SHARING SOVEREIGNTY AND EUROPEAN PUBLIC GOODS: A CONCEPTUAL FRAMEWORK

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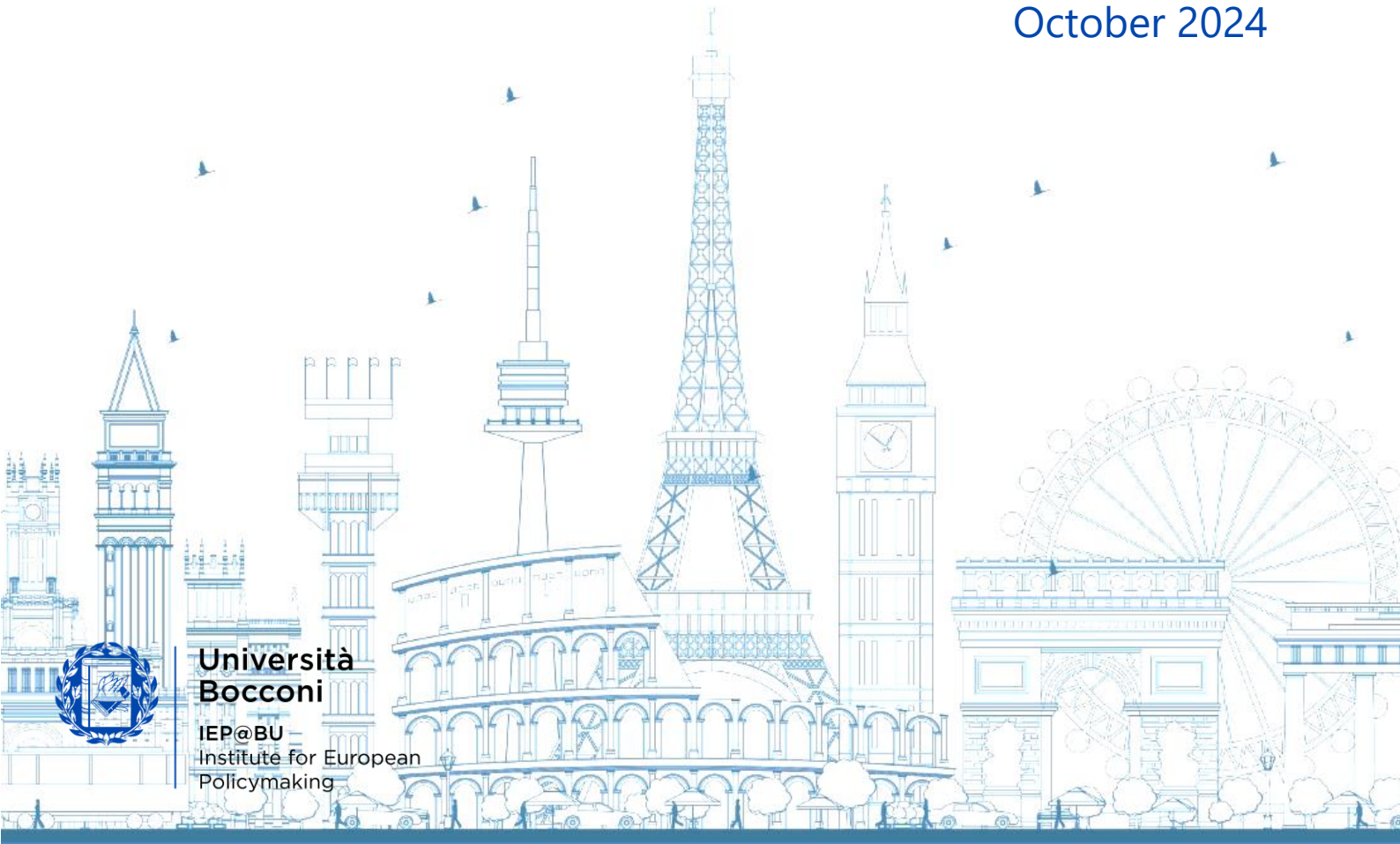

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Abstract[1]

The recent debate on European integration has highlighted the need to increase the provision of European Public Goods (EPGs) in the economic, security and defence fields. While there is broad consensus on the diagnosis, the implementation is encountering significant political constraints. Indeed, it has proven highly challenging to overcome resistance to a reform of the European Union's (EU) multiannual budget that would allow for a greater supply of EPGs. In this paper, we analyse the underlying reasons for such resistance within the EU. On the one hand, we emphasise the heterogeneity of national benefits arising from the different types of EPGs and the costs associated with the transfer of national sovereignty for the financing and production of these public goods. The Union's varying national appreciation of the benefits stems from the fact that EU countries have divergent preferences relative to – respectively – EPGs aiming at boosting innovation and EPGs pursuing greater solidarity. On the other hand, the specific national costs are linked to the differentiated strength of the state and the intermediate institutions. The actual provision of the two types of EPGs reflects national preferences and the relative bargaining power of each member state. A preliminary analysis of the differing combinations of costs and benefits in a subset of EU countries (France, Germany, Italy and Sweden) allows for the identification of the bottlenecks in the provision of EPGs. It thus becomes possible to derive initial policy conclusions for overcoming the main obstacles.

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1. Transfer of sovereignty and the frontier of integration

As has been repeatedly stated (see, e.g. Buti and Messori, 2023), Russia's aggression against Ukraine and the subsequent geopolitical conflicts have had pervasive negative consequences for the European Union (EU) and its economy, beyond the short-term impact on growth. Regarding the international agenda, cooperation and competition in markets have been dominated by technological conflicts between the United States and China, making it increasingly difficult for the European economy to leverage its strengths (low environmental impact, effective regulation, comprehensive welfare state) and minimise its weaknesses (an increasing distance from innovation frontier, a weakening social inclusion capacity, cumbersome decision-making). Regarding the internal agenda, the EU has lost those advantages (access to low-cost energy, availability of inputs for advanced productions, limited defence responsibilities entrusted to NATO and the United States) that had fostered a model of economic growth essentially relying on external demand. Thus, the obsolescence of the European production system has become apparent: excessive focus on small firms operating in international market niches, robust but mature technologies, a lack of advanced services and an over reliance on traditional services (including in the financial sector). It has also become clear that, rather than signalling strong competitiveness, persistent positive net exports are a consequence of insufficient aggregate investments (compared to aggregate savings) and a cause of the worsening technological gaps.

The EU can safeguard its international standing and internal cohesion only by changing its production model. This involves implementing 'green' and digital transitions, innovating production organisation, expanding the share of firms with a European size, defining new links between small and medium-sized firms along transnational value chains, aggregating the defence industrial sector, building common security measures, and strengthening the safety net for social protection. These objectives cannot be achieved solely through national resources or through the centralised resources of Next Generation-EU (NGEU). They also require the mobilisation of private financial wealth and the creation of an EU Central Fiscal Capacity (CFC).

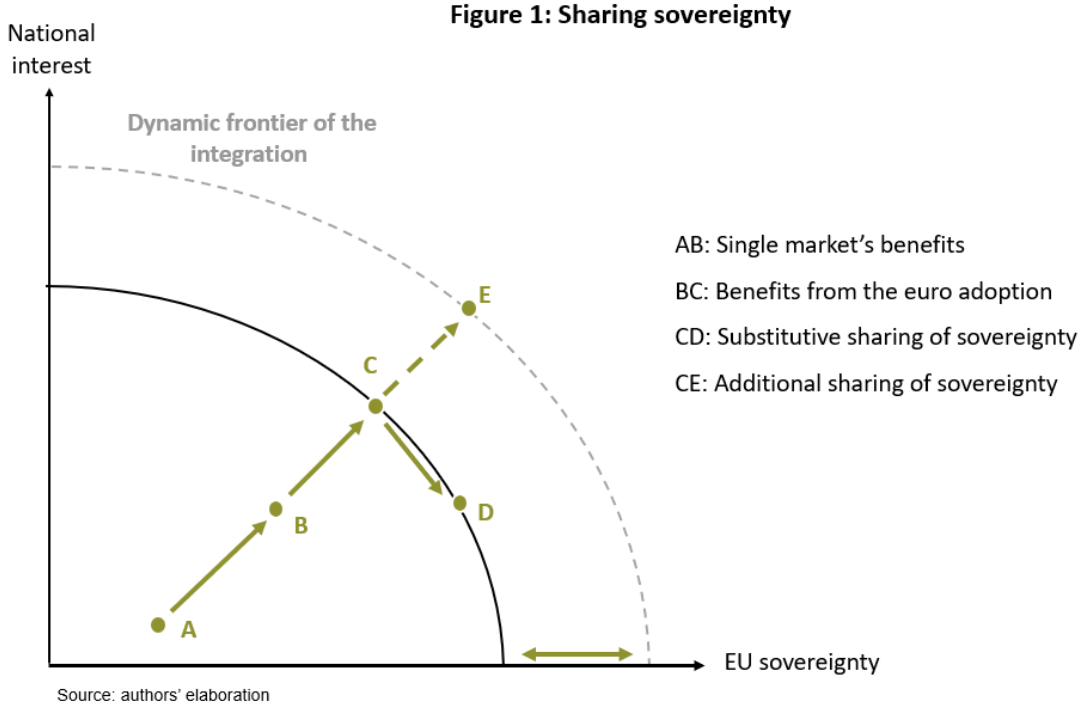
Regarding the limitations of NGEU resources, it is enough to recall that: the funding is temporary and set to expire in 2026, whereas the required transformations have long-term horizons and need more substantial and stable financing. Moreover, although within shared priorities, the reforms and investment supported by NGEU tend to respond to national preferences; the goals at stake are, instead, at least European in scale. Therefore, the needed CFC must be permanent, adequate for financing European priorities, and it must be based on the expansion—direct or indirect—of the European budget acting also as a catalyst for mobilising private financial wealth (see Buti and Messori, 2022; Buti, 2023). This should result in the production of European Public Goods (EPGs) as a crucial tool for implementing a centralised fiscal policy attentive to market signals and open to competition but also apt to build projects entrusted to Europe-wide firms or European production chains. This policy should be comparable to the analogous programmes implemented by other international actors.

In continuity with previous contributions (see, e.g., Buti *et al.*, 2023), we adopt a pragmatic definition of EPGs by partly downplaying the analytical features traditionally attributed to public goods (non-rivalry and non-excludability). The concept of public goods includes all those goods that, while having significant production costs but not allowing the complete internalisation of net benefits, are supplied

in insufficient quantities by the private sector and therefore require public intervention.[2] Additionally, EPGs have important economies of scale and scope so that national public interventions must be complemented by a European public intervention. Hence, EPGs entail the centralisation of both funding and production, implying a partial but progressive transfer of national sovereignty.

The construction of the single market and the euro as a common currency have already induced significant transfers of national sovereignty in favour of the EU (or the euro area). The evidence collected by empirical research and the outstanding performance of several new entries in the EU have proved that these transfers have benefited the interests of the member states (see Lane, 2006; Lehtimäki and Sondermann, 2020). A stylised illustration of the process of sovereignty sharing is offered in Figure 1: combining the transfer of sovereignty in favour of the EU (horizontal axis) and national interests (vertical axis), we identify point *C* on the integration frontier. The question is whether further transfers of sovereignty to the EU that would benefit national interests are feasible today. This would entail an upward shift of the integration frontier (segment *CE* in Figure 1), hence avoiding a downward shift along the frontier (segment *CD*). In this paper, we argue that the production of EPGs can be a tool for shifting the integration frontier outwards, because EPGs play an important role in changing the obsolete European production model.

Figure 1: Sharing sovereignty



Source: authors' elaboration

[2] See Stiglitz (1986), chapter 1.

The choices involved in sharing sovereignty are, however, more complex than in the previous description. The attitudes of national authorities show that many EU member states do not perceive an increased production of EPGs as boosting national interest, primarily because this would imply shifting regulatory and policy powers from individual member states to European institutions. Recent events indicate that centrally funded initiatives for the digital and 'green' transitions have not been considered Pareto-improving by European governments or socio-economic actors. Concerning EPGs that support the digital transition, a good example is the pressure exerted on EU institutions by countries such as France and Germany to relax state aid rules instead of providing adequate EU financing for the numerous but weakly-funded set of programmes apt to implement a European industrial policy. Concerning the opposition to EPGs that support the 'green' transition, good examples are provided by the *gilets jaunes* movement a few years ago or by the 'tractor revolt' of late 2023 and early 2024. These examples suggest that the aggregate analysis hides two opposing conceptions of the national interest. A first conception focuses on direct short-term effects of pooling sovereignty; another incorporates the indirect effects that are projected into the long term but are exposed to higher risks of failure.

The previous considerations emphasise the need for a more disaggregated analysis. To avoid a complex description of each member state's specificities and to adopt instead an 'ideal-type' method,[3] it is necessary to identify indicators capable of grouping EU countries into relatively homogeneous subsets. In this respect, the factors that matter are numerous. They range from the relative efficiency of national production structures to the cultural and ideological preferences of each country, from the strength of its central state and intermediate institutions to the role played by socio-economic bodies and representations, from the perception of specific external threats to the importance of individual countries within the EU or at the global level. For our specific purposes and without any claim to exhaustiveness, we will utilise two composite indicators: (i) the degree of state centralisation, and the quality and functions of decentralised institutions; (ii) the strength of the production structure and the incidence of the intermediate bodies.[4]

The first indicator, which is defined by the national institutional framework and the importance of the quantitative and qualitative tasks performed by the state in combination with regional and local institutions, is utilised to assess to what extent the transfer of sovereignty in favour of the EU for the production of EPGs is compatible with the country's internal stability. It thus aims at measuring the costs of a possible transfer of national sovereignty. The second indicator, based on the economic strength of production processes and on the capacity of intermediate bodies to manage and reconcile social tensions, aims at gauging the advantages of this possible transfer of sovereignty in terms of technological and organisational innovation as well as of greater cohesion of the various member states and the increased well-being of their citizens.

[3] The reference is to Weber (1922, Part I, Chapter 1), who defines “ideal types” as theoretical constructs in the social sciences that do not correspond to actual data but provide a casuistry “endowed with meaning” that offers an analytical justification to social actions.

[4] A more in-depth analysis should consider that composite indicators (i) and (ii) tend to be influenced by many other variables here neglected or taken as a given. For example, the combination of the strength of a country's production and social structure can be correlated with the cultural and ideological choices of that country. Furthermore, the components of each of our indicators are not always positively correlated: highly centralised states can interact with weak intermediate institutions, and strong production structures can be coupled with weak intermediate bodies. We will return to this issue in the following sections.

The correspondence between national convenience and actual transfer of sovereignty in favour of the EU will remain complex, even if several possibly influential factors are not included in the two indicators selected (the strength of the state and the economic and social strength). At least initially, these further factors are treated as a given. Our first analytical step will focus on a more articulated definition of the two composite indicators selected above.

2. Transfer of sovereignty and national interest

Political science measures the strength of national states and their institutional cohesion by assessing the degree of electoral consensus, the relative stability of governments, and the effectiveness of institutional settings (see, e.g., Huber *et al*., 2003). Economic analysis makes a similar measurement but bases it on the capacity of the governments and the related intermediate institutions to achieve the objectives set *ex ante* (see Acemoglu and Robinson, 2019). Here instead, a criterion more linked to organisational aspects is adopted. It is assumed that a given EU member state will be more structured and stable if its national government and intermediate institutions satisfy two characteristics: first, they are endowed with adequate powers to decide, finance, and implement significant material and immaterial infrastructures in social, institutional, and economic areas; second, they have a strong capacity of coordinating and utilising their powers effectively and efficiently. In the following, an EU country satisfying these two criteria will be labelled as a 'strong' national state. According to our previous *caveats* on complexity (see n.4), it will be considered that excessive centralisation could weaken the functionality of intermediate institutions, thus undermining the strength of the national state; an analogous consequence could derive from an excessive decentralisation.

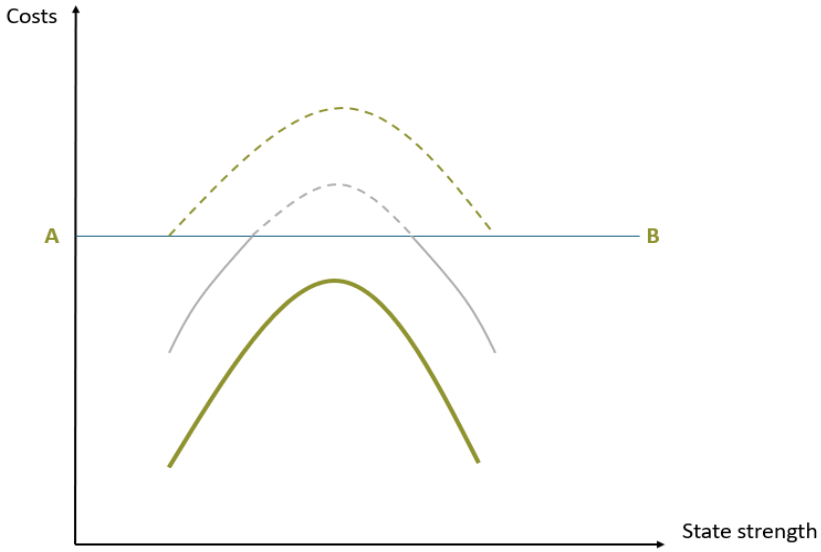
This definition does not mean that, if compared to a 'weaker' country, a relatively strong state will always have a greater propensity to transfer sovereignty to the EU without compromising national stability. The evaluation criterion to be adopted concerns the impact that the transfer of sovereignty has on the institutional cohesion of the country. From an economic point of view, the standard measure of this impact is linked to its (political and institutional) costs.

Countries characterised by very weak institutional settings (including the intermediate ones) have limited competences and/or ineffective powers in performing the attributed tasks; hence, these countries suffer low costs for transferring sovereignty to the EU because they give up prerogatives that are already poor. At the opposite extreme, very strong national states and intermediate institutions should have more limited costs of transferring sovereignty to the EU provided that this transfer of competences and powers remains below a given threshold (see Figure 2). Our assumption is that a limited transfer of sovereignty does not weaken either the high decision-making capacity or the ability of these countries to safeguard their institutional cohesion. In contrast, countries with an intermediate strength in terms of national state and other institutions tend to incur high objective costs for transferring sovereignty to the EU because such transfers may alter their more fragile equilibrium between the central government and intermediate institutions, and hence they can jeopardise national cohesion.

Figure 2, which measures the strength of the various EU member states on the horizontal axis and the associated costs due to the transfer of sovereignty on the vertical axis, provides a graphical representation of the previous analysis. In its first section, the costs curve depicts the position of

weak countries and is positively related to their increased strength, then it reaches a maximum in coincidence with the position of a country with an intermediate strength, and finally it decreases, reaching a minimum to identify the position of a very strong country.[5] As the transfer of sovereignty increases (as measured in Figure 1), the costs curve shifts upwards until a threshold (indicated by the horizontal line *AB* in Figure 2) beyond which an increasing number of member states are unwilling to transfer further sovereignty to the EU. [6]

Figure 2. Costs of transferring sovereignty



Source: authors' elaboration

The costs curve alone is not sufficient to determine whether an EU country has a real incentive to share sovereignty; it is also necessary to construct a quantitative measure of the relative benefits. By transferring sovereignty to the EU, a member state receives benefits that depend on two factors: the transfer allows the EU to finance and produce new EPGs by means of a permanent CFC underpinned by a corresponding increase in 'own resources'; together with other countries in the area, each member state benefits from the new EPGs but it also bears the charge of making the required 'own resources' available or the burden of supplying the related guarantees.[7] The resulting

[5] Our graphical representation is highly simplified and, in some respects, arbitrary. The costs curve connects discrete points, each determined by the combination of the strength of a given national state and the cost of transferring sovereignty of the corresponding EU country. Consequently, it would be necessary to provide an endogenous measure of the strength and associated costs of all the individual EU countries to justify the identification of the maximum and minimum points of the costs curve and the specific shape of its two segments – respectively – on the left and right of the maximum.

[6] In the following, we will assume that the possible increases in sovereignty sharing remain below such threshold. This assumption is crucial to eliminate the possibility that, above this threshold, the costs of all the member states increase exponentially. In this perspective, Figure 2 assumes that the sections of the cost curves above the threshold *AB* are 'notional'.

[7] As Grund and Steinbach (2023) argue, the Treaty on the Functioning of the EU (TEUF) allows for the financing of recurrent expenditures in deficit in the EU multiannual balance sheet provided that the amount of this financing be counterbalanced by a credible commitment of collecting an equivalent amount of 'own resources' (cf. TEUF, art. 311). Credibility implies that a joint guarantee made available by the member states is necessary. In fact, if the European institutions do not meet their commitment of collecting adequate 'own resources' at a given time, this failure will have to be fully compensated by

benefits schedule is thus a curve net of the charges and the burdens suffered by member states to allow the production of EPGs. In line with the simplifications imposed on our analysis, it is assumed that the net benefits of each member state depend on its economic and social strength, that is, on the efficiency of its production structure and the capacity of its intermediate bodies to absorb social tensions.

With acceptable margins of approximation, it is possible to measure the relative efficiency of a national production system. Conversely, to our knowledge, there are no satisfactory aggregate indicators apt to measure the impact on social strength of intermediate bodies ranging from social partners to a rich spectrum of associations. The most used economic variables refer to the labour market: the degree of workers' unionisation, the centralisation of wage negotiations, and the coverage of collective contracts.[8] However, in this approach, other significant markets and organisations are not considered. In the absence of a satisfying aggregate indicator, we assume that the intermediate bodies play the role of representing the legitimate and conflicting interests of different social groups. Thus, these bodies safeguard the general purposes that hold a community together without denying its internal conflicts and stifling its dissent.[9]

The strength of intermediate bodies is thus measured by their ability to combine protections of specific groups and the internalisation of the common interest, thereby strengthening the cohesion of the community. Clearly, in many instances, intermediate bodies only pursue partial goals that increase social fragmentation and create distortive privileges (see, e.g., Olson, 2000). Our definition implies that, in those cases, the intermediate bodies are 'weak'. Consequently, the presence of strong intermediate bodies is an antidote to the rooting of rent-seeking positions and the shortening of decision-making horizons that characterise fragmented societies. Various authors (see, for example, Collier, 2018) have insisted on the positive relationships between the effectiveness of intermediate structures and the degree of social inclusion (extended to the integration of migrants). Over the past several years, in mature economies, intermediate bodies have significantly weakened. The phenomenon has also deeply affected several EU member states. However, on the international scene, the EU remains the economic and social area with the strongest intermediate bodies. Furthermore, in many member states, there exists a positive correlation between the relative strength of the production structure and that of its intermediate bodies. Hence, our definition of the most complex component of the second indicator appears reasonable.[10]

Our second composite indicator is defined by the economic and social strength of an EU country. The higher this indicator, the more likely a member state would appreciate the advantages – here expressed in terms of quantifiable net benefits – deriving from the subset of the EPGs which

an intervention jointly guaranteed by the member states.

[8] In this respect, a seminal contribution that gave rise to a broad debate is Calmfors and Driffill (1988).

[9] Following an approach of political philosophy (see, e.g. Mouffle, 1999), we maintain that the intermediate bodies (and institutions) do not have the duty of suppressing the conflicts to impose a "deliberative democracy" but that of regulating the conflicts to avoid the transformation of an "agonistic democracy" in chaotic disequilibria.

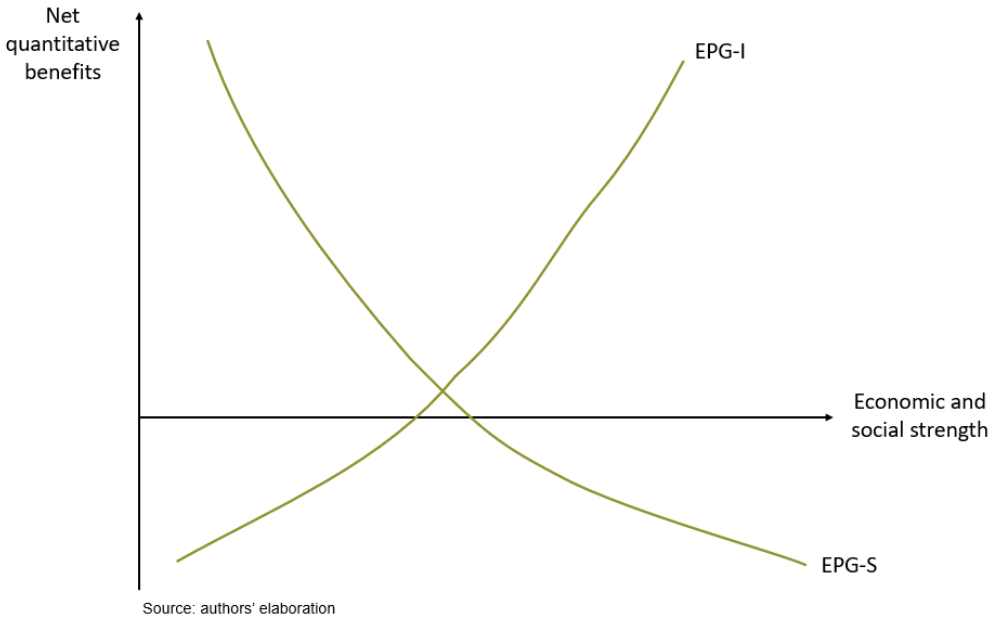
[10] According to the neo-institutionalist theory (see Williamson, 1975 and 1985), our choice of the second composite indicator has the merit of emphasising that production efficiency and social strength cannot be reduced to the functioning of the state and the market. Neo-institutionalists maintain that there is a *continuum* between the state and the market thanks to the rich network of intermediate institutions. Here we do not address the question whether this approach would also require the weakening of our separation between intermediate institutions, as a component of the first indicator, and intermediate bodies, as a component of the second indicator.

produces positive externalities and helps approaching the technological frontier in industry and services and reduce the environmental footprint. In what follows, this type of EPGs is defined as Innovative EPGs (EPG-I). Examples of EPG-I are the construction of digital infrastructures capable of accelerating innovations that combine the EU's 'green' and digital transitions.

A second subset of EPGs helps strengthen the EU's social cohesion. We define such type of EPGs as Solidarity EPGs (EPG-S). In principle, countries with high economic and social strength prefer to produce public goods internally, because they can thus support an effective and efficient welfare system. Thus, the willingness of these EU countries to demand EPG-S is low. For example, if the reference was to the centralised provision of health services and protection of the most vulnerable social groups (assistance to the elderly or interventions for the protection and basic training of workers with obsolete skills), strong countries would consider the devolution of their sovereignty to the EU as a loss. The opposite is true for EU countries with relatively low economic and social strength. For such countries, EPG-S supporting a more robust welfare state offers significant net benefits. Conversely, if the European centralised resources are used for supplying EPG-I aimed at accelerating the 'green' transition and producing technological leaps, the benefits of weak member states may turn into net disadvantages as their low economic and social strength determines the inability of using EPG-I effectively and efficiently. Instead of exploiting the potential support that EPG-I offer to the medium-long-term growth prospects, these countries realise that the use of new EPG-I would heighten social conflicts that their weak intermediate bodies are not able to smoothen.

Therefore, to measure the net quantitative benefits deriving from a transfer of national sovereignty to the EU, it is necessary to distinguish these two types of EPGs: EPG-I, which mainly benefit EU countries with high economic and social strength, and EPG-S, which instead benefit countries with low economic and social strength. Whilst the boundary between these two types of EPGs is often ambiguous, this distinction is useful as a first approximation. Figure 3 provides a stylised representation of the two net benefits curves. It features, on the horizontal axis, the economic and social strength of countries and, on the vertical axis, the relative net quantitative benefits of EPG-I and EPG-S. According to the analysis above, the EPG-I curve is upward-sloping whereas the EPG-S curve is downward-sloping

Figure 3. Benefits deriving from EPG-I and EPG-S



Source: authors' elaboration

3. A simple model

The considerations made in the previous section and the related graphical representations (see Figures 2 and 3) can be translated into an analytical framework that, despite some further simplifications, allows for the specification of an important variable hitherto left in the background or treated as exogenous. This new variable is the relative share of EPG-I and EPG-S. Our model refers to two EU countries (generically indicated as country *i*, with *i* = 1, 2) that must decide whether it is advantageous or not to transfer sovereignty to the EU. Country *1* is characterised by high economic and social strength compared to country *2*. We have:

(1) $Y_1 = a_1 E_I + b_1 E_S$

(2) $Y_2 = a_2 E_I + b_2 E_S$

(3) $R_1 = Y_1 - C_1$

(4) $R_2 = Y_2 - C_2$

where the symbols denote: E_I and E_S the net benefits that would derive from an optimal use – respectively – of EPG-I and EPG-S by country *i*;[11] Y_1 and Y_2 the net benefits actually obtained by countries *1* and *2* when they implement their decision of transferring sovereignty to the EU; a_i and b_i the parameters that measure the specific net benefits that the two types of EPGs assure – respectively – to countries *1* and *2* based on their relative economic and social strength (i.e., the second composite indicator); $C_1$and C_2 the costs based on the relative strength of the state (i.e., the first composite indicator) that are borne – respectively – by countries *1* and *2* when they actually decide transferring sovereignty to the EU; R_1 and R_2 the net returns obtained – respectively – by countries *1* and *2* from transferring sovereignty to the EU (henceforth, R_1 and R_2 will be simply labelled returns).

Regarding equations (1) and (2), two conditions must be made explicit. First: the total amount of EPGs that the two countries have access to is fixed exogenously by European institutions; conversely, as already stated, the actual distribution of EPGs between EPG-I and EPG-S (i.e., the composition of EPGs) is an endogenous variable. Second: the previous condition implies that the two member states can access the predetermined amount of new EPGs (henceforth indicated as *E*) only if both countries independently decide, based on their respective preferences and expectations, that it is advantageous for them to devolve sovereignty in favour of the EU; if one of the two countries refuses to do so, there will be no new EPGs so that Y_i, E_i and C_i must be set to zero.[12] Moreover, considering the assumptions specified at the beginning of this section, we have that country *1* benefits more from EPG-I while country *2* benefits more from EPG-S. Hence, equations (1) and (2)

[11] As underlined in the previous section, the net benefits of each of the two EU countries are determined by the difference between its gross benefits deriving from the access and utilisation of the new EPGs, on the one hand, and its charges to be paid for implementing the future but equivalent increase in the 'own resources' or for covering, in cooperation with the other country, this future increase through a joint guarantee. The average value of these charges is denoted L^{OR}.

[12] This result is due to our two-country model. If we assumed instead *i* ≥ 3, it would become possible to have a positive supply of new EPGs even in the case in which only a subset of member states found it advantageous to transfer national sovereignty in favour of the EU. In this case, there would be the so-called 'enhanced cooperation' foreseen by the Treaty. For the sake of simplicity, here we state that: $a_1 E_I + b_1 E_S > C_1$; and $a_2 E_I + b_2 E_S > C_2$.

imply: $a_1 > b_1, a_2;\ b_2 > a_2, b_1$.

The costs C_i should be treated as exogenous. As discussed above, the values of these costs correspond to the position of the two countries on the costs curve of Figure 2 for a given sovereignty transfer that allows for the availability of the total amount of EPGs denoted by *E*. These costs can also be defined in relation to *E*. We get:

$c_1 = \frac{C_1}{E}$; $c_2 = \frac{C_2}{E}$.

To determine endogenously the allocation of the given amount *E* between the two types of EPGs, we denote *ω* as:

(5) $\omega = \frac{E_I}{E}$; $(1 - \omega) = \frac{E_S}{E}$.

We assume that the equilibrium value of *ω* results from the negotiation between the two countries in a Nash bargaining game (see Myerson, 1991, pp. 370-80). The solution of this game depends on the relative bargaining powers (*Φ*) of the two member states, under the constraint that both countries are willing to transfer sovereignty to the EU. As previously mentioned (see n.12), this dual constraint is met only if:

(6) $R_1 > 0$ e $R_2 > 0$.[13]

Each member state aims at maximising its own return. Substituting equations (1), (2), and (5) into equations (3) and (4), we have:

(7) $\max_{\omega} R_1^{\phi_1} R_2^{\phi_2} = \max_{\omega} \{[a_1\omega + b_1(1-\omega)]E - C_1\}^{\phi_1}\{[a_2\omega + b_2(1-\omega)]E - C_2\}^{\phi_2}$.

Let us normalise the sum of the bargaining powers of the two countries to 1. We can thus denote $\Phi_1 = \phi$ and $\phi_2 = 1 - \phi$. With a bit of algebra, the first-order condition for the solution of the maximisation problem leads to:

(8) $\omega^* = \frac{\phi(b_2 - c_2)}{b_2 - a_2} - \frac{(1-\phi)(b_1 - c_1)}{a_1 - b_1}$;

where, being $a_1 > b_1$ and $b_2 > a_2$ and considering that the condition $b_2 > c_2$ can be easily derived from the assumption $R_2 > 0$, we will have $\omega^* > 0$ if ϕ is sufficiently larger than 0.5.

The equilibrium value *ω∗* determines the allocation *of E* between EPG-I and EPG-S that maximises the returns of the two member states, given their relative bargaining powers. Equation (8) also reiterates that our previous assumption that the dual constraint R_1>0 e R_2>0 is always satisfied is based on a reasonable consideration: neither the Commission, nor the EU country with the stronger bargaining power would find it advantageous to fix a value of *ω∗* that entails such an unbalanced composition between EPG-I and EPG-S that the other country would choose to exit and not give up any sovereignty to the EU, thereby preventing a centralised production of public goods (i.e., *E* = 0).

Equation (8) shows that ω* depends on three exogenous variables: ϕ, c_1 and c_2. The signs of the partial derivatives of ω^* with respect to these variables are, respectively:[14]

[13] Hence, without any loss of generality, equation (6) is never binding.

[14] It is worth noting that we exclude the extreme case, in which country *1* and country *2* have the same preferences in terms of EPG-I and EPG-S, and that they bear the same costs and charges. In that case, the only difference between our two symmetrical countries would be their relative bargaining power. However, as it is easy to check from equation (8), the

(9) $\frac{\partial \omega^*}{\partial \phi} > 0$, subject to the following condition:

(9a) $(a_1 - b_1)(b_2 - c_2) > (a_2 - b_2)(b_1 - c_1)$ with $b_2 > c_2$

(10) $\frac{\partial \omega^*}{\partial c_1} > 0$

(11) $\frac{\partial \omega^*}{\partial c_2} < 0$

It is worth noting that, given the above specification of the relative values of the parameters a_i and b_i (i.e., $a_1 > b_1$ and $a_2 < b_2$) and given the inequality $b_2 > c_2$, condition (9a) will be surely met if $b_1 > c_1$. However, this last inequality is hard to justify in our analytical framework, therefore it is important to show that condition (9a) will also be met with a high probability even if $b_1 < c_1$, that is, even if the second component of that condition has a positive value.[15] It follows that, as expected by the economic analysis, any increase in the bargaining power of the country with the higher (lower) economic and social strength leads to an increase in the weight of EPG-I (EPG-S) relative to EPG-S (EPG-I). Furthermore, the signs of the derivatives (10) and (11) meet the expectations: if there is an increase in the cost (c_1) of the member state with the higher economic and social strength, this state will be compensated through an increase of EPG-I; symmetrically, if there is an increase in the cost (c_2) of the member state with the lower economic and social strength, this state will be compensated by an increase of EPG-S.

Besides pursuing upward shifts of the integration frontier and the consequent funding and production of *E*, it is assumed here that the European Commission has a broader and longer-term horizon compared to that of the member states regarding the conditions necessary for the sustainable growth of the area. For these reasons, the Commission better grasps the trade-offs among the various possible combinations of EPG-I and EPG-S. Thus, the Commission aims at ensuring that the outcome of the negotiations between the two countries does not lead to a grossly inadequate combination of EPG-I and EPG-S. In this respect, it would prevent that any attempt to reduce the technological delays of the EU compared to more advanced areas results in exacerbating internal divergences among member states. Vice versa, the Commission would make sure that any attempt to strengthen the European social model does not increase the EU innovation delays. Therefore, the Commission imposes two additional constraints on countries *1* and *2*:

(12) $E_I \geq E_I^{min}$

(13) $E_S \geq E_S^{min}$

Constraints (12) and (13) can be translated into a single constraint relative to ω because they are both satisfied if the value of ω is defined within the following interval:

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value of $\partial\omega^*/\partial\phi$ would become indeterminate. The economic explanation of this analytical result is quite obvious. Independently from the quantitative gap between Φ_1 and ϕ_2, the country with the higher bargaining power (let us assume country *1*) would never agree $\omega^* \leq 0.5$ and would impose the maximum ω^* compliant with the constraint (6). However, specifically in the case in which the values of Φ_1 and ϕ_2 were close, the sense of fairness could lead country *2* to refuse a value of ω^* asymptotically equal to 1. It follows that ω^* could have any value in the interval [0.5, 1].

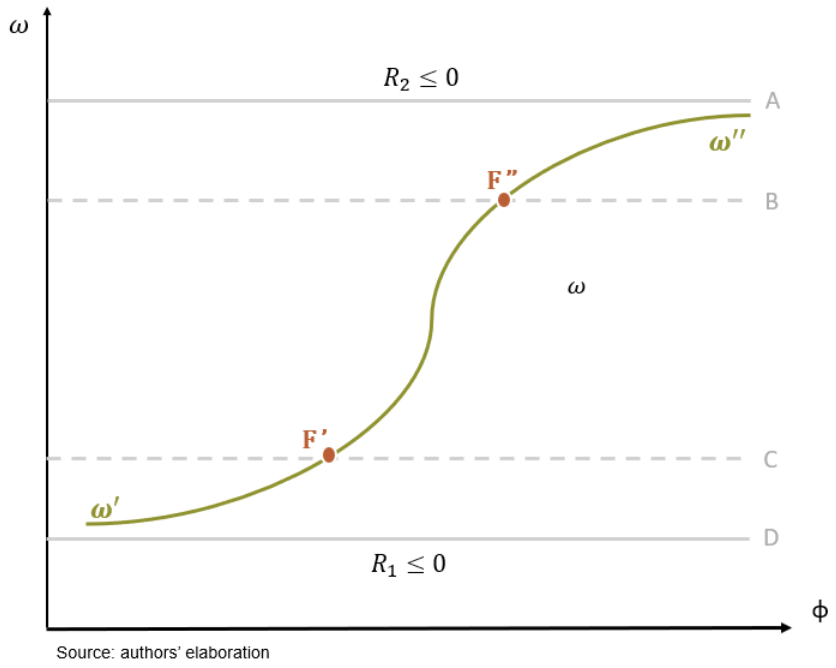
[15] It is sufficient to note that the relative values of the parameters a_i and b_i and the strict inequality of constraint (6) will imply that $(a_1 - b_1) > (b_2 - a_2)$ and $(b_2 - c_2) > (c_1 - b_1)$, unless c_1 is implausibly high. The last two inequalities state that the partial derivative (9) has the positive sign.

(14) $\omega_{min} \leq \omega \leq \omega_{max}$.

By adding constraint (14) to the dual constraint (6) in the maximisation problem defined by equation (7), it is possible that the previous equilibrium value $\omega*$ becomes unviable. In such cases, a second-best value of ω (ω^{sb}) must be set.[16]

From a formal point of view, we could rephrase the maximisation problem by determining the analytical solution of equation (7) subject to the constraints (6) and (14). Here it is more useful to complete our previous graphical representation by referring to Figure 4, which specifies the possible equilibria of ω^* (or ω^{sb}). The Figure connects the allocation between EPG-I and EPG-S (approximated by ω) to the relative bargaining power of the two countries (indicated by ϕ). Considering constraint (14) (see the curve ω′−ω″ in the Figure), the space F′−F″ of the possible equilibrium values of ω is determined. These values represent the equilibrium combinations between EPG-I and EPG-S. It should be noted that *below F′* and above *F″*, the curve $\omega'-\omega''$ would satisfy the dual constraint (6) which would become binding (i.e., the curve would become asymptotic) but not constraint (14). Therefore, these sections of the curve are notional.

Figure 4. EPGs: optimal combinations



AD = Area compatible with a positive production of EPGS in the two examined countries.

BC =Area determined by the additional constraint imposed by the European Commission.

Source: authors' elaboration

The results of our simple analytical model represent a step forward compared to the descriptive conclusions based on the combination of Figures 2 and 3 (see Section 2). The condition that makes a higher transfer of sovereignty advantageous does not change; however, the relative share of the

[16] If equation (6) continues to be non-binding, we will have $\omega^{sb} < \omega^*$ or $\omega^{sb} > \omega^*$ depending on whether the constraint (14) is binding because either of ω_{max} or of ω_{min}. Conversely, if the constraint (14) were not binding, the equilibrium value $\omega*$ would continue to hold.

EPG-I and EPG-S was treated as exogenous in our previous description whereas it is now endogenously derived. This share depends on the specific preferences and the relative bargaining power of each member state.

4. The relative position of EU member states

To move from the results achieved in the previous section to more specific findings regarding the European situation, we should identify the positioning of each EU country on the costs curve (Figure 2) and on the net benefits curves (Figure 3).

To determine the position of all EU countries on the curves described in Figures 2 and 3, it would be necessary to conduct a thorough comparative examination of the main economic and social characteristics of the individual member states. However, such an examination would be far too demanding.[17] As discussed above, we note that EU countries with relatively strong "national state" and "socio-economic" indicators should favour European centralisation, provided that their transfer of sovereignty leads to a greater supply of EPG-I. Conversely, EU countries with relatively weak indicators on both counts should favour the devolution of sovereignty to the European level, provided that this new setting leads to a greater supply of EPG-S. The choices applying to countries with indicators of intermediate strength are more nuanced. We limit our analysis to four EU countries: the three largest member states - Germany, France, and Italy - and Sweden as the EU country closest to the international technological frontier and to the full and effective implementation of the European social model.

First, let us consider the two polar cases. Sweden incorporates various salient features of the traditional Scandinavian model capable of combining an economy open to innovations, well-regulated but flexible markets, and high levels of social inclusion. Hence, Sweden can rely on the relative strength of its central state and intermediate institutions (the first of the two indicators used), as well as on the relative strength of its economy and its intermediate bodies (the second indicator). Conversely, Italy has a central state that delegates many competencies to regions and territorial entities and a bureaucracy characterised by pervasive inefficiencies. Hence, it has a relatively weak central state. The same applies to its economic and social strength: despite the competitiveness of Italy's medium-sized manufacturing firms in specific segments of the international markets and the leadership of a few of its large firms in European markets, Italy is characterised by structural economic fragilities (especially in traditional services) and by social tensions that are only partly mediated by intermediate bodies that often confine themselves to representing the particular interests of rent-seeking groups.

The characteristics of France and Germany are more complex to define.

[17] We should define a measurement of the two composite indicators (strength of the national state, and economic and social strength) utilised in Section 2, and then we should compare the consequent various measures of the different member states to specify their relative positions on the costs and benefits curves. The empirical apparatus needed to develop this promising perspective goes largely beyond the scope of this paper, because it would require careful case-studies on the economic, institutional, and social systems of each EU country or of a significant subset of these countries.

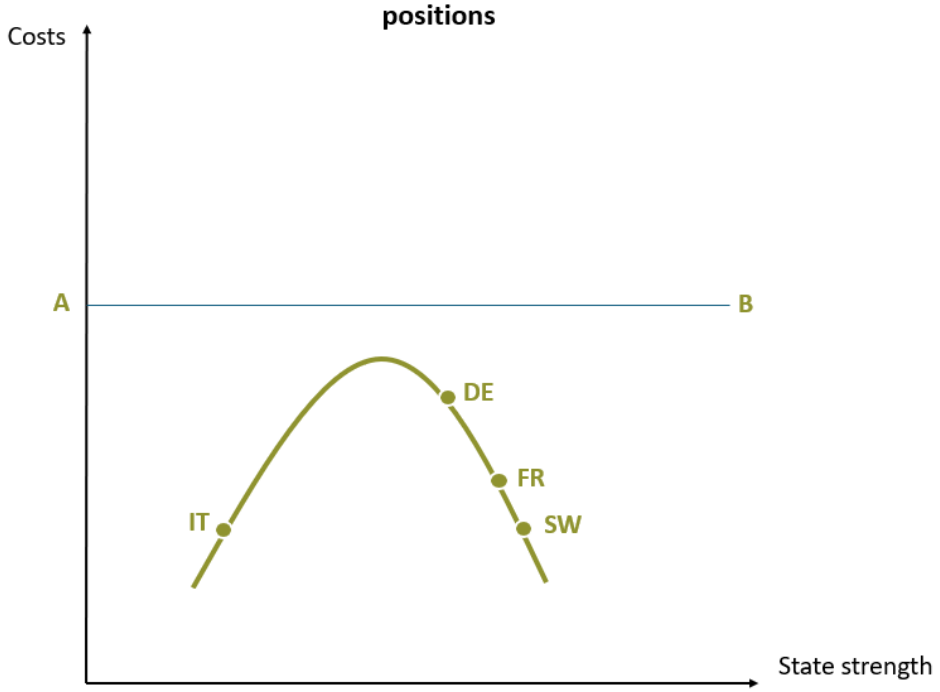
France has a highly centralised state with an efficient and well-structured public administration across the territory. Therefore, its first indicator (the strength of the national state) is above the European average and only moderately weaker than the corresponding indicator of Sweden. Moreover, the French production system, which is characterised by above-average shares of large industrial firms with significant potential for innovation and by a notable presence of advanced services, presents points of relative strength. However, these positive aspects are significantly offset by increasing production inefficiencies and substantial fiscal imbalances. Moreover, as pointed out by various authors since the 1990s (see e.g., Minc, 1995), in the last two decades of the 20th century France experienced significant fractures in its social cohesion. As of the early 2010s, the country had one of the lowest unionisation rates in the euro area (around 10% according to OECD data). In particular, the declining membership rate in collective forms of representation by workers from the private sector (now below 8%) has led national unions—and even more so—spontaneous forms of aggregation to pursue corporatist objectives. Even more than in Italy, in France the mediation of legitimate and conflicting interests of various social groups with the general interest of society has proven hard to achieve. Therefore, France has a much weaker economic and social indicator than Sweden, although—overall—stronger than Italy.

After reunification, Germany launched several structural reforms that were implemented at the national central level and absorbed in the economic system without severe social disruptions thanks to its strong intermediate bodies. These reforms reinforced the manufacturing, the federal structure and the role of other intermediate institutions. However, this process revealed inefficiencies in the planning, financing, and execution that were required for an efficient supply of tangible and intangible investment. Moreover, it did not sufficiently improve the production organisation of services. These inefficiencies were heightened by an overly orthodox approach to national budget discipline which led to widespread underinvestment. Besides causing a relative weakness of the German national state compared to France (the first composite indicator), these problems are also negatively affecting the evolution of the country's economic model.

In this last respect, we noted in Section 1 that post-pandemic bottlenecks on the supply side and the economic impact of geopolitical conflicts have undermined the main comparative advantages of the EU economy and exposed the fragilities of a growth process led by net exports. The European national economy most affected by these disruptions has been Germany. Hence, Germany’s economic potential has become inferior to Sweden's. However, also thanks to the presence of effective intermediate bodies, Germany’s economic and social strength (the second composite indicator) remains greater than that of France.

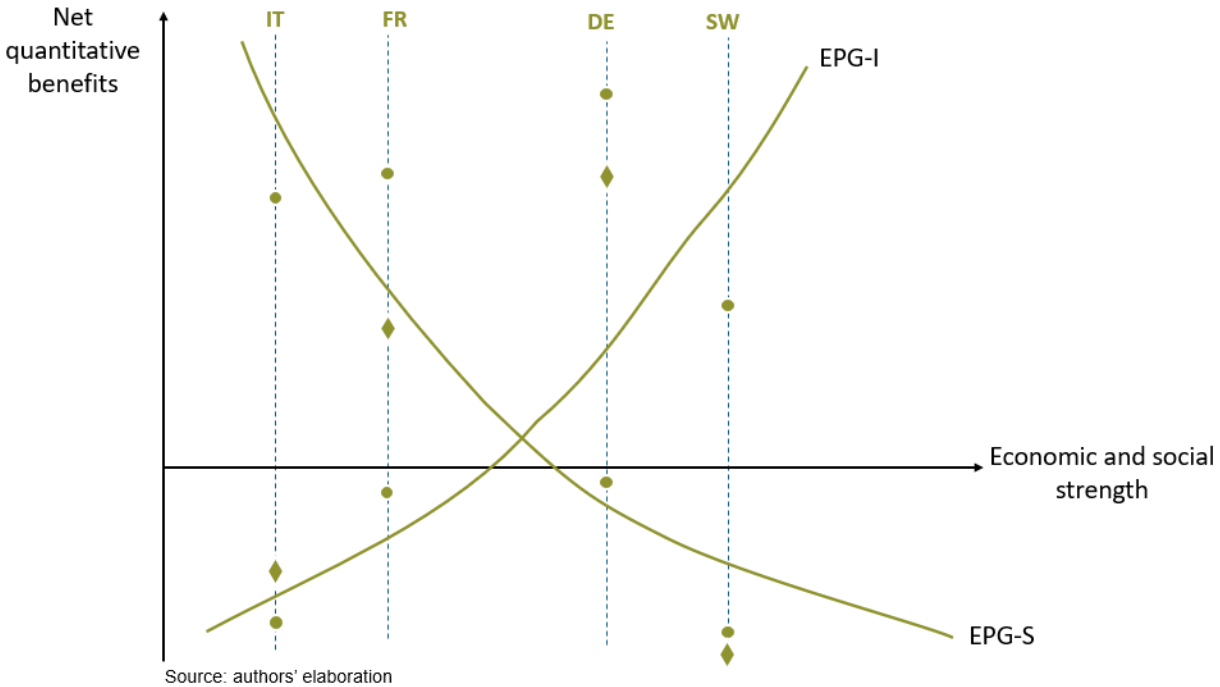
The comparison of the two composite indicators in four EU countries is summarised in Figures 5 and 6. The two Figures specify the relative positions of France, Germany, Italy, and Sweden on the costs and benefits curves in the face of a transfer of national sovereignty to the EU that allows for a predetermined production of EPGs. It is worth noting that Figure 5 is identical to Figure 2 except that the previous curve now highlights the points representing the four member states in terms of state strength and consequent costs due to the transfer of national sovereignty. Analogously, the two curves in Figure 6 reproduce those of Figure 3. However, the position of the four examined countries is also influenced by two additional factors specified in our simple model: (a) the different costs borne by each of the EU countries to ensure the future increase of 'own resources' to finance the given production of EPGs; (b) the different bargaining power of each member state that endogenously determines the relative share of EPG-I and EPG-S (see Section 3).

Figure 5. Costs of transferring sovereignty: country positions



Source: authors' elaboration

Figure 6. Benefits deriving from the two types of EPGs: country positions



Source: authors' elaboration

Each member state (*i*; with *i* = 1, 2,…) bears a specific cost (denoted by L_i^{OR}) to increase the 'own resources' or to jointly guarantee this increase; conversely, these costs were calculated at their average value (L^{OR}) in the two curves of Figure 3.[18] We also know that the shares of EPG-I and EPG-S, determined by the endogenous variable ω, influence the national specific benefits; conversely, in Figure 3, the two net benefits curves were based on an exogenous (average) value of ω. Hence, in Figure 6, the position of each of the EU countries also depends on the deviations of its specific ω and L_i^{OR} from the average (exogenously determined) values of ω and L^{OR}.[19] Our graphical representation mainly measures the impact that different national bargaining powers (ϕ), exogenously given, have on the benefits obtained by the four countries in terms of the distance of each of these countries from the EPG-I and EPG-S curves. The sum of each country's distance is a rough indicator of the additional net benefit derived by the bargaining power of that country in relation to the bargaining power of the other three countries.

5. The actual national preferences

France and—partly—Italy should demonstrate a high propensity to transfer sovereignty to the EU in exchange for a higher supply of EPG-S relative to EPG-I. Conversely, Germany and—partly—Sweden should demonstrate a high propensity to transfer sovereignty to the EU in exchange for a higher supply of EPG-I relative to EPG-S. These expectations are largely confirmed by the choices and public declarations of the political leaders who over the years have held governmental responsibility in these countries. However, the specifications introduced at the end of the previous section require further comments relative to Figure 6. As we already stressed, this Figure indicates that all the four countries are positioned outside the benefits curves. To highlight this aspect, let us compare the relative positions of Germany and Sweden as well as those of France and Italy.

The costs of transferring sovereignty should be lower in Sweden than in Germany because the Swedish state is stronger than the German one (see Figure 5). The opposite should apply to the net benefits because the Swedish economy can get higher advantages than the German economy from an additional availability of EPG-I. Finally, *prima facie*, the two countries should not show significant differences in terms of the national costs L_i^{OR}. However, confirming the attitude usually shared by the

[18] The supply of this required guarantee (cf. n. 7 and 11) is more costly for member states with a more solid public budget. Moreover, access to EPGs is equally available to all EU countries, whereas the financing of the consequent additional 'own resources' tends to be allocated proportionally to the national GDPs or other national indicators of economic strength. It follows that the costs for the direct or indirect coverage of the CFC cannot be treated as aggregate variables but must be specified for each member state. These costs are higher for stronger countries.

[19] Figure 4 has introduced a third novelty: the EPG-I and EPG-S are actual curves within the perimeter designed by the additional constraint introduced by the Commission (see equation 14); beyond that perimeter, these curves become notional. We assume that none of the EU countries is positioned on a notional section of these curves. A position on a notional section of just one of these curves would imply that this country does not find it advantageous to transfer sovereignty in favour of the EU.

northern member states (the Netherlands included), the Swedish government shows an even stronger resistance to transferring sovereignty to the EU than that of the German government. This evidence, which is matched by the deviations of these two countries from the curves of Figure 6, can be explained by the different bargaining powers of Germany and Sweden. Being the biggest and the dominant EU member state, Germany holds a bargaining power that is much stronger than that of Sweden. The difference in bargaining power more than compensates Germany's disadvantages in terms of sovereignty transfer. In other words, the German government expects that its relative disadvantages will be more than compensated by the combination of EPGs that will be closer to the optimal allocation for its economic system.

According to our analysis, this expectation is well-founded. Being the EU country with the greatest economic and social weight, Germany has exerted pressure on the decisions taken by the EU institutions for a long time. Therefore, the German government has a very high probability of facing an *ex-post* implementation of its *ex-ante* best combination between EPG-I and EPG-S. Therefore, it is understandable that the Swedish government attributes a high probability to the risk of having to handle *ex-post* negative surprises. For instance, given that Sweden's bargaining power is even weaker than those of the southern member states, the *ex-post* outcome could lead to a proliferation of EPGs-S; and having a high relative effectiveness in offering social services at the national level, Sweden greatly prefers to avoid that European institutions acquire the power of selecting and implementing these services.[20] Sweden opposes EPG-S because it conceives the related transfer of sovereignty in favour of the EU to be disadvantageous for its national interest (see Wyplosz, 2024).

Similar observations justify the relative propensity of France and Italy to transfer national sovereignty. For reasons deriving from its strong political tradition, the French government keeps a strong bargaining power in the EU. On the contrary, the historical institutional fragilities and the high level of the public debt to GDP negatively affect Italy's credibility within the EU and, hence, weaken its bargaining power. It follows that, other things been equal, France (Italy) shows a negative propensity to transfer sovereignty in favour of the EU that is lower (higher) than the propensity that should be determined by the two composite indicators in absence of any national differentiation in terms of bargaining power.[21]

In summary, European institutions are entrusted with mediating between the divergent interests of EU countries in terms of the allocation of the EPG types to be produced. A member state with modest economic size and low political capital meets strong limits in exercising its veto power against the production of the type of EPG which does not satisfy its interests. Hence, countries endowed with a strong national state and high economic and social strength but with low bargaining power tend to downplay the benefits of the production of EPG-I and to overestimate the costs of EPG-S. These

[20] This statement appears questionable because it apparently attributes a myopic behaviour to the Swedish government. The latter would have the opportunity to ally with Germany because the two countries pursue the common aim of supporting the production of EPG-I to the detriment of that of EPG-S. In this way, Sweden's low bargaining power would be supported by Germany's strong bargaining power. However, in real life we do not have a single type of EPG-I and a single type of EPG-S. Hence, given our previous analysis, Sweden would select EPG-I at the innovative frontiers and would refuse the centralisation of a large part of EPG-S, whereas Germany would appreciate EPG-I characterised by more mature technologies and would not oppose EPG-S overcoming the weaknesses of its welfare.

[21] In the case of Italy, we should also consider a further problem. The national institutions could underassess the weaknesses of the state and intermediate institutions, so that there would be an increase in the perceived cost of any sovereignty transfer in favour of the EU.

countries believe, rightly or wrongly,[22] that they enjoy a large degree of autonomy in the production of these public goods. This attitude implies an additional resistance in transferring national sovereignty in favour of the EU.

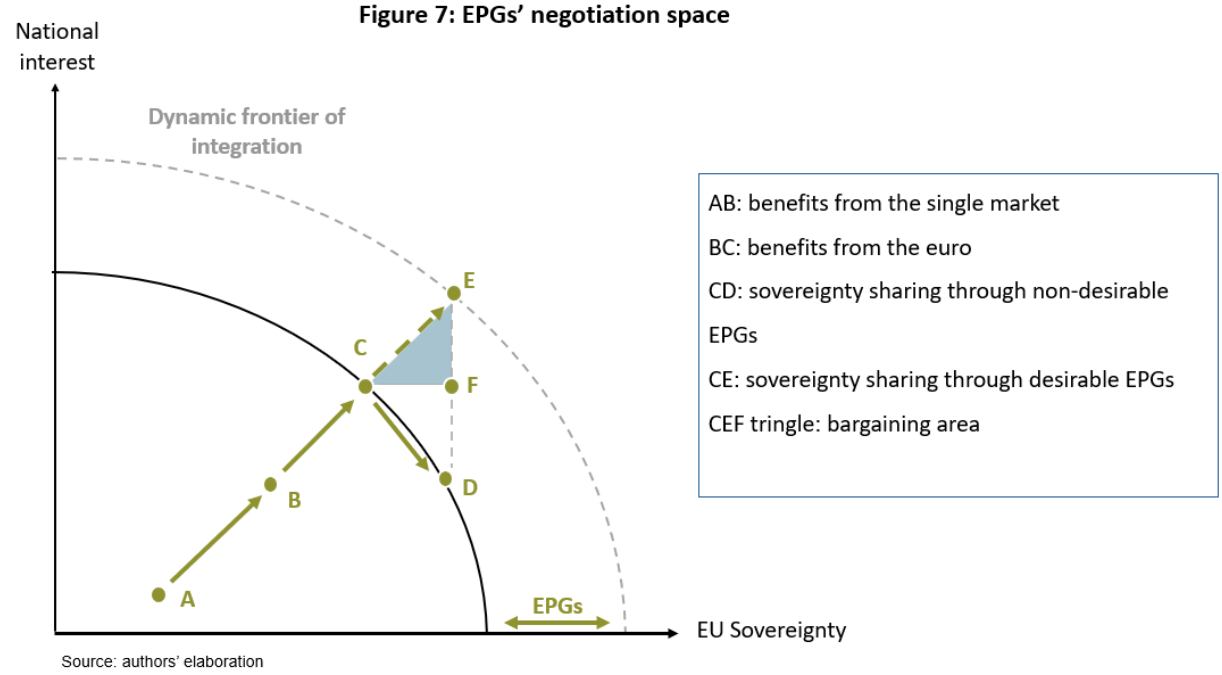
These considerations help explain why countries like Sweden (or generally those in Northern Europe) are content with the benefits of the single market (segment *AB* of Figure 1) and do not exploit the potential advantages that could be offered by adopting the single currency (segment *BC* of the same figure) or by pursuing deeper integration (segment *CE* of Figure 1 again). In other words, such member states do not position themselves on the integration frontier.[23] Symmetrically, EU member states with low economic and social strength and limited bargaining power tend to exhibit significant resistance to the transfer of national sovereignty, even when it is in exchange for centralised production of EPG-S. They fear that the *ex-post* combination of EPGs might excessively strengthen the supply of EPG-I, which would trigger disruptive national social conflicts due to the weakness of their intermediate bodies. Consequently, these countries condemn themselves to further delays relative to the innovative frontiers and exacerbate the divergences within the EU. They remain trapped in a static view of the integration frontier: in their perspective, the combination of the additional EPGs has a high probability of contrasting national interests (see segment *CD* of Figure 1).

Figure 7 revisits Figure 1 by illustrating in a more articulated manner the dynamics just described. Segment *CD* represents the outcome for a given country when the transfer of sovereignty at EU level results in the production of the "wrong" EPGs, i.e., EPG-S for countries with high economic and social strength and EPG-I for countries with low economic and social strength. Segment *CE* represents the positive outcome achieved by a given country when the transfer of sovereignty leads to the centralised production of the "right" EPGs, consistent with its national preferences. Most importantly, triangle *CEF* describes the negotiation space that leads to the reconciliation of preferences at the national level. No country will accept solutions below segment *CF*, that is, combinations of the two types of EPGs that result in a reduction of national interest. If a “defensive” attitude prevails, the equilibrium will be near point *C*.

[22] Rightly, in comparison with EU countries with a weaker national state and lower economic and social strength; wrongly, considering that none of the EU countries has the sufficient size to adequately exploit the high economies of scale and scope that characterise EPG-I and, even to a lesser degree, EPG-S.

[23] This statement apparently contrasts the European Treaties, which maintain that the adoption of the common currency (euro) is a compulsory and not discretionary move for the EU countries that meet predetermined economic parameters and that did not activate an opting-out clause at the launch of the euro (such as the case of Denmark). However, it is well known that countries such as Sweden would be in the condition to easily meet these parameters, therefore the entry option is a political decision.

Figure 7: EPGs' negotiation space



Source: authors' elaboration

Our analysis aims at maximising the supply of EPGs under the constraint of safeguarding the interests of each member state. In our graphical representation, this condition coincides with choosing a point as close as possible to *E* in Figure 7. In abstract terms, this equilibrium is given by the optimal combination ω of EPG-I and EPG-S resulting from the solution of the constrained maximisation problem for countries *1* and *2* set out in Section 3.

6. Conclusions

This paper is a first attempt to illustrate the factors intervening in the decision on the production of EPGs and the related transfer of national sovereignty to the EU. This raises questions that extend beyond purely economic considerations, encompassing institutional, political and social relations within the EU. It is not possible here to enumerate the many aspects that, due to their complexity, have not been adequately developed within our framework (for useful insights, see: Morlino *et al.*, 2020; Trigilia, 2024). Nonetheless, it is evident that further analysis and, more importantly, comparative empirical research across various EU member states are required. Below, we limit ourselves to highlighting the need for further investigation with respect to three specific areas and to outlining five preliminary policy implications.

We begin with the three areas requiring deeper analysis. First, the determination of robust relations between the different types of EPGs and the propensity to transfer national sovereignty in favour of the EU requires the re-elaboration of the definition and classification of EPGs. Second, it is essential to clarify the connections between EPGs and European industrial policy, which is crucial for transforming the EU's outdated production model. Third, it is necessary to better apprehend the connections between an efficient implementation of Next Generation-EU and the ownership of institutions and intermediate bodies regarding the National Recovery and Resilience Plans.

The five broad policy implications are the following.

First, EPGs must not lead to that 'transfers union' so greatly feared by Germany and the Nordic countries. In this respect, an example of EPG-S that does not go in this direction is offered by the SURE programme launched during the pandemic. SURE could be reactivated, imposing clauses for minimum investments in education and re-skilling of human resources. These investments would offer positive externalities for the dual transition (green and digital) in the EU economy.

Second, there is a way to overcome the resistance of transferring sovereignty to the EU by countries like Germany, which enjoy high economic and social strength but – due to the current difficulties – need restructuring processes and have a national state that is weaker than that of other member states. It is necessary that the selection of both EPG-I and EPG-S meets the condition of creating clear added value and resulting positive net benefits also for these types of EU countries that compensate for the high costs of sharing sovereignty. An example of an EPG with these characteristics would be the construction of a "European Railway Silk Road," ensuring fast and efficient connections across the EU for freight transport, thereby gradually abandoning road transport for distances above a given threshold (see Knapp, 2023). Such project would lower the environmental impact, overcome bottlenecks in logistics that also matter for advanced countries, and benefit fragile countries optimising the allocation of intermediate products in the value chains.

This conclusion highlights a third policy implication. It will be difficult to make the sharing of national sovereignty convenient, if the result is just the supply of an EPG with a given feature (either EPG-I or EPG-S); Therefore, a package of EPG-I and EPG-S has a better chance to fly, in particular if this package includes also projects that satisfy both features, such as the previous example of the European rail silk road.

It would be easier for a composite package to create adequate added value, if the most fragile member states managed to get closer to the technological frontier, thus increasingly reaping the benefits from EPG-I. This fourth policy implication can be pursued through two avenues. First, an efficient and effective implementation of National Recovery and Resilience Plans matters, especially in fragile countries. The fulfilment of this aspect is the responsibility of national governments, but it also depends on the 'deep' involvement of the intermediate institutions and bodies in the definition and implementation of the Plan's objectives.[24] Second, EU institutions should pursue the dissemination of innovative results achieved via the central production of EPGs. As the OECD has long pointed out (see: Andrews *et al.*, 2015), the set of European companies at the technological frontiers is too often poorly connected to the rest of the European economy and, therefore, does not trigger waves of imitation. This negative feature is due not only to a lack of competition, but also to the fragmentation of economic and social relations in the EU. A better dissemination of innovations and their benefits could be pursued by including an appropriate clause in the Important Projects of Common European Interest (IPCEI) programme as a condition for co-financing by the EU budget.

The previous point confirms the importance of pursuing initiatives at the EU level that would help reverse the widespread weaknesses of intermediate bodies. Hence the fifth policy implication states that, besides reducing the formalism that often dominates its procedures, the EU's social dialogue should make economic and social partners accountable to collective objectives and reaffirm their function of mediation between the state and the market

[24] See, for the Italian case, Messori (2022).

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