The figure reports the relative contribution of the different policy measures on the GDP deviation from the no-policy change (baseline) scenario. The transmission channels considered are public investments, incentives for firms' investments, reductions of SSC contributions on labor, government current expenditure, government transfers, and spillovers from public investment in the rest of the euro area.

During the first two years, the contribution to the simulated GDP deviation from the baseline is distributed across public current expenditures and investment as well as incentives to firms. Moving forward, public investment becomes the main

channel behind the GDP dynamic, followed by a decreasing but persistent role of firms' incentives. A rather limited and steady role stems from the positive spillover effects produced by investments in the REA.

The results of our simulations hinge on the assumption that the stock of public capital has a high efficiency with respect to output. To investigate the uncertainty surrounding our findings, Table 3 reports the result of the same simulation considering two additional scenarios. Following the discussion in Section 3.5, the first is an "average" scenario, where we consider investments with an efficiency with respect to GDP corresponding to the average estimate found in the empirical literature. The second is a "low" scenario, in which public investments with lower effectiveness are financed, i.e., those with a lower impact in terms of potential GDP growth.[20]

As previously outlined, in the model the scenarios differ in terms of the elasticity of final output to the stock of public capital, which is assumed to be 0.12 in the average scenario and 0.07 in the low scenario (in the reference "high" scenario is 0.17.) Investments associated with the low scenario might include projects that involve an unproductive dispersion of the resources allocated to investment. This occurs, for example, when there are errors in the selection, planning, and implementation of investments. In the latter case, the initial demand effect is not followed by significant long-term effects on the potential growth of the product. This category might also include investments that suffer major delays in their implementation, where projects become obsolete due to the delay in their implementation.

During the first and second year, the impact of public investment is similar in the three scenarios. As already outlined, in the short term, the effects of investment primarily depend on their impact through aggregate demand, which is broadly equivalent across different scenario. The efficiency of public investment, on the other hand, plays a key role in the medium term: the differential in the level of real GDP in

[20] The impact of public investments is subjected to a great uncertainty as this depends on the kind of the investment, its implementation design, and the institutional framing conditions (see, among others, Albrizio and Geli, 2021; Avellán *et al*., 2021; Cacciatore *et al*., 2021). Focusing on multipliers of ERDF spending, Canova and Pappa (2021) provide, e.g., recent evidence on great country and regional heterogeneity.

the final year of the simulation compared with the baseline no-policy scenario is equal to 1.8% in the low scenario compared with 3.4% when high-efficiency investments are assumed.

Table 3 – Impact of the NRRP on GDP, different public capital efficiency

Efficiency	2021	2022	2023	2024	2025	2026
High	0.5	1.0	1.4	2.1	2.8	3.4
Average	0.5	1.0	1.2	1.7	2.2	2.6
Low	0.5	0.9	1.0	1.3	1.6	1.8

Note: This table reports the impact evaluation of the Plan on real GDP, conditional on different public capital efficiency. The output elasticity of public capital is equal to 0.07 in the Low scenario, 0.12 in the Average scenario, and 0.17 in the High scenario. Results are annual percent deviations from a no-policy change (baseline) scenario.

Similar conclusions to those stemming from Table 3 are reached if these results are analyzed from a different perspective, namely calculating the cumulative multiplier of the measures in 2026, the end-year of the program. The latter is defined as the summation of the year-by-year GDP deviation from baseline over the period 2021-2026 and the same summation for the NGEU funds (Ramey, 2020). The use of a cumulative multiplier as a synthetic measurement of the impact of the Plan has the advantage of capturing the dynamic medium- and longer-term effects of investments.[21]

At the end of the simulation horizon, the cumulative multiplier is equal to 0.7 in the low scenario, 0.9 in the average scenario, and 1.1 in the high one. As expected, variations in the output elasticity to the capital stock parameter significantly affects the returns from public investments and the cumulative multipliers. It follows that, as already emerged in the current debate, much of the success of the NRRP is connected to the policymakers' ability to select, design, and implement the public investment programs. [22]

[21] The same definition is contained also in Pfeiffer *et al.* (2021), where authors also look at longer-term horizons.

[22] See, e.g., Alcidi *et al.* (2020) for a discussion on the risks related to the implementation of large investment plans.

5. Distributional impacts

The NNRP unquestionably contributes to the growth of the Italian economy in the coming years. However, the positive effect on GDP might hide heterogeneous and possibly adverse dynamics across income earners and categories. Against this background, this section investigates the impact of the Plan on different income categories through the analysis of the model-based functional distribution of income.[23] The methodology is borrowed from Roeger *et al*. (2021), who focus on the distributional impact of labor market reforms.

5.1 Impact by income category and income share

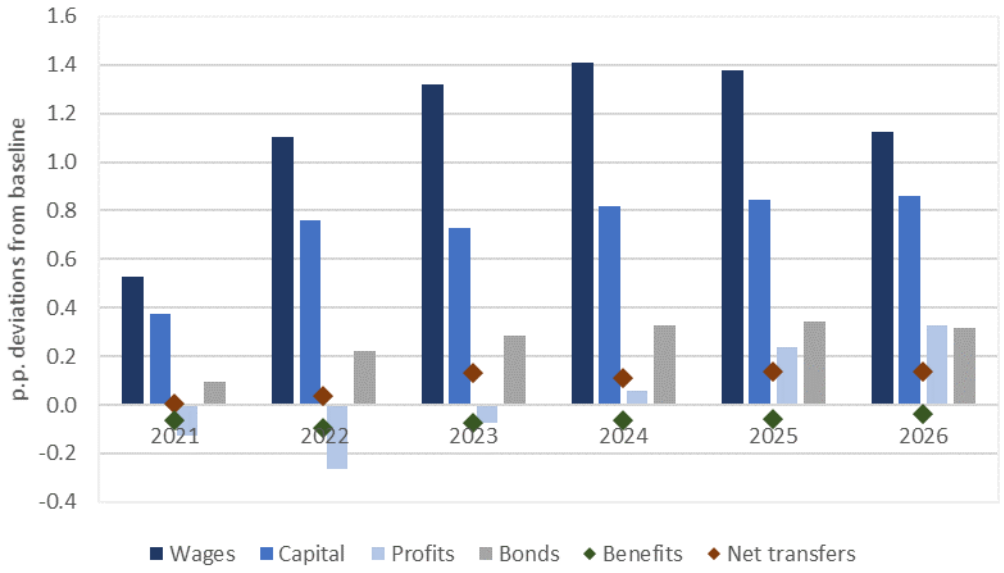
As outlined in Section 3, households in the model receives income from labor, capital, profits, financial wealth, unemployment benefits, and transfers. Accordingly, we analyze the impact of the Plan on these income categories both in absolute terms and in terms of relative share of National Disposable Income (NDI).[24] Our results are described in Figure 3, 4, and 5.

Figure 3 reports the impact of the Plan on the income categories with respect to the no-policy change scenario, in p.p. of GDP. Incomes from capital, labor, and financial wealth appear to be mainly driven by demand factors; therefore, they roughly follow the total expenditure path, which steadily increases in the first years.

[23] The epidemics of the last two decades have been always followed by increases in inequality (IMF, 2020; Furceri, 2020; 2021). Therefore, the impact of the Plan on the distribution cannot be ignored, even if, in this context, within the limits of the functional distribution of income.

[24] The model-based NDI is defined as the sum of net income from labor, capital, profits, financial wealth, and government transfers.

Figure 3 – Impact by income category, change in absolute values, p.p. of GDP



Note: This figure shows total net income from wages, capital, profits, bond, government benefits and transfers. as p.p. of GDP deviation from a no-policy change (baseline) scenario.

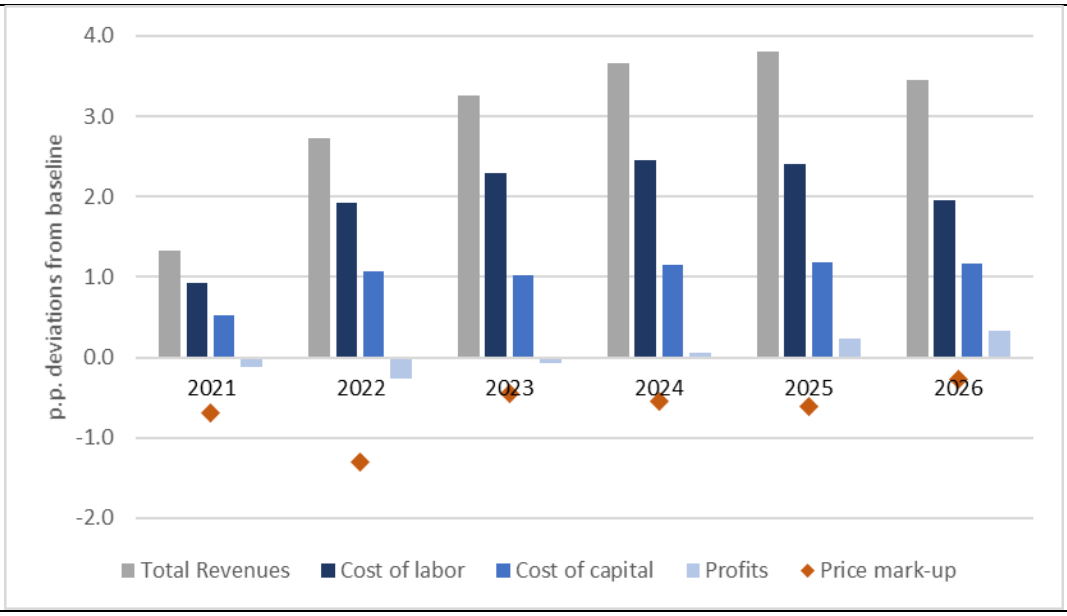
Interestingly, profits decline in the early years, driven by the increase of labor and capital income, which everything equal are negatively correlated with profits. This result is reversed in the last three years, where profits move above their initial level following the increase in GDP and productivity enabled by the accumulation of public and private investment. Finally, the dynamic of net transfers simply follows our assumptions on the disbursement timing. As expected, unemployment benefits fall over the period under analysis, following the overall improvement in economic activity.

To better understand the drivers behind the dynamic of profit, in Figure 4, we decompose it in the following three components: total revenues, (minus) the cost of labor and capital.[25] Moreover, we also report the price mark-up dynamic which final firms

[25] Formally, profit income is the sum of profits from final, intermediate, and R&D sector. Following Roeger *et al*. (2019), profit income can be expressed in compact form as $P_t^Y Y_t - W_t L_{Y,t} - P_t^x K_t + (1-\lambda) P_t^A \Delta A_t$, where P_t^Y and P_t^x are output and intermediate prices, W_t the aggregate nominal wage, and λ the elasticity of R&D production with respect to the number of researchers. The four blocks in the equation can be described as total revenues from final good sector, gross wages, the stock of capital priced as intermediate goods, and profits from the R&D sector. At the cost of oversimplifying, in the text we refer to $P_t^Y Y_t + (1-\lambda) P_t^A \Delta A_t$ as total revenues, $W_t L_{Y,t}$ as the cost the of labor, and $P_t^x K_t$ as the cost of capital.

charge over their marginal costs.[26]

Figure 4 – Impact on profits, profits' components, and price mark-up, p.p.



Note: This figure shows total net income from profits and its components (total revenues, cost of labor, cost of capital). as p.p. of GDP in deviation from a no-policy change (baseline) scenario. Price mark-up is expressed as p.p. from a no-policy change (baseline) scenario.

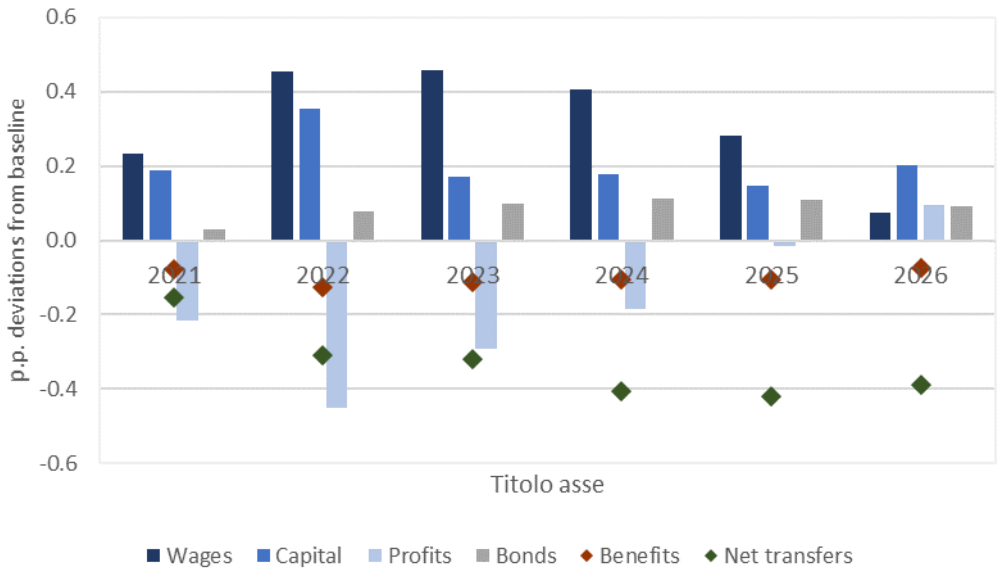
The evolution of revenues and costs seems to explain the overall dynamic of profits. In the first three years of the Plan, the increase of revenues is not enough to cover the increasing costs of labor and capital, driven by increasing wages, employment, capital stock, and interest rate, while the contrary is true from 2024 onwards. The price mark-up is constantly below its baseline value, with negative deviations between 0.7 and 1.3 p.p. The negative impact on price mark-up arises from the inflationary pressure of the plan and the fact that because of adjustment costs a fraction of firms is not able to index its prices to the expected inflation.

To complement the previous outcomes, Figure 5 reports the change in the income shares of NDI following the implementation of the Plan. It shows that in the first periods under analysis, the policy measures mainly favor those categories earning their income from labor and capital, while they depress the share of total profits. Instead, at the end of the Plan, the impact on the shares is rather homogenous. Here, the decrease in the income

[26] Fluctuations of the price mark-up are due to price adjustment costs and the partial indexing of prices to inflation. See Roeger *et al.* (2008), Section 1.2.1 on this point.

share of government transfers and benefits are evenly distributed across the income categories, with improvements comprised in a range that goes from 0.1 p.p. for wages and 0.2 p.p. for capital. The success of the Plan finally reallocates income from non-productive to productive activities reducing the relative weights of fiscal transfers and benefits.

Figure 5 – Change in income shares, p.p. of NDI



Note: The figure shows changes of income shares with respect to NDI as p.p. deviations from a no-policy change (baseline) scenario.

5.2 Impact on liquidity-constrained and non-liquidity-constrained households

As outlined in Section 3.2, households in the model are of two types: Ricardian households have access to financial markets, accumulate physical capital and can thus smooth their consumption over time. On the other side, liquidity-constrained households do not have access to financial markets, and they simply consume their current income stemming from labor net of taxes, unemployment benefits, and transfers. From a policy perspective, it is of great interest to understand the differential impact of the Plan on these two classes of households. Consequently, Table 4 reports the dynamic of consumption of the two groups together with the aggregate consumption (as reported in Section 3.2, Table 3), which is simply a weighted average of the first two groups.

Table 4 – Impact on liquidity- and non-liquidity-constrained households

Private Consumption	2021	2022	2023	2024	2025	2026
Aggregate	-0.4	-0.7	-0.5	-0.1	0.7	1.6
Liquidity-Constrained	0.1	0.2	0.6	1.0	1.6	2.1
Non-Liquidity-Constrained	-0.6	-1.2	-1.1	-0.6	0.2	1.3

Note: This table reports the impact evaluation of the Plan on (aggregate) private consumption, private consumption of liquidity-constrained households, private consumption of non-liquidity-constrained households. Results are annual percent deviations from a no-policy change (baseline) scenario.

As expected, the reduction of aggregate consumption registered in the first periods of the plan is due to the consumption smoothing of Ricardian households, which chose to save and invest during the first years of the Plan to capture a share of the expected increases of (future) capital income. On the contrary, the dynamic of liquidity-constrained households roughly follows the time allocations of public funds.

Moving to the income properties for the two types of households, it is useful to recall here that both liquidity-constrained and non-liquidity-constrained households offer low-, medium-, and high-skilled labor services in the model. Consequently, the income gap between different kind of households is not affected by heterogeneities in skill-specific-wages. On the contrary, what drives the income gap in the model are the different sources of income. As previously shown in Figure 5, the Plan has a positive impact on income from profits, capital, and bonds, which are a source of revenues for the Ricardian, but not for the liquidity-constrained households.

It is important to underline here that the latter result is mainly a by-product of the model characteristics and simulations assumptions rather than the actual impact of the Plan on the two types of households. First, households' characteristics in the model are (necessarily) simplified and do not map one-to-one to the distribution of income and skills in the actual economy; second, the model does not allow to target the NRRP measures to different group of households, while actual policies often target the most economically (and socially) vulnerable people. Third, structural reforms, not considered in this exercise, have often the objective of supporting vulnerable groups.

As final caveat, the current model setup does not allow to analyze the impact of the plan on the distribution of income but only on the functional distribution between different income categories. A possible way forward to assess this important point would

be to use the QUEST output to feed microsimulation or micro-econometric models.[27] We leave the exploration of this to future research.

6. Conclusions

In this paper, we assessed the NRRP impact on the Italian economy. Using granular information available at the Italian Ministry of Economy and Finance, we mapped the Plan onto a large dynamic stochastic general equilibrium model built to capture the transmission channels associated to the NRRP instruments. By using Italy as case study, we concentrate on the effects of national fiscal measures, complementing somehow the existing literature that focuses on aggregate data or spillovers with simplified expenditure assumptions.

Our results showed a sizable impact for the NRRP. The Plan involves in the medium term a GDP growth between 1.8 and 3.4 per cent depending on the efficiency of public investment. In the short run, GDP growth is driven by aggregate demand, while in the long run the NRRP boosts the productivity and GDP through the build-up of the public capital stock. The magnitude and persistence of the effect depend on the efficiency of public investment financed, i.e., how much public investments financed contribute to the development of infrastructures that internalize production externalities. In this respect, the NRRP challenge the country institutional capacity to select and execute viable and productive public projects.

We find that the impact of the Plan on the functional distribution of income is adverse for profits in the early years of the Plan. They decline because of the increase in labor and capital demand. A trade-off emerges between wages, capital, and bond that increases at the expense of profits. In the medium term this trade-off disappears, as the increasing fiscal stimulus allows a generalized increase of income. When GDP increases, profits move above their initial level.

As a final word of caution in evaluating the realism of the simulations it is worth noting that it is necessary to consider various structural factors that influence the effectiveness of public investments. Various studies agree, e.g., on the positive relationship between the efficiency of public administrations and the stock and quality of public capital. The timing, effectiveness and sustainability of public

[27] See, e.g., Barrios *et al*. (2017) on this point.

investment depend substantially on the regulatory regime and its implementation. The effectiveness of public investment also requires strong coordination between different levels of government. In Italy, investments by local authorities account for well over half of public investments.

In the above respect, the appropriate *scenario* for the simulation depends not only on the type of investments selected, but also (if not mostly) on the context in which they will be made. Creating the conditions for the success of a vast investment Plan is one of the key challenges that Italy will face. It is on this ground that the planned structural reforms would play a crucial role. However, an investigation of these factors is beyond the scope of the present paper.

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