EU Budget Reform Options and the Common Pool Problem

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Abstract: There is a consensus in the literature that the expenditure structure of the EU budget is not in line with normative criteria based e.g. on the theory of fiscal federalism. While transfer policies have a large weight policies of a European public good type are neglected. Our contribution explains this inefficient outcome within the framework of a political-economic two-country model adapted from Besley and Coate (2003). The model's modifications integrate crucial features of the EU setting such as income heterogeneity of countries, a GNI dependent revenue formula and the existence of transfer policies in the EU budget besides both local and European public goods. We show that the common pool problem in combination with a budget cap is at the heart of overspending on transfers and underspending on European public goods. On the base of this model we assess different reform options related to the revenue side. We show that the effects of an EU tax depend crucially on the deviation of the specific tax base's redistributive effects from income proportionality. Furthermore, our results point to the advantages of a general but limited correction mechanism.

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1   Introduction

Although the current reform debate on the future of the EU budget is characterised by a variety of views there is a wide consensus that the current expenditure structure of the budget is not optimal. In particular, the overweight of transfer policies and the neglect of policies of a European public good type are regularly criticised (a well-known example is the Sapir report; Sapir et al., 2004).

In our contribution we offer a theoretical explanation for these deficiencies. For this purpose we adapt the seminal political-economic model by Besley and Coate (2003) who point to the possible coordination failures in centralised decision making. We extend this model by integrating important features of the European Union such as income heterogeneity, a GNI dependent revenue formula and the existence of transfer policies in the EU budget besides local and European public goods. In this model, the common pool problem is at the heart of inefficiencies in centralised decision making, as locally elected representatives decide on the allocation of spending at the central level which is financed out of a common pool, so that it is largely borne by other jurisdictions. As a consequence, local representatives face incentives to use their influence in central decision processes for promoting those transfers with an advantageous distributive effect from their country's position.

In the light of this model we analyse not only how certain characteristics of the status quo such as a cap on revenues impact on the incentives of local representatives. We also scrutinise the effects of several reform options which are being debated. In brief, it is shown that the introduction of a tax directly payable to the European level might even increase the relative attractiveness of transfers over public goods. By introducing a generalised correction mechanism a more efficient allocation of expenditures can be reached, shifting resources to the provision of EU-wide public goods. However, at the same time, this mechanism has a distorting effect for the ratio of local and European public good. Finally, the concept of a generalised but limited correction mechanism as proposed by Heinemann et al. (2008) is demonstrated to have advantageous properties if an appropriate differentiation of policies included in the correction formula can be achieved.

The remainder of this paper is organised as follows. Section 2 briefly surveys the literature on explanations given for the current neglect of European public goods in the budget. In section 3, we describe the theoretical literature which is our model's starting point. In section 4, the model is specified. In section 5, results referring to the status quo of the EU budget are depicted. In section 6, reform options for the own resources system are introduced and their

impact on expenditure policies is discussed on the basis of the model. Finally, section 7 concludes.

2   Explaining the allocation of EU expenditures

The allocation of EU budget expenditures with its focus on transfers has frequently been criticised. According to the theory of fiscal federalism, the budget of a supranational union such as the EU should be focussed on the provision of well-specified public goods. The literature on public good provision in international unions, building on the basic principles of fiscal federalism (see Oates, 1999), prescribes mainly two criteria which justify the assignment of tasks and resources to the central level: (a) economies of scale and (b) externalities. However, a harmonisation of policies might also have a negative effect, as the heterogeneity of preferences within a union increases with the number of citizens (Alesina, Angeloni & Etro, 2005; 2001a; 2001b). In their scrutiny of EU activities in different policy areas, Alesina, Angeloni and Schuhknecht (2005) find a mixed picture regarding the accordance of normative criteria and actual involvement of the EU: The involvement of the EU in certain policy areas, such as international trade or the common market, seems to be perfectly justified. Furthermore, the low involvement in other areas, such as education, research and culture, is backed by theory due to high preference asymmetries. However, several inconsistencies can be found such as the heavy EU involvement in agricultural policy and the existence of those regional funds which mainly favour better-off regions.[4] By contrast, several areas exist where theory would claim a higher involvement than can actually be observed, such as in certain aspects of international relations or migration issues.

This misbalanced involvement of the EU in the various policy areas is also reflected in the budgetary allocations.[5] The structure of the actual expenditure agreed for the period 2007-2013 can be seen in Figure 1. Apparently, two policy areas have dominated the overall expenditure over the past decades and still prevail: agricultural and structural policies. As it has frequently been criticised, these expenditures are difficult to justify on theoretical grounds and their efficiency is frequently doubted. Instead, they are dominated by redistributive motives (see Tabellini, 2003). These transfers arise as intercountry transfers (cohesion funds), interindustrial transfers (mainly to agricultural enterprises), or interregional transfers

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[4] This is the case for the "Regional Competitiveness and Employment Objective", one of the current objectives of structural spending.
[5] Note, however, that the budgetary structure is only a rough indicator of EU involvement since regulatory policies do not show up in budgetary numbers.

(targeting poorer regions). Although the resulting redistributive net transfers are to a great extent driven by differences in national wealth and thus by the motives of structural policies, de la Fuente and Domenéch (2001) show that even between countries with similar income levels differences in national net positions can be observed.

Figure 1: Allocation of expenditures of the Financial Perspective 2007-2013 (in bn. €)
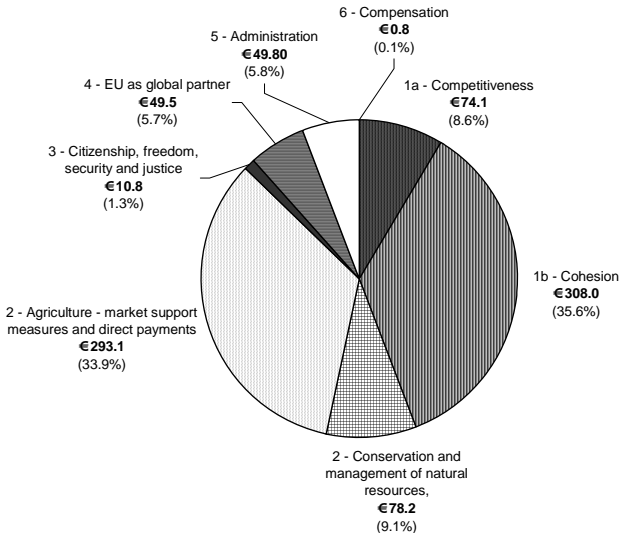
Source: European Parliament, European Council and European Commission (2006).

Given this budget structure, several authors like Tabellini (2003) or the Sapir commission (Sapir et al., 2004) have demanded a higher involvement of the EU in those policies which can be expected to create a European added value. This would imply a shifting of resources from the mentioned distributive spending to public goods in areas like international affairs, immigration or security policy (external aid, border controls), as well as R&D and innovation policies, hence areas, where economies of scale or positive external effects prevail.

As to the explanation of this inconsistency between normative criteria and the status quo mainly three different approaches can be found in the literature. A first approach regards the status quo as the outcome of a highly path dependent historical development (see Hix, 2005; Carruba, 1997; Blankart & Kirchner, 2004). According to this view, the cornerstones of the present system are the results of political bargaining in the past. Changes mainly occurred due to the fact that less integrationist countries demanded a compensation for new integration steps: for instance, the CAP served as a compensation for France in return for the opening of its market, and the cohesion fund as a compensation for the poorer countries in return for the introduction of the monetary union. Blankart and Koester (this volume) emphasise that

countries were successful in this regard whenever there was a credible threat to leave the EU at that time. All in all, the overall redistribution through the budget is interpreted as a compensation for those countries with lower or even no benefits from European integration (Hix, 2005). But even when the reasons underlying the compensations ceased to exist subsequently, it was hard or even impossible to remove them. Due to the unanimity requirement in the Council any changes could easily be blocked by the beneficiaries of such policies, which resulted in a "re-distributive deadlock" (Blankart & Koester, this volume).

A second strand of literature focuses on voting-power explanations. The empirical literature (Rodden, 2002; Kauppi & Widgrén, 2004; Mattila, 2006) shows that expenditure patterns favour the smaller member states which are overrepresented in the EU Council as well as in the Parliament. Smaller countries can use their influence to attract relatively higher returns from the main expenditure categories, such as CAP, structural funds and internal policies. However, this literature is only partly capable of explaining the distribution of funds within the policy areas beyond objective criteria, such as national prosperity or share in agricultural production, but it does not provide an insight regarding the overall expenditure structure of the budget.

A third relevant strand of literature is theoretical and devoted to the study of decision making in multi-layer systems of governments. It deals with the centralisation of activities in international unions and will be briefly surveyed in the next section. It becomes clear that this literature has so far not considered an overspending in some policy areas and underspending in others with respect to the unique institutional characteristics of the EU budget.

3   Related Theoretical Literature

While the early theoretical literature on fiscal federalism based on the seminal work by Oates (1972) mainly concentrates on the supply of public goods in federal countries, later contributions also deal with international unions whose purpose is the supply of a limited scope of public goods (Alesina et al., 2005; 2001a; 2001b). This literature mainly deals with the endogenous formation of international unions, focussing on their size, composition and scope. In these models, countries in international unions face a trade-off between the gains from policy coordination (due to spillovers or economies of scales) and its costs related to the loss of individual policy making. Then, the optimal formation of an international union might fail due to an inefficient provision of local public goods by the central level of the union. This inefficient allocation might be caused by several factors. Diverging preferences for public

goods between the countries can keep countries with lower preferences away from the international union in case the countries with higher preferences have the majority of votes, or it can lead to a larger, but less centralised union. If redistribution takes place within a union, because the member states differ in their prosperity, an inefficient composition of the union becomes possible since poor countries may not be allowed to enter (Alesina et al., 2001b). A decisive feature of these models is the voluntariness of participation in an international union. Therefore, these approaches take the size of a union as endogenous and mainly concentrate on the determination of the scope and composition of these unions.

A different explanation for inefficient centralisation was proposed by Besley and Coate (2003).[6] In their model, the size of a union is taken as exogenous and the assumption of a uniform allocation of public goods is softened. Consequently, inefficient levels of public expenditures are not caused by different preferences for public goods between the jurisdictions, but by the potentiality of a non-uniform geographical allocation of the local public goods. Depending on the applied decision-making rule at the central level, the result may either be an inefficient geographical allocation of these goods which is biased towards the jurisdictions whose representatives dominate decision making on the central level, or a general overprovision of public goods. Obviously, the former result is closely related to the well-known "common pool problem" of public good provision which is based on the literature of common choice (e.g., Shepsle & Weingast, 1981). In this public choice approach, the emphasis is placed on the tendency of central governments to overspend, because local representatives do not sufficiently internalise the costs borne by other jurisdictions when they demand for local public goods for their own jurisdiction.

In a similar approach, Lorz and Willmann (2005) focus on the endogenous formation of the degree of centralisation. By incorporating a continuum of public goods which differ in their degree of spill-overs and by endogenising the cost sharing, they show that the degree of public good provision is suboptimal low under strategic delegation, which contradicts the result of Besley and Coate (2003).

However, these approaches only explain one characteristic of EU spending at a time – overspending or underspending in some policy areas. Only a recent contribution by Dur and Roelfsema (2005), in a Besley-Coate-type model, finds an explanation for the coexistence of under- and overspending. This result is driven by the existence of non-shareable costs of local public good provision, i.e. costs which are not paid by the central level but by the local jurisdictions (e.g. environmental policy imposing costs on local industries or multilateral

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[6] For an extensive overview of related political-economic approaches, see Lockwood (2006).

peacekeeping with local casualties). If the share of these non-shareable costs is high (low), the delegated decision on the central level leads to undersupply (oversupply). The reason is that with high local costs local policy makers delegate bargaining to "conservatives" with a bias against spending on public goods. This stands in contrast to the original Besley-Coate result where the common pool aspect sets incentives to delegate public good lovers and thus leads to overspending.

However, although this contribution offers helpful insights to understand different degrees of centralisation of EU policies it still abstracts from institutional features of the European Union. Hence, in the following model, the focus will be on the integration of important characteristics of this specific European community of states.

4   The Model

Similar to the approach of Dur and Roelfsema (2005), several basic features of our model are borrowed from the workhorse model of Besley and Coate (2003). A two-region model is assumed, indexed by $i \in \{1,2\}$. Both regions are identical in population which has a mass of unity.

The utility of individual j in country i can be expressed by the following function:

(1) $U_i^j = x_i^j + \lambda_i^j [\ln(g_i) + \kappa \ln(g_{-i}) + \ln(G)]$;

x_i^j is consumption of private goods, λ_i^j is the preference for public goods, g_i is consumption of a local public good provided in country i, g_{-i} is consumption of a local public good provided in the other country, whereas κ denotes the spill-over which is assumed to be $\kappa \in (0,1)$ and equal for both countries. G denotes the provision of a Union-wide public good which is provided uniformly to all citizens of the Union; a feature which will be explained below in greater detail.

The utility for the public goods is strictly increasing and strictly concave and assumed to be equal for all individuals and both regions. In this regard, the model differs from the approaches quoted above, as individuals in both countries do not differ in their preferences for public goods. Instead, they differ in their income. The individual income y_i^j is equally distributed in both countries over an interval $\left[y_i^{min} ; y_i^{max} \right] \subset \mathbb{R}_+$, the median income in both

countries is denoted as y_i^m. The national income Y_i of country i results as the sum of all individual incomes in that country, so that $Y_i = \sum_j y_i^j$. In the following, it will be assumed that country 1 has a higher national income, so that, due to the assumption on the distribution of the incomes, the median income is higher as well, thus, $y_1^m > y_2^m$.

At least in one aspect this model is closer to resembling the traditional approaches of, for instance, Alesina et al. (2001a), than the political-economic models of Besley and Coate (2003) or Dur and Roelfsema (2005): We assume that a central decision on the provision of the local public good implies uniformity in the level of local public goods, so that $g_i = g_{-i}$. At first glance, this seems to be a strong assumption. In principle, it would be possible for the EU to enforce a provision of local public goods with differentiated quantities. However, reality resembles more a uniform provision of this spending category.

One prime example of this category is the "Territorial Cooperation Objective", one of the components of structural policies. This fund has a clear local allocation of spending, but is devoted to transnational and cross-border cooperation. Hence, it creates spill-over effects, so that it is a good example of a local public good. The allocation of the fixed EU wide amount for this objective follows a single criterion which is the number of citizens living in border areas. Therefore, it is not possible to unilaterally increase the spending in one country or jurisdiction alone. Procedures limiting the freedom of the central level to decide on local public good provisions exist in many other EU policy areas as well. A further example is the application of the excellence principle in the Framework Programmes for Research and Technological Development.

In addition to the existence of a local public good which corresponds to former models, a supra-regional public good (in our context a "European public good") is introduced, denoted as G, whose utility is again increasing and concave. This extension is of crucial importance since as mentioned above the neglect for European public goods is a central weakness of the EU budget's status quo so that a meaningful theoretical exposition must include this type of public good. Two properties differentiate local from European public goods. First, European public goods are non-excludable and non-rival from the perspective of member countries whereas local public goods are merely characterised by possible cross-border spillovers but not by full European non-excludability. Second, the relevant fiscal flows for local public goods can be attributed to member states, whereas expenditures for European public goods cannot. This differentiation is relevant for the analysis of reform options due to the different treatment of "allocated" and "non-allocated" spending in the EU accounting. "Allocated"

funds are taken account of in the calculation of country net fiscal flows from the budget whereas "non-allocated" funds are not. In the model, it is assumed that expenditures for European public goods are – in contrast to the local public goods and the redistributive expenditure – entirely booked as "non-allocated" by the EU. This corresponds to the actual treatment of policy areas such as external policies in the usual net balance statistics.[7]

The budget constraint of the individual can be expressed as following:

$$(2) \qquad x_i^j = (1-\tau)y_i^j + \theta_i^1 S^1 + \theta_i^2 S^2$$

The private consumption of an individual is financed from two sources: first, from individual income y_i^j minus a proportional income tax, denoted as a rate τ, which is paid to the central level. This setting is similar to Etro and Giarda (2007). The rate τ is initially assumed to be equal for all individuals and regions, and can therefore be regarded as a "GNI tax" on the aggregate level. This modelling corresponds to the GNI link of own resources payments in the current revenue system.

Second, transfers from the central level serve as a further revenue source. As an important modification to existing models, a share θ_i^k of payments from two redistributive policies S^k, k=1,2, allows the individual to finance private goods. This model feature represents targeted transfer payments from the central level which favour both countries to a different degree. This adjustment is motivated to depict the characteristics of EU expenditure policy with its dominant role of agricultural and structural spending. Both policies have negligible cross-border spill-overs or economies of scale, but mainly serve to transfer money to specific regions or groups of people. At the same time both spending items have highly different distributive profiles which largely depend on the size of a country's agricultural sector (for the Common Agricultural Policy) or the relative wealth of countries (for structural policies). In this regard, these redistributive goods are different from the local public goods which are characterised by interjurisdictional spill-overs.

Corresponding to these real life characteristics these payments are modelled as follows: it is assumed that for both policy areas the distributive pattern is given exogenously, while only the overall amount of payments in the policy areas is negotiable. This seems to be reasonable given the institutional setting in the EU, as the national allocation of the spending within the

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[7] We do not assume that these net balance statistics are good indicators of national welfare. However, the distinction between goods that can or cannot be allocated becomes important in the analysis how different correction mechanisms change the incentives of decision makers (see sections 6.2 and 6.3 below).

policy areas is largely rule-based. It is assumed that these two categories benefit the two countries in opposing directions, i.e. the category 1 rather benefits country 1: $0 < \theta_2^1 < \theta_1^1 < 1$, and category 2 is advantageous for country 2: $0 < \theta_1^2 < \theta_2^2 < 1$. For instance, the national shares of the expenditure might be determined by the share in agricultural production, the share in regions with lower than average wealth, or the share in regions with low population density.[8] Although these expenditures are usually earmarked in the EU, their treatment in the model as being purely redistributive payments which benefit all citizens of a country to the same degree is expedient. As these payments replace national public expenditure, which would be necessary to offset the beneficiaries if the policies were renationalised, the financing by the central level gives the national budgets leeway. This enables tax cuts, which are distributed to all citizens and increase their income which is disposable for consumption. However, as this implicit redistribution process is full of distortions (administrative costs, fraud, rent-seeking behaviour), it cannot be assumed that it is a zero sum game. Therefore, a cost term c is introduced in the budget constraint of the central level.[9] Moreover, the central level can provide the local public good at price p and the European public good at price q. The overall expenditures have to equal the revenues from the GNI tax, so the budget constraint of the central level yields:

(3) $\quad p(g_i + g_{-i}) + qG + S^1 + S^2 + c(S^1) + c(S^2) = \tau(\sum_j \sum_i y_i^j)$;

c is strictly increasing and convex: $c' > 0$, $c'' > 0$. In the following, we assume for simplicity that $c(S^k) = \dfrac{1}{2}(S^k)^2$.

The expenditure of the Union (the two local public goods, the interregional public good and the redistributive payments) are financed by the sum of the national contributions which are primarily denoted as a GNI tax as introduced above. This breakdown of the financing of the Union best reflects the current situation in the EU, where the bulk is financed via GNI proportional contributions. It should be pointed out that with this allocation, the financing is not divided 50:50 as assumed in the models described in section 3, unless the incomes of the median voters are identical which has been excluded above. The share of total contributions of one country, denoted as ψ_i, is calculated as its share in total national income, so that

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[8] In the following, the mere existence of the opportunity to redistribute payments to small interest groups or regions is taken as exogenous. However, its existence may be explained by lobbying for the provision of these goods. Recent literature indicates that lobbying for regional public goods provision is less costly under centralisation; see Bordignon, Colombo and Galmarini (2005).

[9] This simple handling of costs due to redistribution is similar to Acemoglu and Robinson (2005, p. 85ff).

$\psi_i = \dfrac{Y_i}{Y_i + Y_{-i}}$. This ratio is, due to the assumptions on the distribution of the incomes, equal

to the ratio of the median incomes. As it is assumed that country 1 is richer than country 2, the

cost-sharing in the status quo denotes that $\tau Y_1 > \dfrac{2pg + qG + S^1 + S^2 + \frac{1}{2}(S^1)^2 + \frac{1}{2}(S^2)^2}{2} > \tau Y_2$

for the two economies.

5   General Analysis

5.1   Social optimum

In a first step, the optimal level of public good provision is presented which can be obtained
by a central planner. This approach is referred to as the "standard approach" by Besley and
Coate (2003: p. 2615). It assumes the existence of a benevolent planner at the central level
who maximises the welfare of the individuals in both regions. As it has been assumed that the
median voter's preferences for public goods are identical in both regions, the following
function reflects the aggregate welfare:

(4)
$$V^S = \lambda^m((1+\kappa)\ln(g_i) + (1+\kappa)\ln(g_{-i}) + 2\ln(G)) + S^1 + S^2$$
$$-p(g_i + g_{-i}) - qG - (S^1 + \frac{1}{2}(S^1)^2) - (S^2 + \frac{1}{2}(S^2)^2)$$

The first order conditions give the following optimal allocation of the amount of goods
allocated on the central level, g_i, g_{-i}, G, S^1 and S^2 :

$$g_i = g_{-i} = \frac{(1+\kappa)\lambda^m}{p}, \; G = \frac{2\lambda^m}{q}, \; S^1 = 0, \; S^2 = 0$$

This reflects the well-known results that the optimal quantity of public goods rises with
increasing spill-overs and preferences for public spending, and decreases in the costs of these
goods, p and q. Moreover, the optimal amount of redistributive payments is zero in the model,
which is straightforward as due to its additional costs any positive provision of these
payments has a negative impact on the aggregate welfare.[10]

5.2   Decentralised decision making

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[10] Of course, this does not imply that redistribution within the European Union is per se inefficient. However, it
is this procedure of implicit redistribution which is highly inefficient; for an approach towards an optimal
redistribution between regions, see Bordignon, Melasse and Tabellini (2001). For further reflections on this issue
see section 6.4.

In this second step, the outcome of a decentralised provision of public goods is compared to the social optimum presented above. Applied to the European Union, this approach reflects the assignment of the provision of all of the public goods introduced above to the national level, so that each national government decides individually on its levels of provision.

The result is straightforward and in line with previous findings (see Dur and Roelfsema, 2005). As the spill-overs to the other countries are not entirely internalised in the national level, an underprovision of public goods is the consequence. The result is $g_i = \dfrac{\lambda^m}{p}$.

The results regarding the provision of the European public good, however, are ambiguous. Both countries decide independently over an amount G_i which they want to contribute to the interregional public good G. Usually, it is assumed that a country behaves strategically and incorporates the other country's provision in its decision, and vice versa. This model is similar to the problem of voluntary provision of public goods (see e.g. Mueller, 2003: p. 18). The result is a Cournot-Nash equilibrium, which implies the provision of a quantity of less than the Pareto-optimal quantity, and thus again an underprovision of the public good.

As in the social optimum, the provision of the two distributive goods S^1 and S^2 is likewise zero. Although intranational redistribution would not be excluded in the model, it does not take place due to the assumption of the uniform distribution of incomes. As a consequence from this assumption, the median income is equal to the mean income so that the median voter's utility would decrease with increased spending for these goods. In case of a skewed distribution, redistribution via the distributive good would become worthwhile for the median voter (whose income would then be lower than the mean income), and a positive amount of both redistributive goods S^1 and S^2 would be provided in the decentralised solution.

5.3   Centralised decision making with non-cooperative behaviour

In the following, the outcome of centralisation at the highest level will be modelled according to a simple political approach as proposed by Besley and Coate (2003). In the approach applied here, denoted as "non-cooperative" approach, it is assumed that decisions at the central level are made by a minimum winning coalition (MWC), which implies that the allocation of expenditures is executed by a coalition which gets at least 50% plus 1 vote of the representatives. As both jurisdictions are equal in size and voting power, the probability that each jurisdiction's representative will be in power is 50%. If he is in power, the representative will be able to fully benefit the median-voter of his jurisdiction with the spending from the

central level, while the costs of these policies will be shared between the jurisdictions. Hence, this cost-sharing rule is responsible for the common-pool problem in this setting, which has an effect as long as the regional public goods do not exhibit full spill-over effects to the other jurisdiction. Then, as a result of this non-cooperative model, two main drawbacks emerge: (a) a misallocation, because the spending mainly takes place in the jurisdiction of the representative who is in power, and (b) uncertainty, because the allocation of expenditures will not be known until the formation of the minimum winning coalition.[11]

This "non-cooperative" political economy approach, as introduced above, is now applied to the model sketched in the sections before. As citizens in the two jurisdictions differ only with respect to their income, citizens in both regions delegate the negotiation on the central level to a representative with median income. In the underlying solution concept, the representatives of both jurisdictions maximise their utility in the case of being in power, so that the median voter can expect the highest utility if his representative has control over the central policy.

The maximisation problem of the representative from country i can thus be stated as following:

(5)
$$V_i^m = \lambda^m[\ln(g_i) + \kappa \ln(g_{-i}) + \ln(G)] + \theta_i^1 S^1 + \theta_i^2 S^2 - \psi_i(p(g_i + g_{-i}) + qG$$
$$+(S^1 + \frac{1}{2}(S^1)^2) + (S^2 + \frac{1}{2}(S^2)^2))$$

First-order conditions give: $g_i^{opt} = \frac{(1+\kappa)\lambda^m}{2\psi_i p}$ and $G_i^{opt} = \frac{\lambda^m}{\psi_i q}$.

It can be seen that the provision of the local public good corresponds only to the optimal amount if both countries contribute equal shares to the budget, i.e. $\psi_i = \frac{1}{2}$, which reflects the case of both countries having the same income, so that both median incomes are the same. If this is not the case, as assumed before, the poorer country's representative chooses a too high amount of the good, the amount chosen by the richer country's representative is too low. This result holds for the European public good as well.

The first-order conditions for the redistributive goods are as follows:

$$\theta_i^1 - \psi_i(1 + c'(S^1)) = 0$$

$$\theta_i^2 - \psi_i(1 + c'(S^2)) = 0$$

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[11] Note that Besley and Coate (2003) introduce a further solution concept with a "cooperative" legislature. It shows that in case the decision being made by the representatives at the central level in order to maximise the joint surplus, a strategic delegation to a representative with higher preferences for public goods than the median takes place, thereby, leading to an inefficient oversupply.

Obviously, for agent 1 only the first equation can have an interior solution. As for the representative from country i in general $\left|\theta_i^k\right| < \psi_i$ for $k \neq i$, any positive amount of S^k would lead to net returns from the central budget which are smaller than zero, as the share of contributions he has to pay is in any case higher than the returns from the central level. For S^k with $k = i$, however, the outcome is a positive quantity. Then, the optimal amount is $S^k = \dfrac{\theta_i^k - \psi_i}{\psi_i}$.

At this point, the common pool problem enters the model: due to the existence of a good with a predetermined payment profile that exclusively favours one country, a higher than optimal amount of this good is provided because the benefited country has to contribute at a lower level to its provision than it benefits from it.

Furthermore, the results indicate that a certain degree of fiscal redistribution from the richer to the poorer regions exists even if the richer region's representative, agent 1, constitutes the minimum winning coalition and chooses the policy. As agent 1 always demands a positive amount of the regional public good g which is uniformly allocated to both regions, but pays a share larger than one half, he is (in an accounting sense) always a net contributor as long as this is not overcompensated by a high allocation of S^1, which will be excluded for simplicity in the following.

Obviously, these results crucially depend on the assumption of a uniform distribution of incomes. If this were given up, the outcomes may change significantly. If a region had a left skewed distribution, the median voter would choose an even higher quantity of the redistributive good which benefits his country, and it might even become profitable for him to choose a positive amount of the other redistributive good. Both outcomes depend on the distance of the median voter's income from the mean income. Moreover, the outcome regarding the provision of the public goods changes if both countries differ in the skewness of their income distribution. In case the richer country's income distribution is much more left skewed than the poorer ones so that the richer country's median voter is poorer than the poor country's median voter, then the richer country's representative will even choose a higher level of public good provision than the poorer country's one.

Note that in this setting, due to the assumptions made in section 4, inefficiencies do not arise because of an unequal provision of public goods as in the model by Besley and Coate (2003), or different preferences between the jurisdictions as, for instance, in Alesina et al. (2005). Instead, inefficiencies are caused by the way implicit redistribution takes place which enters the model through two channels: (1) The unequal participation in the financing (per head)

leads to non-optimal provision of public goods, even under the assumption of identical preferences and allocation of the public goods. (2) The existence of goods with predetermined distribution patterns allows the representatives to pursue non-efficient redistribution to a certain extent.

These specific arrangements of the model are in line with some observations for the EU budget discussed above. Redistributive transfer payments are higher than the social optimum, as it is shown in the model that the provision of these redistributive goods is larger than zero, while it should be zero in the social optimum. This is the equivalent of the misallocation outcome as found by Besley and Coate (2003). However, in this first step, it is not possible to explain the suboptimal low level of the public goods, which can even turn out to be too high in this approach.

5.4   Budget cap

Having derived the optimal choice of the median voter for the situation where he can decide on the policy, we proceed by introducing a further stage. In this first stage, the representatives of both regions might agree on an overall capping of the budget, i.e. they can agree on a maximum amount which the budget is not allowed to exceed. It is important that this cap cannot be overruled in the second step.

To fix this cap, both agents maximise their expected utility which arises from the decisions on the allocation made in the second step. Ex-ante, with a probability of 50%, this allocation is the allocation the own representative would choose (as determined in section 5.3), or, with a probability of 50%, it is the allocation the other region's representative would choose (denoted in the following with a hat).

Therefore, the expected utility for the representative from region i is ex-ante:

$$
\begin{aligned}
(6) \quad V_i^m = & \frac{1}{2}[\lambda^m((1+\kappa)\ln(g_i^{opt}) + \ln(G^{opt})) + \theta_i^k S^k - \psi_i(p2g_i^{opt} + qG^{opt} + (S^k + \frac{1}{2}(S^k)^2)] \\
& + \frac{1}{2}[\lambda^m((1+\kappa)\ln(\hat{g}_i^{opt}) + \ln(\hat{G}^{opt})) + \theta_i^{-k}\hat{S}^{-k} - \psi_i(p2\hat{g}_i^{opt} + q\hat{G}^{opt} + (\hat{S}^{-k} + \frac{1}{2}(\hat{S}^{-k})^2)]
\end{aligned}
$$

with k=i.

Note that the overall budget of the central level is the sum of all of its expenditures, which is in case country i's representative is in power: $e^{opt} = 2pg^{opt} + qG^{opt} + S^k + \frac{1}{2}(S^k)^2$. From the perspective of the representative from country i, in the first term of equation (6) his optimal level of e, e^{opt}, appears, because this represents the case in which he chooses his optimal

amount for every component. However, the second term's level of $e, \hat{e}_i^{opt}$, is in any case suboptimal from the perspective of country i's representative. Replacing the optimal quantities for the budget components with the amounts obtained in section 5.3, the optimal size of the overall budget in case country i's representative is in power yields to:

$$(7) \qquad e^{opt} = \frac{(2+\kappa)\lambda^m + \theta_i^k - \psi_i}{\psi_i} + \frac{1}{2}\left(\frac{\theta_i^k - \psi_i}{\psi_i}\right)^2$$

Thus, in case country i's representative is in power, the cap has to lie below the expression given in equation (7) to be binding. In order to disclose which policy-maker would be affected by the cap, it is important to consider the optimal budget sizes from the representatives' perspectives.

Deriving (7) for ψ_i results in $-\dfrac{\theta_i^k + (2+\kappa)\lambda^m \psi_i}{\psi_i^3}$, which is <0; deriving for θ_i^k yields to

$\dfrac{\theta_i^k}{(\psi_i)^2}$, which is >0.

Generally, for both regions, a capping of the central budget may serve as an insurance against a too high allocation of redistributive payments for the case in which the other region's representative can choose the policy. This argument becomes most obvious for the richer country: the optimum level of the budget decreases in the financing share ψ_i as shown above. Therefore, the representative of the richer country 1 could gain from a cap even in the absence of redistributive payments in favour of country 2, as his demanded level of public goods is smaller than the level preferred by the representative of the poorer country. Hence, he has an incentive to enforce ex-ante a capping of the budget at a level e^{max}, with $e^{max} < \hat{e}^{opt}$. However, the poorer country might gain from the ex-ante commitment as well to restrict the budget (especially if he is risk averse): the capping of the budget increases his expected utility if the redistribution to the richer country in case the other country's representative chooses the policy is not compensated by the advantages in the event of his own representative being in power. As the budget size increases in θ_i^k, the optimum capping for the poorer country can even be lower than for the richer country in case θ_1^1 is relatively large compared to θ_2^2. However, if the two distribution patterns, θ_i^1 and θ_{-i}^2, are identical in size (or do not differ too much), it can be concluded that the representative of the richer country 1 demands a stricter cap of the budget than his counterpart from country 2: $e_1^{max} < e_2^{max}$.

This approach offers an explanation for the existence of the budget cap in the EU, which has been introduced in 1988. In the new Financial Perspective 2007-2013, the total level of spending of the EU budget is capped at 1.048% of the EU's GNI. Reality also corresponds with the model insofar as mainly the richer member states stand for a lower level of maximal expenditure. In fact, in the run-up to the negotiations on the new Financial Perspective, some of the richest member states (Germany, Austria, Sweden, France, the Netherlands and the UK) even demanded a cap of the budget at a level of 1% (see Mrak & Rant, this volume).

When this capping below the optimal expenditure levels (e_i^{opt}) of both agents is taken as exogenous and when it is binding, it becomes obvious that in the second stage a suboptimal low level of public good provision results. Then, the resulting quantities are:

$$g_i = -\frac{(1+\kappa)((\lambda^m)^2 q(2+\kappa) + \sqrt{(\lambda^m)^2 q^2((1+2e^{max})(\theta_i^k)^2 + (\lambda^m)^2((2+\kappa)^2))}}{2pq(\theta_i^k)^2}$$

$$G = -\frac{((\lambda^m)^2 q(2+\kappa) + \sqrt{(\lambda^m)^2 q^2((1+2e^{max})(\theta_i^k)^2 + (\lambda^m)^2((2+\kappa)^2))}}{q^2(\theta_i^k)^2}, \text{ which are both increasing}$$

in e^{max}.

However, the ratio of allocation of the two kinds of public goods is independent from the question who chooses the policy, and it does not depend on the budget cap. This ratio is:

$\frac{g_i}{G} = \frac{q(1+\kappa)}{2p}$. This is in line with intuition, because the ratio of the marginal utilities,

$\frac{\partial V_i^m}{\partial g_i} \bigg/ \frac{\partial V_i^m}{\partial G}$, is identical for both representatives and it is independent of the financing share

(ψ_i).

The resulting quantity for the redistributive good S^k is:

$$g_i = -\frac{\lambda^m q\theta_i^k - (\lambda^m)^2 q(2+\kappa) + \sqrt{(\lambda^m)^2 q^2((1+2e^{max})(\theta_i^k)^2 + (\lambda^m)^2((2+\kappa)^2))}}{\lambda^m q(\theta_i^k)}$$

The breakdown between public goods and redistribution depends on several characteristics: as it has to hold that $\frac{\partial V_i^m}{\partial g_i} = \frac{\partial V_i^m}{\partial S^k}$, the allocation of public goods relative to redistributive spending increases with increasing spill-overs and public goods' preferences, and it decreases with a higher share of participation of the country in the redistributive spending.

For the individual utility maximisation it has yet to hold that the marginal utilities of the public good consumption equal the marginal utility of the private good consumption. Then,

the restriction in form of the overall budget capping at a level $e^{max} < e_i^{opt}$ results in a reduction of both private and public good provision.

All in all, it has to be noted that this institutional setting of a budget cap has positive and negative effects. On the one hand, the use of the redistribution channel is restricted by a capping of the expenditures, which increases the overall welfare. On the other hand, the provision of the public goods is reduced, and, disregarding the special case of this effect being overcompensated by the excessively high provision that was initially chosen by the poor country 2, it becomes suboptimal low.

6   Effects of reform options for the EU financing

In the reform debate, both sides of the budget are often regarded in isolation, so that remedies for spending inefficiencies are largely expected from measures addressing the expenditure side. One obvious approach is introducing national co-financing of EU policies which reduces the countries' incentive to pursue policies that mainly benefit their own citizens. This finding also holds in the model-based approach of Dur and Roelfsema (2003), who show that the use of a central tax and subsidy scheme results in a more efficient outcome.

In this section, it will be shown that the design of the revenue side might have a major impact on the national incentives on the expenditure side as well. For this purpose, the model developed above will be employed. In the following, three reform proposals for the revenue side of the EU budget are introduced, and their consequences on the allocation of the expenditures are scrutinised. The proposals include the introduction of (i) an EU tax, (ii) a generalised correction mechanism, and (iii) a generalised limited correction mechanism.

6.1   Introduction of an EU tax

The idea of the introduction of a tax which is directly payable to the EU, the so-called "EU tax", is the most far-reaching reform option in the discussion on a reform of the revenue side of the EU budget. In the past, it has received support from European institutions (see European Commission, 2004), but also from academics (Cattoir, 2004; Le Cacheux, 2007).[12]

Regarding its impact on the expenditure structure, one feature of relevance of an EU tax which is elaborated by Osterloh, Heinemann und Mohl (2008) can be analyzed within the

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[12] In the following, an elaborate discussion of the EU tax will be omitted; for a detailed illustration of different options for such a tax, see Cattoir (2004). For an extensive analysis of pros and cons arriving at a negative assessment see Osterloh et al. (2008).

given model: the distribution of national contributions would no longer be proportional to the national income as it tends to be the case under the current contribution scheme, but would follow a different pattern. This pattern would critically depend on the tax base. For instance, the choice of VAT would lead to higher contributions for countries with higher consumption rates, or a tax on kerosene consumption would put a higher burden on countries with major airline hubs or with an important share of the tourism industry.

To account for this effect in the model, the assumption of a contribution sharing according to the national GNI levels can no longer be maintained.[13] Instead, the national share of the contributions is determined by its share in the total base of the respective tax. This implies that the demand for public expenditures of the median voter, as determined in section 5.3, deviates from the point of departure if the national share in the tax burden, ψ_i^{tax}, differs from GNI shares, ψ_i. The following comparative statics are obtained: $\dfrac{\partial g_i^{opt}}{\partial \psi_i} = -\dfrac{(1+\kappa)\lambda^m}{2(\psi_i)^2 p}$ and

$\dfrac{\partial G_i^{opt}}{\partial \psi_i} = -\dfrac{\lambda^m}{(\psi_i)^2 p}$. This shows that the provision of public goods declines with the share ψ_i

that country i has to contribute to the central level spending. If the new allocation pattern due to the introduction of an EU tax is closer to a 50:50 ratio, the demand for public goods will be closer to the social optimum; if the gap between the contribution shares widens, the allocated amount of public goods will become more inefficient.

Comparative statics for the provision of the redistributive spending yields to $\dfrac{\partial S^k}{\partial \psi_i} = -\dfrac{\theta_i^k}{(\psi_i)^2}$.

Again, this is negative, which indicates that it decreases in the share ψ_i that country i has to contribute to the central level spending. Regarding the resulting level of redistributive spending, S^k, it is either possible that inefficiencies increase (in case the beneficiary countries are disburdened through an EU tax), or it is also possible that they decrease (in case the beneficiary countries have to spend more for the financing of an EU tax). Therefore, for any possible redistributive policy k, the outcome depends on the correlation between the change of the national contributions caused by the tax, $\psi_i^{tax} - \psi_i$, with the allocation of expenditures of the respective expenditure category, represented as $\theta_i^k - \psi_i$ in the model. If there is a positive correlation, those countries which benefit from the respective expenditure category

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[13] Note that Besley and Coate (2000) present a similar approach by endogenising the financing of the central budget. In contrast to our model, the choice of the tax base is made independently from the decision on the expenditure allocation.

would bear a higher burden of the respective tax than those who do not benefit from this category. Hence, the replacement of national contributions by the respective tax increases the costs for the beneficiaries. In the model, this results in a lower aggregate demand for the transfer policies (as well as lower total central spending). A negative correlation denotes that the redistribution through the respective category becomes even cheaper and increases the demand for it, which implies a further crowding out of public goods by redistributive spending under a budget cap.

This correlation can be examined in greater detail for the EU: in Table 1, the correlation coefficients for the most frequently proposed tax options and the two main spending categories, common agriculture policy and structural policy, are depicted. The change of the burden sharing caused by the taxes ($\psi_i^{tax} - \psi_i$) is estimated on the basis of the distribution of the tax bases as calculated in Osterloh et al. (2008). The allocation of spending ($\theta_i^k - \psi_i$) of the two expenditure categories is estimated for the year 2010 by means of a simulation model as introduced in Heinemann, Mohl and Osterloh (2008).

Table 1: Correlation Coefficients between allocation of expenditure and distributive effect of EU taxes.

	Value added tax	Cigarettes	Alcohol	CO2	Fuel	Kero-sene	Foreign exchange transactions
Agriculture	-0.05	0.75	0.59	0.66	0.43	-0.30	-0.39
Structural funds	0.12	0.65	0.94	0.75	0.57	-0.21	-0.26

Table 1 indicates that for any expenditure category, the sign and the extent of the correlation coefficient crucially depend on the selected tax base. For instance, the demand for agricultural spending would increase if a tax on foreign exchange transactions were introduced, but it would diminish in the case of a tax on cigarette consumption were chosen. It can be concluded that according to the model, an EU tax can cause either an increase in redistributive spending or a decrease.

6.2   Introduction of a Generalised Correction Mechanism

A further reform option is the introduction of a generalised correction mechanism (GCM). This option was originally proposed by the German Ministry of Finance in 1996, and it is elaborated in more detail in European Commission (2004). Its objective is to avoid an

excessively high burden for single countries by granting correction payments to the negatively affected countries through a partial reimbursement of their net contributions. The design of such a mechanism can be regarded as an extension of the existing UK correction mechanism: the GCM focuses on the net position of a country, which is calculated as the difference between the country's payments to the EU, and the EU expenditure which is allocated to the country. This difference is subject to a threshold a, expressed in % of national GNI. If this threshold is surpassed, a percentage b of any Euro exceeding this threshold is refunded to the country. This leads to correction payments for country i according to the following formula:

(8)
$$z_i = \begin{cases} 0, \text{if} \left[\tau Y_i - g_i - \theta_i^1 S^1 - \theta_i^2 S^2 - aY_i \right] \leq 0 \\ b \times \left[\tau Y_i - g_i - \theta_i^1 S^1 - \theta_i^2 S^2 - aY_i \right], \text{else} \end{cases}$$

The financing of this refund takes place in proportion to the national shares in total GNI. To simplify matters, in the following the refund is designed in such a way that the beneficiary country is excluded from the financing of its reimbursement,[14] so that in the two-country model automatically results in: $z_i = -z_{-i}$.

As it is assumed above that country 1 is in any case a net contributor, it invariably receives reimbursement payment from country 2, because the spending allocated to country 1 is lower than this country's contributions: $g_1 + \theta_1^1 S^1 + \theta_1^2 S^2 - \psi_1 (g_1 + g_2 + S^1 + S^2) < 0$. In the simplest case of a threshold fixed at a level of zero, the following utility function arises for the representative of country 1 in case he is in power:

(9)
$$V_1^m = \lambda^m [\ln(g) + \kappa \ln(g) + \ln(G)] + \theta_1^1 S^1 - \psi_1 (p2g + qG + S^1 + c(S^1))$$
$$+ b(\psi_1 (2g + S^1) - g - \theta_1^1 S^1)$$

The demand for the redistributive good S_1 yields:

$$S_1 = (\theta_1^1 - \psi_1 + b(\psi_1 - \theta_1^1))\psi_1^{-1}.$$

This is smaller than the amount in section 5.3, because $(\psi_1 - \theta_1^1)$ is negative and declines in the reimbursement rate b, so that the provision of the redistributive good shrinks compared to the status quo.

The optimal provision of the local public good is now: $g_1^m = \dfrac{(1+\kappa)\lambda^m}{2\psi_1 p - 2b(\psi_1 - \psi_2)}$. It can be seen that an increase in the reimbursement rate leads to an increase in the provision of the local public good.

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[14] In general, 3 rules for the financing are imaginable: (i) a full participation of all countries in the financing, (ii) a participation of all countries in the financing of all reimbursements except its own correction, and (iii) a complete exclusion of the receiving countries in the financing of all reimbursements, see European Commission (2004)

For the poorer country, the utility is now equal to:

$$
\begin{aligned}
(10) \quad V_2^m = {} & \lambda^m [\ln(g) + \kappa \ln(g) + \ln(G)] + \theta_2^2 S_2 - \psi_2 (p2g + qG + S_2 + c(S_2)) \\
& - b(\psi_1 (2g + S^2) - g - \theta_1^2 S^2)
\end{aligned}
$$

The demand for the redistributive good S^2 yields :

$$
S_2 = (\theta_2^2 - \psi_2 - b(\psi_1 - \theta_1^2)) \psi_2^{-1}
$$

As $(\psi_1 - \theta_1^2)$ is positive, the amount S^2 is smaller than the amount in section 5.3. Again, the incentive to choose redistributive spending diminishes with an increase in *b*, as country 2's representative internalises the worsening of country 1's net position for which it has to pay reimbursements.

For the local public good however, the optimal amount is: $g_2^m = \dfrac{(1 + \kappa)\lambda^m}{2\psi_2 p + 2b(\psi_1 - \psi_2)}$. This is

smaller than the amount in section 5.3. As a consequence, from the point of view of the representative of country 2, with increasing *b* the allocation shifts from the provision of the redistributive and the local public good to the allocation of the European public good. This is intuitive, as the former goods improve the net position of the poorer country at the expense of the richer country, and thus increase the reimbursements to the richer country.

Note that, independent from who constitutes the minimum winning coalition and chooses the policy, the provision of redistributive spending diminishes. The results for the local public goods are ambiguous: the provision increases compared to the status quo in case country 1's representative constitutes the minimum winning coalition, or declines in the other case. All in all, it can be concluded that given an exogenous capping of the budget exists, as discussed in section 5.4, the share of the redistributive payments diminishes compared to the public goods, which implies a shift towards the social optimum. However, the direction of the change of the ratio of local and European public good remains unclear. In any case, the socially optimal ratio as shown in section 5.1, where the marginal utility of the two public goods are equal in the equilibrium, can no longer be attained. Therefore, a misallocation between the two public goods is the result. Either the local public good provision is too high in terms of the interregional public good, or it is too low.

If this GCM were applied to the EU, one positive effect is evident: the incentive to attract redistributive payments diminishes for the net receiver as well as for the net payer. But at the same time, a misallocation between attributable and not attributable public goods might emerge.[15] In the model, the amount of the expenditures for the European public good G does

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[15] The differentiation between attributable and not attributable expenditure is of major importance for this mechanism. The link to the classification of expenditure actually applied in EU publications is as follows:

not have an impact on the correction z, so that in case the net payer constitutes the MWC, it can be expected that an introduction of a GCM leads to a shift from the local to the European public good.

6.3 Introduction of a Generalised but Limited Correction Mechanism

Finally, a further cutting-edge correction mechanism will be discussed: the generalised but limited correction mechanism (GLCM) which was recently introduced in the reform debate on the own resource system by Heinemann et al. (2008). The central idea of this mechanism is the same as for the generalised correction mechanism: all countries with an excessive net position are disburdened through correction payments (hence "generalised"). The difference to the GCM consists of limiting the expenditure categories which are taken account of in the calculation of the correction payments. Only the expenditures on some selected policy areas will be included in the calculation of the net positions that underlie the correction payments (hence "limited"). Heinemann et al. (2008) explicitly state that expenditures should be excluded which "can not be allocated to individual countries due to the nature of payments", as well as those which "may be identifiable but this payment structure is no sensible proxy for the share of country benefits from that policy". A prime example for the second category is expenditure which has public good properties, so that not only the country where the money is allocated benefits but other countries as well due to spill-overs.

In the model, this modification of the correction mechanism implies the exclusion of the local public goods g_i from the calculation of the correction payments, as these represent spending with public good properties. This changes the calculation of the correction payments to the following formula:

$$
(11) \quad z_i = \begin{cases} 0, \text{if} \sum_k \left[\dfrac{\tau Y_i}{\tau(Y_i + Y_{-i})} - \theta_i^k \right] S^k - aY_i \leq 0 \\[2em] b \times \sum_k \left[\dfrac{\tau Y_i}{\tau(Y_i + Y_{-i})} - \theta_i^k \right] S^k - aY_i, \text{else} \end{cases}
$$

The difference in the application of this mechanism compared to the GCM discussed above becomes obvious: as public good expenditures no longer appear in the calculation of the reimbursement payments, any interference of the correction mechanism in the decision on the

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Targeted redistributive payments as well as local public good provision are completely attributable to the countries; expenditures for the European public good cannot be allocated to individual countries. This reflects the share in the EU budget which is reported as "non-allocable" in the EU Financial Reports, which amounted to 8.57% of the total expenditures in 2006 (European Commission, 2007).

allocation of public goods is avoided. Consequently, the ratio of the allocated European public goods and local public goods is optimal under a budget cap, as shown in section 5.4.

At the same time, this mechanism has the same effect on the provision of redistributive spending as the GCM. It decreases with an increasing reimbursement rate b, exactly as shown in section 6.2. This property reflects the flexibility of this mechanism, as it allows a variety of allocations depending on the choice of the reimbursement rate, reflected in the model as the parameter b. If this parameter is set at the value of zero, the correction mechanism will be inactive, which resembles to the situation stated in section 5.3. If the parameter b is set at the value of one, redistribution via the redistributive payments S^k completely loses its desirability for both countries: any difference in favouritism between the two countries in the allocation of the redistributive good is immediately neutralised through reimbursement payments. In this case, any representative in power would choose a zero amount of redistributive payments, which would imply a complete shift to the provision of public goods as indicated in section 5.1. Eventually, if a value of b between zero and one is chosen, an allocation will result which lies between the non-cooperative solution and the social optimum. Thus, this mechanism has in common with the GCM that it reduces the incentives to strive for redistributive payments of both, net receiver and net payer, but in contrast to the GCM, the application of the mechanism does not distort the decision on the provision of the public goods.

6.4   Intended Redistribution in the Model

With its focus on the efficient provision of public goods, one weakness of the model presented above is that it does not offer much tolerance for the use of the budget for desired redistribution from poor to rich countries aside from the lower contribution payments of the poorer member state. In the real world, redistribution may be intended, for instance, for political or solidarity reasons, as it is the case in the European Union.

In the light of our model, a first obvious solution for intended redistribution in the EU would be the use of unconditional transfer payments which reflect the intended degree of redistribution. A second solution can be found within the GLCM: payment categories with an intended redistribution pattern can be excluded from the calculation of the reimbursements within the mechanism. As this is not possible in a GCM, a further disadvantage of this mechanism becomes obvious: since (intended) redistribution inevitably worsens the budgetary balance of the net payers, the introduction of a generalised correction mechanism with the aim to reduce the burden of the net payers would lead to a partial diversion of the payments. This

would even lead to the inconsistent effect that an increase of cohesion payments would only at a small part be paid by the richer countries (see Heinemann et al., 2008).

A further more sophisticated mechanism to align the efficient provision of public goods and redistribution targets in the European budget can be found in de la Fuente and Doménech (2001). In this approach, the national representatives agree in a first step on the net balances implying that they fix the degree of redistribution. In a second step, explicit expenditure programmes are negotiated, and, consequently, differences between the agreed and the actual degree of redistribution are corrected by lump sum transfers. In this approach, the decision on redistribution is successfully isolated from the decision on the allocation of expenditures, so that this approach also shows great promise for avoiding an interference of the common pool problem interferes with the decision on public good provision.

7   Conclusion

In this paper, a model based on the political economy approach with non-cooperative legislative behaviour of Besley and Coate (2003) was extended to explain in a first step the composition of EU expenditures, and in a second step, to identify the possible impact of reforms of the own resources systems on the allocation of the spending. The model was modified in order to allow for specific characteristics of the EU budget, such as the existence of income inequality and the existence of transfer policies with distinct distributive profiles. It was shown that the interaction of several institutional characteristics, i.e. the inclusion of targeted spending, the unequal financing by the member states and the capping of the overall expenditure, can provide an explanation for the bias of the budget towards redistributive payments and for an underprovision of efficiency-enhancing public goods.

Moreover, three prevailing reform options for the revenue side of the budget were analysed in this framework. It was shown that, apart from its fiscal consequences, the incentive effects of these reform options should not be neglected. While an EU tax might reduce the incentives to attract redistributive spending, it might also have a counterproductive effect depending on the choice of the tax base and its distributive consequences. A generalised correction mechanism is regarded as positive in this regard, as it generally implies a shift from redistributive to public good provision. However, it might distort the provision of different public goods, depending on whether they are included in the correction mechanism or not. Finally, a generalised limited correction mechanism has the most promising features, as it also implies a shift from redistributive spending to public good provision, without distorting the decision on the allocation between local and European public goods.

Concerning promising further research, the next logical step would be an extension of our model approach towards cooperative behaviour, as it was similarly introduced by Besley and Coate (2003). This paper is restricted to a non-cooperative legislature, which has the advantage of clearly demonstrating the different incentives of net payers and net receivers in the European budget. However, as Dur and Roelfsema (2005) argue, this kind of approach has certain disadvantages: since a non-cooperative behaviour is ex-ante suboptimal, it is advantageous for legislations with relatively few representatives (as it is the case in the EU) to commit to cooperation. This would insure both jurisdictions against the disadvantageous outcome in case the other jurisdiction's representative decides on the policy. This allows for a better insurance than the simple capping of the budget as discussed above. Moreover, the existing decision rules in the EU, which are often marked by unanimity, speak in favour of a cooperative legislature.

Independent from these possible extensions, our analysis demonstrates that a thorough incentive based analysis is indispensable for the assessment of both the status quo and available reform options for the EU budget.

Literature

Acemoglu, Daron and James A. Robinson (2005), *Economic Origins of Dictatorship and Democracy*, Cambridge.

Alesina, Alberto, Ignazio Angeloni and Federico Etro (2005), International Unions, *American Economic Review* 95 (3), 602-615.

Alesina, Alberto, Ignazio Angeloni and Federico Etro (2001a), *Institutional Rules for Federations*, Harvard Institute of Economic Research Working Paper No. 1940.

Alesina, Alberto, Ignazio Angeloni and Federico Etro (2001b), *The Political Economy of International Unions*, Harvard Institute of Economic Research Working Paper No. 1939.

Alesina, Alberto, Ignazio Angeloni and Ludger Schuhknecht (2005), What does the European Union do?, *Public Choice* 123, 275-319.

Besley, Timothy and Stephen Coate (2003), Centralized Versus Decentralized Provision of Local Public Goods: A Political Economy Approach, *Journal of Public Economics* 87, 2611-2637.

Besley, Timothy and Stephen Coate (2000), *Centralized Versus Decentralized Provision of Local Public Goods: A Political Economy Approach*, CEPR Discussion Paper No. 2495, London.

Blankart, Charles B. and Gerrit B. Koester (forthcoming), Refocusing the EU Budget – An Institutional View, *Public Finance and Management*.

Blankart, Charles B. and Christian Kirchner (2004), The Deadlock of the EU Budget: An Economic Analysis of Ways In and Ways Out, in: Blankart, Charles B. and Dennis C. Mueller (eds.), *A Constitution for the European Union*, 109-138, CESifo Seminar Series, MIT Press, Cambridge.

Bordignon, Massimo , Luca Colombo and Umberto Galmarini (2005), *Fiscal Federalism and Lobbying*, manuscript.

Bordignon, Massimo, Paolo Manasse and Guido Tabellini (2001), Optimal Regional Redistribution under Asymmetric Information, *American Economic Review* 91 (3), 709-723.

Carruba, Clifford J. (1997), Net Financial Transfers in the European Union: Who Gets What and Why?, *The Journal of Politics* 59 (2), 469-496.

Cattoir P. (2004), *Tax-Based EU Own Resources: An Assessment*, European Commission Taxation Papers, Working Paper No. 1/2004.

De la Fuente, Angel and Rafael Doménech (2001), The Redistributive Effects of the EU Budget: An Analysis and Proposal for Reform, *Journal of Common Market Studies* 39 (2), 307-330.

Dur, Robert and Hein Roelfsema (2005), Why does centralisation fail to internalise policy externalities?, *Public Choice* 122, 395-416.

Etro, Federico and Piero Giarda (2007), Redistribution, Decentralisation and Constitutional Rules, in: Breton, Albert, Gianluigi Galeotti, Pierre Salmon and Ronald Wintrobe (eds.), *The Economics of Transparency in Politics*, Ashgate Publishing, London, 209-230.

European Commission (2007), *EU Budget 2006 Financial Report*, Luxembourg.

European Commission (2004), *Financing the European Union*, Commission Report on the Operation of the Own Resources System, Brussels.

Heinemann, Friedrich, Philipp Mohl and Steffen Osterloh (2008), *Reform Options for the EU Own Resources System*, Heidelberg.

Hix, Simon (2005), *The Political System of the European Union*, 2nd edition, Palgrave Macmillan, Basingstoke.

Kauppi, Heikki and Mika Widgrén (2004), What determines EU decision making? Needs, power or both?, *Economic Policy* 19 (39), 222-266.

Le Cacheux, Jacques (2007), *Funding the EU budget with a Genuine Own Resource: The Case for a European Tax*, Notre Europe Studies No.57.

Lockwood, Ben (2006), The Political Economy of Decentralisation, in: Ahamad, Ehtisham and Giorgio Brosio (eds.), *The Handbook of Fiscal Federalism*, Edward Elgar Publishing, Cheltenham, 33-60.

Lorz, Oliver and Gerald Willmann (2005), On the endogenous allocation of decision powers in federal structures, *Journal of Urban Economics* 57, 242-257.

Mattila, Mikko (2006), Fiscal Transfers and Redistribution in the European Union: Do Smaller Member States Get More Than Their Share?, *Journal of European Public Policy* 13 (1), 34-51.

Mrak, Mojmir and Vasja Rant (forthcoming), Financial Perspective 2007-2013: Domination of National Interests, *Public Finance and Management*.

Mueller, Dennis C. (2003), *Public Choice III*, Cambridge.

Oates, Wallace E. (1972), *Fiscal Federalism*, New York.

Oates, Wallace E. (1999), An Essay on Fiscal Federalism, *Journal of Economic Literature* 37 (3), 1120-1149.

Osterloh, Steffen, Friedrich Heinemann and Philipp Mohl (2008), *The EU Tax Revisited: Should There Be One? And Will There Be One?*, EU-Consent EU Budget Working Paper No.6.

Rodden, Jonathan (2002), Strength in Numbers? Representation and Redistribution in the European Union, *European Union Politics* 3 (2), 151-175.

Sapir, André, Philippe Aghion, Giuseppe Bertola, Martin Hellwig, Jean Pisani-Ferry, José Viñals, Dariusz Rosati, Marco Buti, Helen Wallace and Mario Nava (2004), *An Agenda for a Growing Europe: The Sapir Report*, Oxford University Press, Oxford.

Shepsle, Kenneth A. and Barry R. Weingast (1981), Political Preferences for the Pork Barrel: A Generalization, *American Journal of Political Science* 25 (1), 96-111.

Tabellini, Guido (2003), Principles of Policymaking in the European Union: An Economic Perspective, *CESifo Economic Studies* 49 (1), 75-102.