

Beetsma, Roel; Buti, Marco

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DESIGNING CONDITIONALITY IN THE SUPPLY OF EUROPEAN PUBLIC GOODS

ROEL BEETSMA AND MARCO BUTI

The European Union will need in the coming years to invest a substantial amount of resources in European public goods (EPGs), including for the digital and climate transitions, and for defence and security. Funding for this could be provided in a centralised way at EU level, via either a fund or from the EU budget, but for this to be politically viable, and to create the necessary trust, national budgetary policies need to comply with the common EU fiscal rules. Setting adequate conditions for access to central financing is, however, not straightforward. The tightness of the conditionality needs to balance the desirability of a country pursuing sound fiscal policies with the need to deliver on the provision of EPGs that benefit several or all EU countries. The optimal tightness should reassure fiscally-conservative countries that EU money would not result in opportunistic behaviour that results in less discipline at national level. More fiscally fragile countries should be reassured that their fiscal retrenchment efforts will be duly rewarded.

Roel Beetsma (r.m.w.j.beetsma@uva.nl) is Dean of the Faculty of Economics and Business, University of Amsterdam

Marco Buti (marco.but@eui.eu) is a Non-resident Fellow at Bruegel and Tommaso Padoa-Schioppa Chair at the European University Institute

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1 Introduction

In the coming years, the European Union will be confronted with unprecedented needs for public (and private) investment in the digital and energy transitions. In addition, countries must step up spending on defence. A large fraction of these expenditures will benefit more than one member state and may even benefit the whole EU. However, the cross-border benefits of the investments lead individual countries to insufficiently internalise the full benefit of these investments. Moreover, it would make little sense to do many of the investments at national level only – for example because they form part of a larger infrastructure that can only be usefully rolled out for groups of countries. Hence, there is a subsidiarity argument for financing, and possibly coordinating, these investments at EU level.

These new investment needs have emerged in an era in which public budgets in EU countries are under pressure. Public debts have risen as a result of the support provided in the context of the COVID-19 pandemic and the invasion of Ukraine by Russia, causing energy prices to jump and defence spending to go up. At the same time European populations are ageing, causing upward pressure on pension and healthcare spending.

The investments mentioned here form part of a broader set of European public goods (EPGs). Proposals for EPGs in the area of climate and the energy transition were made by Garicano (2022), who suggested creating a European Climate Investment Facility with access made conditional on adherence to the EU fiscal rules, Abraham *et al* (2023), who proposed a €500 billion EU Climate and Energy Security Fund, and Pisani-Ferry *et al* (2023), who advocated an EU energy and climate governance framework to accompany the European Green Deal.

Elsewhere, we have presented the case for a successor fund to the NextGenerationEU post-pandemic recovery instrument, that would be aimed at financing EPGs – goods that benefit multiple countries or the entire EU, and access to which requires compliance with the EU fiscal rulebook (see Bakker and Beetsma, 2023; Bakker *et al*, 2024).

This paper studies the consequences of placing conditions on access to sources of central financing. Proper design of conditionality is a non-trivial issue. Overly-tight conditionality smothers new EPG initiatives, while insufficient conditionality undermines the political appetite of a substantial fraction of EU countries for the collective financing of EPGs. Non-excludability of the EPG is also an important factor determining optimal conditionality. The more non-excludable an EPG is, the more there is a common interest in its provision and the less tight conditionality should be, and vice versa. However, even without excludability, requiring adherence to the fiscal rulebook is warranted, because countries have a common interest in a lack of fiscal discipline not leading to adverse spillovers via the financial markets.

Conditionality is an important element in obtaining political support for EPGs from countries that do not trust other countries to spend collective resources well. In addition, there is the '*juste retour*' motive of some countries that the financing of EPGs should not lead to a redistribution of resources (eg Mourlon-

Druol, 2024), while countries may also object to an increase in the overall fiscal burden. However, those EPGs that are desirable from a collective perspective would overall benefit each EU country, provided the contribution to its provision is adequately shared with an appropriate design of conditionality. In addition, EPGs may substitute for national public-good provision, inducing a shift from national to EU financing. When there are economies of scale in their provision, the overall fiscal burden would in fact be reduced. To the extent that the provision of public goods at the national level is too low, provision of EPGs could lead to an overall increase in the tax burden, but that would then be accompanied by a positive welfare effect. Likewise, a particular EPG could be a valuable addition to an existing range of public goods, thereby raising welfare, even though the overall tax burden rises.

The remainder of this paper is structured as follows. In section 2, we outline the challenges to be faced in addressing the conditionality issue. In section 3, we develop a formal model of ‘frugal’ and ‘profligate’ countries to better spell out the different incentives involved in the design of conditionality. Section 4 draws the broader policy lessons and section 5 concludes.

2 Funding EPGs and conditionality

Economic policies in the EU are still largely in the hands of the national governments and, therefore, mostly domestically-oriented, despite the substantial financial and economic integration of the economies and the fact that many initiatives can be delivered more cheaply and more effectively at EU level. Despite being financed with EU grants and loans, and notwithstanding initial European Commission attempts to align them more towards priorities for the EU as a whole, the plans developed in the context of NextGenerationEU (NGEU) are essentially geared towards national reforms and investments¹. For this reason, policies need to be fundamentally reoriented to deliver EPGs in both economic and non-economic areas.

By drawing on public economics, the theory of fiscal federalism and the institutional features of the EU, Buti (2023) and Buti *et al* (2023) identified six areas for EPGs: the ‘green’ transition and energy, the digital transition, the social transition, raw materials, security and defence, and health. These require substantial investments. According to European Commission (2022) estimates, in the first area alone, annual additional investment of about €520 billion would be needed up to 2030, while the digital transition requires an extra annual amount of €125 billion on top of this. Of these amounts, a quarter to one half needs to come from public investment.

Dorrucci *et al* (2024) calculated an *additional*, ie relative to historical averages, €5.4 trillion of spending for the period 2025-2031. This is the total extra cost of the green transformation, digitalisation and strengthening of military defence. About €1.3 trillion would need to come from public sources, of which about €400 billion could come from existing EU resources. This leaves a public funding gap of €900 billion for the EU as a whole. Accounting for the considerable uncertainty surrounding these numbers, this gap would amount to between 0.6 percent and 1 percent of EU annual

¹ Note that cross-border spillovers do take place to the extent that projects are executed by multinational corporations.

GDP. In a much-debated report on EU competitiveness, Draghi (2024) pointed to the need to collectively finance an increasing number of shared goals. He quantified the additional private and public investment at about €800 billion per year (Draghi, 2024).

Wyplosz (2024) applied the theory of fiscal federalism to evaluate some frequent proposals for EPGs. In trading off whether a public good should be provided at the national or the EU level, a number of criteria need to be weighed against each other (see also Claeys and Steinbach, 2024). Speaking in favour of EU-level provision are increasing returns to scale in the provision and spillovers. Speaking in favour of national-level provision are, in particular, heterogeneity of national preferences, better information provision at national level and more effective democratic control at national level. Based on the principle of ‘no taxation without representation’, one could also argue that a public good should be financed at the level where it is provided.

The EU/national classification of EPGs gives four possible configurations (Table 1).

Table 1: EPGs classification

		Delivery	
		EU	National
Financing	EU	‘Genuine’ EPGs	‘NGEU-type’ EPGs
	National	Projects financed by externally assigned revenue	Coordination of national activities

Source: Beetsma and Buti (2024).

The specific nature of an EPG may lend itself more or less to delivery at the EU level and for financing at the EU level. Here, we focus mostly on EPGs that are financed by the EU, but delivered at national level. An example would be high-speed railway between two or more countries that is (partly) financed by the EU, but delivered at country level. Financing or (co-) financing by the EU is essential to get such a project off the ground, because an individual country only partly internalises its full benefit. This would be best characterised as a project-type of EPG, which can be excludable to a certain extent. Another example would be a hydrogen infrastructure in which (initially) only a limited number of countries participate.

In Bakker *et al* (2024) we proposed a new fund to succeed NGEU². Such a fund would only finance public investments with positive cross-border spillovers, because these tend to be undersupplied as their full benefits are only partially internalised at the national level. It would be of a size roughly similar to NGEU. Each country would have its own earmarked part of the fund’s ‘envelope’. Access would be conditional on the country obeying the revised fiscal rulebook, that is, not being under an excessive deficit procedure (EDP), or being on track with the required correction of the excessive

² See also Age Bakker, Roel Beetsma and Marco Buti, ‘The Case for a European Public-Goods Fund’, *Project Syndicate*, 4 March 2024, <https://www.project-syndicate.org/commentary/public-goods-fund-could-finance-green-transition-and-ensure-fiscal-responsibility-by-age-bakker-et-al-2024-03>.

deficit, including the delivery of the agreed structural reforms. In other words, the Commission would deploy a 'performance-based' approach somewhat similar to that under NGEU³. Failure to deliver on these conditions would result in forfeiting the (remaining) allocated funds to the virtuous countries in the system.

The design of the conditionality would be essential for fiscal behaviour and the provision of EPGs. First, it needs to be legally well-founded. The conditionality could build on the conditionality regime installed for NGEU. That regime is based on the Conditionality Regulation (Regulation (EU) 2020/2092) intended to protect the financial interests of the EU⁴. It allows the EU to take measures to this end, for example suspending payments to countries that fail to respect the principles of the rule of law. The idea behind the regime is that, grounded in solidarity, the EU budget requires common resources to be deployed in a responsible way in line with countries' commitments to adhere to the values and obligations under the EU Treaty (Heinemann, 2018). Improper national judiciary or institutional arrangements, and an unwillingness to address such flaws, may trigger the application of the Conditionality Regulation. It applies to all EU funds, including those allotted to NGEU⁵.

Second, conditionality can only be properly exerted when it is based on variables that are observable and verifiable (in particular, whether cases can be brought to the EU Court of Justice). This issue is comparatively easy when it comes to assessing adherence to the fiscal rulebook. The new fiscal framework includes also provisions to assess whether the agreed reforms have been delivered.

Third, the design and tightness of the conditionality needs to be politically acceptable. This needs to be the case at the design stage, but also at all relevant moments of implementation, because EU finance ministers would vote on the European Commission proposals in which member state claims on the central budget are assessed.

We propose a redefined conditionality regime that links access to EU central financing to compliance with the revised Stability and Growth Pact (SGP) and the delivery of the structural reforms and investments that are part of the newly-introduced medium-term fiscal-structural plans. This would fit into the logic of the Conditionality Regulation that EU resources are used in compliance with the Treaty obligations, including the new economic governance framework. The fiscal conditionality we propose incentivises countries to pursue sound national fiscal policies and fulfil agreed reforms, thereby ensuring that they meet their financial obligations towards the EU, hence ensuring that the EU can

³ An assessment of this approach is found in Zeitlin *et al* (2023, 2024). See also Darvas *et al* (2023).

⁴ See https://commission.europa.eu/strategy-and-policy/eu-budget/protection-eu-budget/rule-law-conditionality-regulation_en. The Regulation enables the Commission to propose measures to the Council when a breach of the rule of law in a member state threatens the EU's financial interests.

⁵ In view of their rule-of-law situations, the conditionality regime was activated for Poland and Hungary, and approval of their national recovery and investment plans was suspended. On 16 February 2022, the Court of Justice of the EU dismissed their actions seeking annulment of the EU law 'on a general regime of conditionality for the protection of the Union budget' (Regulation 2020/2092). See Wahl (2022).

continue to borrow against the best possible conditions⁶. *A fortiori*, because central financing is intended for EPGs that improve growth potential itself, the proposed conditionality acts as a double-edged sword.

We now turn to a formal macroeconomic model to highlight some aspects of conditionality.

3 Analysing conditionality: a formal model

We analyse the role of EPGs and fiscal conditionality in the provision of EPGs in a three-actor model: two countries, in which one country is long-term oriented and fiscally disciplined and the other country is short-term oriented and fiscally undisciplined, and the European Commission. We could also view each country as a block of countries with similar policy orientations. Fiscal conditionality is motivated by the fact that EPGs are financed by EU resources. The specific way of financing EPGs and how the financing burden is distributed are left in the background for now. We discuss the possibilities later.

3.1 The model

We consider two representative EU countries: 'Frugal', indexed by 1, and 'Profligate', indexed by 2.

Potential output of country i is:

$$Y_i^* = \beta_i E + \gamma_i d_i, \quad \beta_i \geq 0, \quad (1)$$

where Y_i^* is potential output, E is the EPG, and d_i is the budget deficit in country i . The impact of the budget deficit on potential output depends on the quality of spending: therefore, the sign of γ_i can be positive or negative. It is positive if the deficit is mainly the result of spending on public investment, which boosts potential output. It is negative if the deficit is mainly the result of transfer spending and subsidies that disincentivise the buildup of productive capacity.

Actual output of country i is:

$$Y_i = \omega_i E + \theta d_i + \mu Y_j, \quad \theta > 0, \quad \omega_i, \mu \geq 0, \quad (2)$$

So actual output depends on domestic fiscal policy, the supply of the EPG and trade spillovers. A higher deficit boosts output in the short run, ie actual output, explaining why $\theta > 0$. The supply of EPGs is:

$$E = \hat{E} - \alpha(d_2 - \bar{d}), \quad \alpha \geq 0, \quad \bar{d} \geq 0 \quad (3)$$

where \hat{E} captures the maximum value of the EPG when there is full compliance with the rules. We assume that the conditionality applies only to the fiscal behaviour of Profligate as Frugal is assumed to always comply with the rules. Hence, α , which has always a non-negative value, captures the degree

⁶ Compliance with the new fiscal rule book protects the financial sustainability of national budgets, not only ensuring that countries continue to fulfil their obligations towards the EU, but also limiting the likelihood of a financial crisis that forces them to seek assistance from the EU budget in some way.

of conditionality on the deviation of the deficit in Profligate from the deficit \bar{d} consistent with the common rules. This implies that there is a ‘leakage’ of the deficit by the profligate country as its effect on output tends to be offset by the reduction in E due to the conditionality.

Parameter β_i indicates the extent to which the potential output of country i benefits from the EPG. That is, it indicates the long-run output effect of the EPG. By contrast ω_i captures the short-run demand effect coming from the production of the EPG. We refer to this parameter as the ‘physical content’ of the EPG. The settings of the parameters β_i and ω_i provide a characterisation of the EPGs in terms of the extent to which the countries benefit from them where they are produced – see Table 2, which also provides some relevant examples.

Table 2: Characterisation of EPGs with important examples

		Parameter β	
		low	high
Parameter ω	Low	Common agricultural policy	EU-wide reforms, such as internal market, capital markets union
	High	Cohesion funding	High-tech infrastructure

Source: Bruegel.

The common agricultural policy is an example with only limited effects on potential output and average demand, putting this in the cell with low β and low ω . An example of a case with $\beta_1 = \beta_2 > 0$, but low physical content, is EU-wide reforms⁷, such as the completion of the internal market and of the capital markets union⁸. To the extent that both countries are similarly export-oriented and similarly financially developed, β_1 and β_2 will be of comparable magnitude. An example of an EPG with a high physical content is high-tech infrastructure (eg for hydrogen transport) that is rolled out throughout the EU. Assuming that firms and workers throughout the EU contribute to a comparable degree to its construction, we have $\omega_1 = \omega_2 > 0$.

The long- and short-run effects of EPGs may differ between the countries, leading β_1 and β_2 to be different, respectively ω_1 and ω_2 to be different. An example is the case of national product or labour market reforms. Such reforms have an EPG character because they benefit other countries. For example, by boosting the economic performance in the country implementing the reform, they stimulate imports from other EU countries. Reforms in country i have a greater potential output effect in country i than in the other country, implying that $\beta_i > \beta_j$. Another example would be an air-defence system against a threat from Russia. Countries closer to Russia, such as Poland, would benefit more than countries further from Russia, such as Spain. The contribution of the air-defence system to potential output would likely be rather limited (ie β_1 and β_2 are modest), although it likely stimulates

⁷ Although the short-run demand effect of such reforms is small, by making countries more prosperous the long-run effect on demand will be positive.

⁸ Interestingly, capital markets union would facilitate the provision of other investment-type EPGs by facilitating the flow of private financing to EPGs that rely not only on public funding, but also on contributions by private financiers.

private investments by raising the safety of the investments and through R&D spillovers towards other industries. If EU countries contribute equally to its construction, ω_1 and ω_2 will be positive and equal. However, if the system is built by the US defence industry, ω_1 and ω_2 will be low, or even zero. A final interesting example are the traditional EU cohesion funds that are intended for the catching up of poorer parts of the EU. The physical content is high. *Ceteris paribus*, there will be a shift in demand from richer to poorer parts of the EU. To the extent that the cohesion funds include potential investments, they will also result in the catching up of potential output in poorer parts of the EU.

Next, we turn to government behaviour, which we represent via quadratic loss functions that are minimised by the choice of the deficit levels by the two countries. For the governments of Frugal and Profligate, who play a Nash game, they are

$$L_1 = (Y_1^* - \bar{Y}_1^*)^2 + \varepsilon(d_1 - \bar{d})^2, [4]$$

$$\varepsilon \geq 0$$

$$L_2 = (Y_2 - \bar{Y}_2)^2 + \delta(d_2 - \bar{d})^2, [5]$$

$$\delta \geq 0$$

In equations [4] and [5], \bar{Y}_1^* , \bar{Y}_2 and \bar{d} are, respectively, the targets for potential output in Frugal, actual output in Profligate and the deficit target in compliance with the rules⁹. The deficit target would correspond to the medium-term objective in the ‘old’ Stability and Growth Pact or the structural deficit that a country, by following its agreed spending path, is supposed to reach at the end of the medium-term fiscal-structural plan under the revised Pact.

We assume that Profligate has short-term preferences. Thereby, it chooses d with the aim of achieving a certain level of actual output. Instead, Frugal focuses on the long term: it sets d with the aim at boosting potential output. Both countries care about complying with the rules, but that priority is stronger in Frugal than in Profligate. Hence, $\varepsilon \geq \delta$.

Throughout, we simplify by setting $\theta = \delta = 1$. Under this assumption, we solve the model. Combining the actual output equations yields:

$$Y_i = \left(\frac{1}{1-\mu^2} \right) (\tilde{\omega}_i E + d_i + \mu d_j). [6]$$

where $\tilde{\omega}_i \equiv \omega_i + \mu\omega_j$. The demand impact of the EPG is magnified by the trade linkages between the two countries. Substituting the relevant expressions for potential output and actual output in the loss functions, and minimising with respect to the deficits, yields the reaction functions.

⁹ Under the old fiscal rules, \bar{d} would correspond with the country’s Medium-Term Objective that we here assume is identical for the two countries.

The reaction function of Frugal is:

$$d_1 = \left(\frac{\varepsilon - \alpha\beta_1\gamma_1}{\varepsilon + \gamma_1^2} \right) \bar{d} + \left(\frac{\gamma_1}{\varepsilon + \gamma_1^2} \right) (\bar{Y}_1^* - \beta_1 \hat{E} + \alpha\beta_1 d_2), [\gamma]$$

We assume that $\alpha\beta_1\gamma_1 < \varepsilon$, hence the direct effect of a higher \bar{d} on d_1 dominates the indirect effect running via the provision of EPGs, which in turn runs through the conditionality effect of \bar{d} on EPGs. The signs of the partial derivatives depend on the value of γ_1 , that is the effect of the budget deficit on Frugal's potential output. If $\gamma_1 > 0$, we have:

$$d_1^* = d_1 \left(\underbrace{\bar{d}}_{+}, \underbrace{\bar{Y}_1^*}_{+}, \underbrace{\hat{E}}_{-}, \underbrace{d_2}_{+} \right)$$

while all these signs switch if $\gamma_1 < 0$. Frugal's reaction function optimally balances two 'gaps', one between potential output and its target and the other between the deficit and its target. An increase in the potential output target leads it to raise its deficit to reduce the first gap, and so to restore the optimal trade-off between the two gaps. An increase in the maximum level of EPGs, \hat{E} , implies an increase in Frugal's potential output, hence approaching the target of potential output. This enables it to reduce its deficit, in order to restore the optimal trade-off between the two gaps. An increase in Profligate's deficit through the conditionality term negatively affects Frugal's potential output, hence leading to an increase in the latter's deficit, which helps restore the optimal trade-off between the gaps.

The reaction function of Profligate is:

$$d_2 = \left[\frac{(1-\mu^2)^2}{(1-\mu^2)^2 + (1-\alpha\tilde{\omega}_2)^2} \right] \bar{d} + \frac{(1-\alpha\tilde{\omega}_2)[(1-\mu^2)\bar{Y}_2 - \tilde{\omega}_2(\hat{E} + \alpha\bar{d}) - \mu d_1]}{(1-\mu^2)^2 + (1-\alpha\tilde{\omega}_2)^2} [8]$$

In the sequel we assume $\alpha\tilde{\omega}_2 < 1$. This assumption ensures that the direct impact of a change in the exogenous targets via d_2 is stronger than the indirect effect via the leakage of d_2 through the application of the conditionality. Proceeding under this assumption, we have that

$$d_2^* = d_2 \left(\underbrace{\bar{d}}_{+}, \underbrace{\bar{Y}_2}_{+}, \underbrace{\hat{E}}_{-}, \underbrace{d_1}_{-} \right)$$

The maximum level of EPGs, \hat{E} , features in the reaction function, capturing the demand channel of EPGs¹⁰: a higher \hat{E} raises actual output, allowing Profligate's government to scale back its deficit. Similarly, an increase in Frugal's deficit, which helps to raise Profligate's actual output level, allows it to lower its optimal deficit. A higher target for Profligate's output induces it to raise its deficit to reduce the gap with actual output, to restore the optimal balance between the relevant gaps. A higher deficit target

¹⁰ Only in the special case of $\omega =$

0, \hat{E} drops out of the reaction function of Profligate, which can then be written as $d_2^* = d_2 \left(\underbrace{d_1}_{-}, \underbrace{\bar{d}}_{+}, \underbrace{\bar{Y}_2}_{+} \right)$.

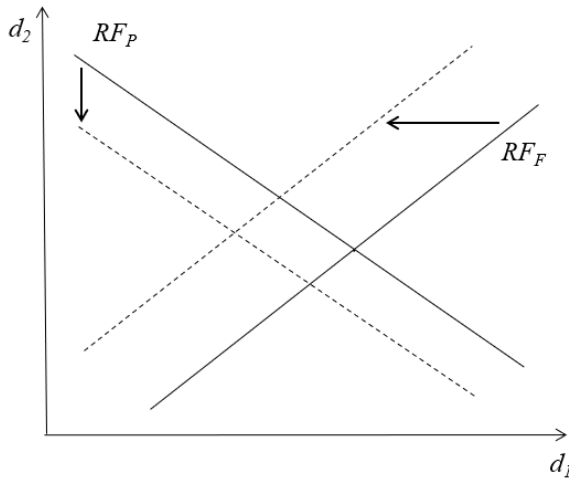
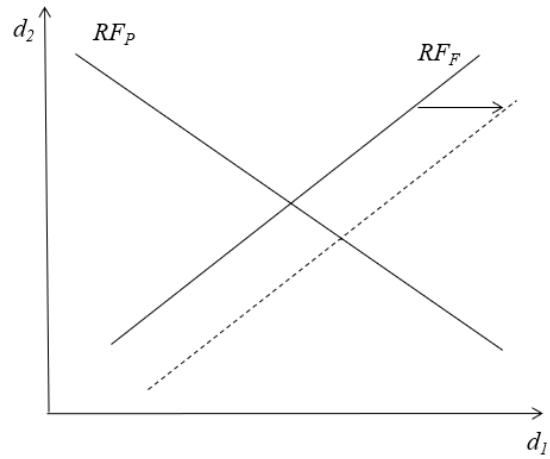
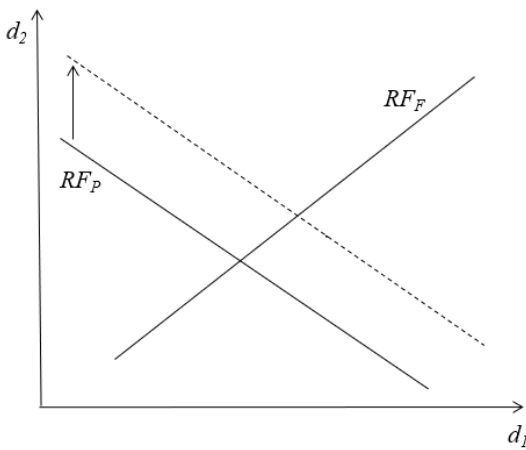
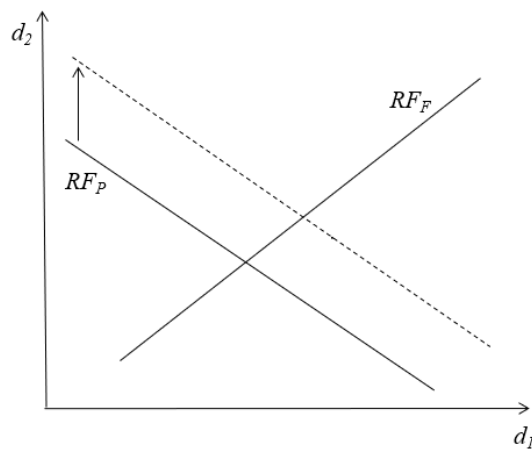
\bar{d} has two effects on the actual deficit. On the one hand, it makes it optimal to raise the actual deficit in order to maintain the optimal balance between minimising the gap between actual output and its target and the gap between the actual deficit and its target. On the other hand, it has a positive effect on the level of EPGs via the conditionality term in the expression for EPGs, leading to an increase in actual output in the direction of its target, implying the actual deficit can be reduced. Assuming the degree of conditionality α is not too strong, that is, assuming that $(1 - \alpha\tilde{\omega}_2)\alpha\tilde{\omega}_2 < (1 - \mu^2)^2$, the first effect dominates.

We observe that the multiplier in the first pair of square brackets of (9) is increasing in the degree of conditionality α as well as the value of $\tilde{\omega}_2$. Suppose we start from a situation in which the deficit is set so that the trade-off between the gaps with the targets is optimal, hence Profligate's government is on its reaction function. Now, consider an increase in the deficit target \bar{d} . That calls for an increase in d_2 as well as an increase in Y_2 , to restore this optimal trade-off. However, raising d_2 leads to the 'leakage effect' mentioned above, because part of the effect of the increase in d_2 on Y_2 leaks away via the conditionality term in expression (3) for the EPG. Hence, to attain a given increase in Profligate's output, d_2 has to be raised further than in the absence of conditionality, implying that the term in the first pair of square brackets in (9) is increasing in conditionality α .

To see the role of conditionality and physical content of the EPGs more clearly, let us for now assume that the cross-border demand spillovers are zero, ie $\mu = 0$. We observe that the derivative of d_2 with respect to \bar{d} is increasing in both α and ω , while the derivative of d_2 with respect to \bar{Y}_2 is decreasing in both α and ω . An increase in \bar{Y}_2 raises the gap with Y_2 , so calls for an increase in the latter, which in turn requires an increase in Profligate's deficit. A larger leakage effect requires a larger increase in d_2 to achieve a given rise in Y_2 , but this would come at the cost of a larger gap between d_2 and \bar{d} than without the leakage effect. The burden is shared between the two gaps by raising d_2 by less than in the absence of the leakage effect, which implies that the increase in Y_2 is less than in the absence of the leakage effect. Now, let $\mu > 0$ again. Reaction function (9) shows that Frugal can help Profligate by increasing its own deficit, thereby compensating for the leakage effect. The magnifying effect of leakage through conditionality on Profligate's deficit is also present for the other targets. Note further that an increase in the physical content ω of EPGs magnifies the leakage effect and, hence, strengthens the aforementioned effects on Profligate's deficit.

3.2 Comparative statics

This section presents the comparative statics for the above model. In line with the assumption that Frugal prioritises productivity-enhancing public investments and reforms instead of distortionary social spending, we focus on the case of $\gamma_1 > 0$.

Figure 1: increase in \hat{E} Figure 2: increase in \bar{Y}_1^* Figure 3: increase in \bar{d} Figure 4: increase in \bar{Y}_2 

Source: Bruegel.

An increase in the maximum amount of EPGs, possibly because of pressure during a crisis, brings Frugal's potential output closer to its target, allowing it to lower its own deficit for a given deficit in Profligate (Figure 1). At the same time, as shown in Figure 1, if the demand channel is active, ie $\tilde{\omega}_2 > 0$, the resulting higher actual level of EPGs brings actual output in Profligate closer to its target, allowing it to reduce its deficit (at given deficit in Frugal). Figure 1 cannot assign an unambiguous effect of the maximum amount of EPGs, \hat{E} , on Profligate's deficit. Substituting the reaction function of Frugal for that of Profligate and solving for the final solution of Profligate's deficit reveals that the overall effect of \hat{E} on Profligate's deficit is ambiguous. In fact, it is easy to show that with conditionality α sufficiently weak, and the physical content $\tilde{\omega}_2$ of EPGs sufficiently large, the effect is negative. With a sufficiently large physical content, a given \hat{E} goes a long way in bringing actual output towards its target and allows the deficit to be scaled back. An increase in Frugal's target for potential output \bar{Y}_1^* only shifts Frugal's reaction function to the right, leading to a higher equilibrium deficit in Frugal and a lower one in Profligate (Figure 2). Both an increase in the deficit target and in Profligate's target for actual output

lead Profligate to shift its reaction function upward, causing an increase in the equilibrium deficit of both countries (Figures 3 and 4, respectively).

3.3 The optimal degree of conditionality

So far, we have treated α as an exogenous variable. Here we endogenise the degree of conditionality in equation (3). We posit that α is chosen at the EU level. For the EU, which is in a Stackelberg position relative to the governments, the loss function is:

$$L_{EU} = (Y_1^* - \bar{Y}_1^*)^2 + (Y_2^* - \bar{Y}_2^*)^2 + \varphi(\alpha - \bar{\alpha})^2, [9]$$

$$\varphi \geq 0$$

The EU policymaker tries to bring the potential output levels towards target, to avoid fragmentation between the countries. This is reflected in the country-specific recommendations, which aim at boosting investment and reforms. This is in line with the EU's priorities in terms of reforms and investments under the European Semester, and which are also reflected in the medium-term fiscal-structural plans under the new fiscal rules. The EU policymaker also faces a cost in terms of deviating from the politically-acceptable target for conditionality, $\bar{\alpha}$. The presence of this last term is motivated by the fact that the EU preferences eventually derive from those of the EU member states. The actual value of $\bar{\alpha}$ reflects the bargaining power of the two countries. Frugal would prefer tighter conditionality, while Profligate would prefer looser conditionality. In institutional terms, the relative weight φ attached to meeting the target for conditionality could be interpreted as the degree of autonomy of the EU (basically, the European Commission), with respect to the Council of the EU as the expression of the interests of the member states: a high value of φ implies that the Commission will have to abide strictly by the compromise within the Council; instead, a low value of φ means that the Commission could allow itself to deviate from the compromise achieved between the member states.

The optimal degree of conditionality set by the EU is obtained by minimising (6) with respect to α . An increase in Profligate's deficit affects both countries' potential output levels indirectly (and negatively) through the conditionality embedded equation (3) for EPGs. Variations in the degree of conditionality create a trade-off between this indirect effect on the potential output levels, the desire to get the deficit levels at their targets and the desire to hit the target for conditionality $\bar{\alpha}$. Because it is not possible to calculate the optimal degree of conditionality analytically, we resort to a numerical evaluation. The numerical results are found in the annex. We find in all instances an internal optimal value for α that is positive. Moreover, we find in all instances that all the potential output gaps in the EU loss function are positive, so none of these targets is overshoot in any of the cases.

First, we consider the case of $\omega_1 = \omega_2$. We start from a baseline parameter setting¹¹. In all cases, an increase in ω leads to an increase in the optimal degree of conditionality: while the leakage effect is magnified by an increase in ω , the larger physical content of the EPGs brings the potential output levels closer to their bliss points, allowing more focus on bringing the degree of conditionality towards its bliss point of 0.5. Further, increasing γ_2 for given $\omega_1 = \omega_2 < 0.75$ and γ_1 results in an increase in the optimal degree of conditionality. The reason is that the greater the productivity-enhancing content of Profligate's deficit, the closer Profligate's potential output will be to its bliss point, hence the more the focus can be to get optimal conditionality towards its bliss point of 0.5. Finally, a similar reasoning applies when we increase γ_1 keeping the other parameters constant.

We now consider some one-at-a-time deviations from the baseline parameter setting¹². Table A2 in the annex shows the results. First, we vary the effect that the EPG has on Frugal's potential output, ie we vary β_1 , holding the other parameters constant. Raising β_1 brings Frugal's potential output closer to its bliss point. This allows the EU policymaker to focus more on bringing Profligate's potential output towards its target (to restore the optimal trade-off among the gaps). This implies that the amount of EPGs needs to be raised, which is accomplished with an increase in Profligate's deficit, which in turn requires a reduction in the optimal degree of conditionality. Raising β_2 brings Profligate's potential output closer to its bliss point. To optimally balance again the gaps in the EU loss function (note that $\gamma_2 = 0$, hence there are no direct implications for Profligate's deficit), Frugal's potential output needs to rise, requiring an increase in Profligate's deficit, which in turn requires a fall in the optimal degree of conditionality. Raising the physical content of EPGs in Frugal or Profligate, while holding the physical content constant in the other country, leads to a rise in optimal conditionality. Profligate's deficit can be reduced, which raises EPG provision and shrinks the gaps between potential output its bliss point. This allows the EU policymaker to focus more on pushing optimal conditionality towards its bliss point.

4 Policy discussion

The analysis in the previous section yields several relevant policy implications for the design of conditionality. This section discusses the broader policy implications of our analysis, going beyond the strict confinements of our model.

4.1 From theory to practice: fiscal conditionality

The above model focuses on *fiscal* conditionality. Our analysis confirms that the level of conditionality matters for the fiscal behaviour within the EU. Generally speaking, the tightness of the conditionality needs to trade off, on the one hand, the desirability of a country pursuing sound fiscal policies and, on the other hand, delivering on the provision of EPGs benefitting EU countries. Too-lax conditionality would result into the full use of the available resources, but would entail also a reduction in the

¹¹ Specifically, in the baseline $\beta_1 = \beta_2 = \theta = \varphi = 1, \varepsilon = 2, \gamma_1 = 0.5, \gamma_2 = 0, \mu = 0.025, \bar{d} = 0, \bar{Y}_2 = \bar{Y}_1^* = \bar{Y}_2^* = 1, \hat{E} = 0.75$ and $\bar{\alpha} = 0.5$.

¹² In this case we set, unless noted otherwise, $\omega_1 = \omega_2 = 0.5$.

willingness of countries such as Germany, the Netherlands and other Northern member states to agree on substantial financing of EPGs, because the incentive to deliver fiscally disciplined policies is too weak, although these countries would also generally benefit from a more generous supply of EPGs. By contrast, too-tight conditionality reassures fiscally-conservative countries but leads to only limited use of the available resources by penalising excessively deviations from the fiscal norms. Hence, for fiscally rigorous countries, there is a trade-off between the positive externality from providing more EPGs and the negative externality from less fiscal discipline in the EU. In fact, if concerns about the latter prevail, a seemingly paradoxical result occurs: the conditionality may be set so tight that governments of profligate countries see no political room to adhere to it and give up on making the extra effort in delivering the agreed fiscal discipline to get EPGs financing. This would be the worst outcome, as neither fiscal discipline, nor a decent level of EPGs would be achieved.

How does the conditionality discussed here relate to that in the EU's new fiscal rulebook? The latter contains a double incentive, because in their medium-term fiscal-structural plans (MTFSPs), countries need to show how they will ensure the delivery of investments and reforms that address the country specific recommendations (CSRs) and how they will address the EU's listed common priorities, which include a fair and green digital transition, social and economic resilience, energy security and where necessary the build-up of defence capabilities. The MTFSP could provide an extra incentive to stimulate EPGs through EU co-financing of the agreed investments and reforms if their EPG content is sufficiently high. This would also help in addressing the lack of attention to the internal coherence of the plans.

Although the conditionality we propose requires adherence to the MTFSPs – both the fiscal disciplinary part and the delivery of the agreed reforms and investments – enforcement of the EU fiscal rules has so far been imperfect. In fact, the incentives to seek compromises in among finance ministers to avoid opening an EDP, or further steps in the procedure, may become even stronger than in the past, requiring the European Commission to toughen its stance on enforcement. In addition, the Conditionality Regulation, appropriately modified if necessary, would need to be applied. It requires EU resources for EPGs to be used in compliance with the Treaty obligations, including the new economic governance framework, and to be spent well, in particular by ensuring that their financing does not substitute for the financing of national investments that is already in the pipeline.

4.2 'NGEU-type' EPGs

As indicated above, the model of conditionality put forward in this paper applies naturally to EPGs that are financed at the EU level, but delivery of which is done at national level. As the comprehensive overview by Demertzis *et al* (2024) showed, there exist many EU-level instruments to stimulate these types of projects. They cover a variety of different areas, although most available resources are intended for the green and digital transitions. Funding comes in most cases from the EU budget or NGEU.

However, there exist hardly any instruments explicitly aimed at promoting positive cross-border spillovers. The instrument that comes closest to doing this is the Important Projects of Common European Interest (IPCEI)¹³, through which, under certain conditions, state aid rules allow EU countries and industry to invest jointly in breakthrough innovation and infrastructure. These conditions include that the market alone cannot deliver these investments, because the risks are too large for any individual player, they benefit the EU economy at large and they result in concrete positive spillover effects for the EU at large. While the IPCEIs currently do not receive funding from central resources, the IPCEI instrument may guide the design of a fund for EPGs, where the financing is at the level of the EU instead of at the level of the member states. One could envisage a *quid pro quo*, in which central funding for IPCEIs is made available in return for the introduction of conditionality on fiscal discipline for countries participating in an IPCEI.

The large set of existing instruments is likely to lead to a loss of effectiveness, as funding initiatives are not integrally prioritised and scattered over sectors, geographical areas or time. Moreover, many of the instruments fund initiatives with no or limited cross-border spillovers. While NGEU was useful to give EU economies a boost and paved the way for conditionality and EU debt issuance, the projects it funds are nationally oriented and have in most cases at most limited spillovers. Overall, it seems desirable to streamline the resources available for EPGs and to collect these into a single facility, like our fund. As mentioned, the IPCEI criteria could provide the basis for the selection of the investment projects to be financed by this fund¹⁴. These criteria would then be supplemented by conditionality related to adherence to the EU fiscal rulebook. Such a single facility would provide an integral trade-off among all initiatives based on EU priorities.

4.3 The financing of EPGs

So far, we have not addressed the role of the different EU financing possibilities, because the model is neutral with respect to how the EPGs are financed. Financing EPGs through a newly created fund would come rather naturally in the case of an EPG with a project character, say an infrastructure investment with positive spillovers that is mainly rolled out locally or by a few countries jointly. In the case of EPGs that benefit all member states, financing through the multiannual financial framework (MFF), ie the regular budget of the EU, might be the more natural option. However, setting up a fund is politically easier to realise, as it will be of known magnitude and temporary in nature. Moreover, experience has been obtained through NGEU. By contrast, once certain expenditures have been included in the MFF, they attain a '*status-quo* nature', and it becomes much more difficult to terminate them. This way, spending on EPGs can achieve a more permanent status.

¹³ See https://competition-policy.ec.europa.eu/state-aid/ipcei_en.

¹⁴ The mission letters to the 2024-2029 European Commission Executive Vice-President for Prosperity and Industrial Strategy (responsible for the internal market) and the Commissioner for Budget, Anti-Fraud and Public Administration mention the possibility of EU financing of IPCEIs. See https://commission.europa.eu/document/6ef52679-19b9-4a8d-b7b2-cb99eb384eca_en and https://commission.europa.eu/document/db369caa-19e7-4560-96e0-37dc2556f676_en.

Much of the resistance to EPGs comes from the fear that they would lead to the redistribution of resources (*juste-retour* argument) or that they lead to an increase in the overall fiscal burden. The latter should not be the case: EPGs would substitute for national public good provision, so would lead to a shift from national to EU financing, and to the extent that there are economies of scale in their provision, they should in fact reduce the overall fiscal burden. If the provision of public goods at the national level is sub-optimally low, then a shift to the EU level could lead to an overall increase in the tax burden, but that would then be justified by the positive welfare effect.

5 Conclusions

This paper has studied how the provision of EPGs can be promoted. Depending on the types of EPG, they may benefit a subset of EU countries or the entire EU. However, that does not imply that it is politically easy to realise them. There is always at least a subset of member states reluctant to expand EU-level financing and/or giving up some of their autonomy. This is one reason why progress with EU integration is so slow. One way to speed up the process and give countries more confidence in the protection of their interests is to attach conditionality to EPG initiatives. When it comes to access to collectively funded initiatives, introducing conditionality based on adherence to the MTFSPs would simultaneously incentivise EU countries to exert fiscal discipline, deliver on agreed structural reforms (as they are part of the MTFSPs) and contribute to the delivery of EPGs.

Choosing the appropriate design and tightness of conditionality is a delicate matter. On the one hand, excessive tightness leads to the under-delivery of EPGs and may even discourage member states from adhering to their fiscal commitments when the circumstances get tough. This would also undermine the benefits accruing to countries critical of expansion of EU tasks deriving from EPGs. On the other hand, lax conditionality may risk losing member states critical of EU-level initiatives.

NGEU has paved the way with the design of conditionality. Conditionality is an interactive process, in which countries receive payments conditional on achieving certain milestones. Breaking up a complicated project to give insight into whether it is on track would allow a timely correction, thereby enhancing the effectiveness of the conditionality. Also, there need to be credible fall-back options when countries fail to respect the conditionality. Termination of a large project is usually not a realistic option. Governments prone to misbehaviour know this and may exploit it. A possible, but politically difficult, solution would be to block a misbehaving country's recourse to other EU funds, such as the Structural and Cohesion Funds. Therefore, in line with the Conditionality Regulation, these funds could serve as 'collateral' for the completion of the project.

Project proposals for funding would likely generate political discussion, making it necessary to assess to what extent proposed projects benefit multiple countries or the entire EU, and whether they have a positive net present value. Such an assessment would best be done by an independent entity with

adequate technical expertise¹⁵. As argued by Bakker *et al* (2024b), this role could be played by the European Investment Bank (EIB), which has expertise in the areas of climate, infrastructure and innovation. Ideally, the EIB would co-finance the projects that it assesses, so it is in its own interest to provide high-quality assessments, while moreover this could persuade private financiers to come on board.

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¹⁵ Such an assessment is not straightforward, but estimates are often done. For example, Bordignon *et al* (2020) did a benchmarking analysis to estimate the amount of waste in public spending in a number of areas. Supplementary analysis indicated the presence of returns-to-scale and spillovers for procurement in the areas of healthcare and defence.

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Annex: The optimal value of the conditionality: numerical computations

Baseline analysis

We start by assuming that $\beta_1 = \beta_2 = \theta = 1$, $\mu = 0.025$,¹⁶ $\bar{d} = 0$ and all the other targets deviate from zero. Specifically, we set $\hat{E} = \bar{Y}_2 = \bar{Y}_1^* = \bar{Y}_2^* = 1$ and $\bar{\alpha} = 0.5$. Further, we assume that in the baseline parameter setting the relative weights on the gaps with the targets are all equal to one, i.e. $\delta = \xi = \psi = \varphi = 1$ and $\varepsilon = 2$.

Table A1 provides the optimal values for conditionality α for different combinations of γ_1 , γ_2 and $\omega_1 = \omega_2$. For this parameter combination, we vary γ_1 over the values $\{0.25, 0.5, 0.75\}$, γ_2 over the values $\{-0.5, -0.25, 0, 0.25, 0.5\}$, and $\omega_1 = \omega_2$ over the values $\{0.00, 0.25, 0.5, 0.75, 1.0\}$. The range for γ_2 contains negative values motivated by the possibility that Profligate's deficit is largely driven by disincentivising social spending. We exclude negative values for conditionality. Hence, in searching for the optimal degree of conditionality, we vary α over the interval $[0, 2]$.

¹⁶ In PPP terms, German exports to France were \$5,016 billion (<https://www.worlddeconomics.com/Country-Size/Germany.aspx>). Moreover, German exports to France were \$125.94 billion in the same year <https://tradingeconomics.com/germany/exports/france#:~:text=Germany%20Exports%20to%20France%20was,updated%20on%20April%20of%202024>). Hence, exports to France as a share of German GDP are about 2.5 percent. Based on this, we set $\mu = 0.025$.

Table A1: Optimal degrees of conditionality for different combinations of physical content of EPGs and different deficit compositions in Frugal and Profligate – baseline parameter combination

$\omega_1 = \omega_2$ →	0.00	0.25	0.50	0.75	1.00
$\gamma_1 \downarrow$	$\gamma_2 = -0.50$				
0.25	0.090	0.171	0.270	0.392	0.500
0.50	0.105	0.187	0.285	0.403	0.502
0.75	0.125	0.207	0.303	0.415	0.505
$\gamma_1 \downarrow$	$\gamma_2 = -0.25$				
0.25	0.132	0.202	0.288	0.391	0.487
0.50	0.148	0.218	0.302	0.401	0.489
0.75	0.170	0.238	0.319	0.413	0.492
$\gamma_1 \downarrow$	$\gamma_2 = 0$				
0.25	0.174	0.233	0.305	0.393	0.476
0.50	0.191	0.249	0.319	0.402	0.479
0.75	0.214	0.270	0.337	0.414	0.482
$\gamma_1 \downarrow$	$\gamma_2 = 0.25$				
0.25	0.216	0.263	0.323	0.396	0.469
0.50	0.235	0.280	0.337	0.405	0.471
0.75	0.258	0.302	0.354	0.416	0.474
$\gamma_1 \downarrow$	$\gamma_2 = 0.50$				
0.25	0.258	0.294	0.342	0.401	0.463
0.50	0.278	0.312	0.356	0.410	0.465
0.75	0.303	0.333	0.373	0.420	0.468

Variations on the baseline parameter setting

Here we vary one parameter at a time, starting from the parameter setting $\beta_1 = \beta_2 = \theta = \delta = \xi = \varphi = 1, \varepsilon = 2, \gamma_1 = 0.5, \gamma_2 = 0, \mu = 0.025, \bar{d} = 0, \bar{Y}_2 = \bar{Y}_1^* = \bar{Y}_2^* = 1, \hat{E} = 0.75$ and $\bar{\alpha} = 0.5$.

Table A2: One at a time variations on the baseline parameter setting

β_1	0.00	0.25	0.50	0.75	1.00
$\alpha - \text{opt}$	0.397	0.351	0.322	0.312	0.319
β_2	0.00	0.25	0.50	0.75	1.00
$\alpha - \text{opt}$	0.418	0.359	0.322	0.309	0.319
ω_1	0.00	0.25	0.50	0.75	1.00
$\alpha - \text{opt}$	0.316	0.318	0.319	0.321	0.323
ω_2	0.00	0.25	0.50	0.75	1.00
$\alpha - \text{opt}$	0.194	0.251	0.319	0.400	0.476



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Bruegel, Rue de la Charité 33, B-1210 Brussels
(+32) 2 227 4210
info@bruegel.org
www.bruegel.org