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Abstract

The theory of fiscal federalism points out that decentralisation should be pursued in order to fit differences in individual preferences. However, the presence of externalities and the need of providing merit goods to citizens suggest that centralisation is likely to produce more efficient results. Moreover, in a political economy framework, each decision - including the possibility to fix a standard level of services - mainly depends on the objective function of the policymakers. Adopting this approach, the aim of this paper is to compare the individual convenience of a common standard level defined under a centralised system *versus* different provisions of public services when decisions are decentralised. Income heterogeneity across individuals is assumed.

JEL-Code: H700, H730, D310, D780.

Keywords: standard level of services, income concentration, decentralization, cooperative legislature.

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1. Introduction

In general, the reason for providing a common standard level of services in all regions within the same country lies basically in equity motivations or in the fact that supplying such levels allows fulfilling some basic individual rights and common needs. Merit goods (Musgrave 1957, 1987)[1] are an example where the State imposes compulsory consumption of certain services (such as in health care or primary education) generating interference problems with individuals' preferences due to a paternalistic attitude of the State. As it is known, one of the possible interpretations of this concept focuses on two main characteristics: the presence of external effects and a distorted set of individual preferences that might lead to either under or overconsumption (Liberati 2003). The introduction of the latter principle may undermine the fundamentals of the welfare theory, considering the State as a separate entity from the citizens, with its own purposes and needs which do not necessarily coincide with the will and tastes of individuals.

However, interferences with individual preferences appear to be a common trend in social life. Moreover, it should be said that some kind of interference occurs not only when we discuss public action and assistance, but it is also quite widespread in market relations (e.g., the role of advertising in "forcing" consumers' preferences). Hence, to justify the provision of goods satisfying needs not "included" in the traditional distinction between private and public goods and characterised by some "intrusion" of the State in individuals' preferences, philosophers, scholars and economists have tried to give some normative interpretations and theoretical responses.

Actually, the concept of "merit good" has been extensively revised in the literature that extended its traditional boundaries - such as externalities, paternalism and redistribution issues - and emphasised its role as a tool of the so-called "positive freedom" (see Chiancone and Osculati 1993). Following this approach, it seems to emerge that such goods are provided in order to guarantee - and not to impose preferences - some minimum rights (such as to health care, to education) that each individual should have to freely pursue his/her life projects (i.e., "enabling goods" or "functioning goods"; see also Bariletti 1993; Forte 1993; Granaglia 1993). According to Rawls (1971), for example, a standard level of primary goods should be provided to all citizens in relation to a justice-equity principle which basically implies a certain degree of equality of resources. Likewise, Sen (1980, 1987a, 1987b, 1992) also affirms that some commodities should be assigned according to a more general concept of equality of opportunity.[2]

From this viewpoint, public services such as social or health services should be provided to citizens at a certain common level. In this framework, the usual assumptions concerning heterogeneity in individuals' preferences seem to be not appropriate because of philosophical and equity reasons, and simply because the cultural context, which contributes to define the concept of equity and the rights of people, can be considered quite homogeneous within a nation, also implying homogenous preferences for goods and services that can fulfil these individual rights. Following this approach, the idea of the standard level of services differentiated across regions seems to be a sort of contradiction. However, the fact that regions can have (and collect) different (revenue) resources may imply a different provision of this kind of goods and services.

Generally speaking, the key issue remains how fiscal federalism can interact with the provision of public goods aimed at fulfilling individual rights when opinions and preferences for such goods are shared between local and central governments, and also among individuals. Local governments seem therefore an unnecessary structure, from a normative point of view, as it may well be conceived a central government directly providing uniform level of services. In this vein, intersection with federalism appears to occur at the lowest level: regions may act only as agents of the central government.

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[1] On this concept, see also Head (1966, 1969), McLure (1968) and Pulsipher (1971).

[2] For further details on the analysis of the equality principle according to Sen, see Granaglia (2007).

Yet, within a context of homogenous cultural values it is likely that central and local governments share this "merit good" argument - so no preference-revelation mechanism should be involved - and the idea on the appropriate levels of such services. In this case, regions can be also responsible for this kind of spending and set the efficient level, given different local resources. Indeed, it would be perfectly conceivable that regions will finance such services with their own resources. Thus, even though combining goods and services aimed at fulfilling individual rights with the theory of fiscal federalism is likely to be a hard task - and not yet much explored in the literature[3] - it seems more feasible when opinions and preferences for these goods are shared within the national territory.

Actually, this does not necessarily imply a uniform provision across regions as the amount of local resources and tax bases may be different, especially when income heterogeneity across individuals occurs. Hence, we try to revise, to some extent, the traditional trade-off between equity and efficiency concerning the opportunity/convenience of differentiating the provision of such public goods. In this framework, the degree of income inequality *between* and *within* jurisdictions can affect local governments' decision-making process, including the opportunity to fix (or not) a standard level of such services.

The aim of this paper is to suggest some possible explanations, on theoretical grounds, about the tendency of differentiating the level of such services within a political economy framework and investigate under which conditions it is convenient for individuals having or not such differentiated standards. In this framework, each decision is assumed to mainly depend on the objective function of the policy-makers and on the voting mechanism designed to select them. Hence, the politicians' election is also an important step for the story of the model.

Previous works have emphasised that the case for decentralisation has to be driven by political economy considerations. Seabright (1996), Lockwood (2002), Besley and Coate (2003) present models in which potential benefits of decentralisation are derived through endogenous choices under alternative political aggregation mechanisms. Bardhan and Mookherjee (1998) analyse alternative methods of delegating authority; in their model, a central government has limited ability to monitor the performance of the bureaucrats while in a decentralised system the local governments may be subject to capture by local elites. Besharov (2002) studies different regimes for the provision of local public goods in a "menu auction" common agency setting. In his model, the advantage of the decentralised regime is that it reduces influence costs.

In our case, policy is not negotiated by regional representatives as under decentralisation they decide independently; whereas under centralisation they are always assumed to cooperate (i.e., cooperative legislature as in Besley and Coate 2003). In this vein, our approach is similar to the most common utilitarianism approach which involves no conflict between different political groups or classes as argued by Sen (1973): "maximizing the sum of individual utilities is supremely unconcerned with the interpersonal distribution of that sum". The important feature of the model is that decisions regarding taxation and public goods are made simultaneously to solve the same maximisation problem of the elected policy-makers. These are the cases of "simultaneous centralisation" and "simultaneous decentralisation", as argued by Lundholm (2008).

Given this setting, we compare decentralised *versus* centralised solution[4] from an individual utility viewpoint. Indeed, each individual votes on centralisation or decentralisation of public goods provision and taxation, which implies a different policy mix in both cases. In detail, a common standard level will be defined under a centralised system, while different provisions of public goods and services are allowed when decisions are decentralised. The voting result for the institutional system mainly depends on how income varies across

[3] Some exceptions are included in Liberati (2003), where some theoretical aspects of the relationship between fiscal federalism and national health standards in Italy (LEAs) are extensively discussed.

[4] A variety of approaches has modelled the trade-off between decentralisation and other forms of more centralised policymaking within the national territory (e.g., Lockwood 2002; Besley and Coate 2003; Brueckner 2004; Goyal and Staal 2004; Janeba and Wilson 2010) and also during the breaking up of nations process (e.g., Alesina and Spolaore 1997; Bolton and Roland 1997; Spolaore 2008).

individuals *within* the same jurisdiction and *between* different regions. Indeed, income heterogeneity across individuals is assumed and this represents the only dimension of heterogeneity; in turn, the utility function is the same for individuals and preferences for such public services - aimed at fulfilling individual rights - can be considered homogenous (see also Hatfield and Miquel 2008).

Preferences heterogeneity is, to some extent, a sufficient (Oates 1972) but not a necessary condition (Seabright 1996; Besley and Coate 2003; Tommasi and Weinschelbaum 2007) to make a case for decentralisation, as other kinds of heterogeneity can be considered. Bolton and Roland (1997), for example, focus on redistribution conflicts and on differences in income distribution across regions as the source of breakup of nations, finding that when income distribution varies across regions, separation is likely to occur in equilibrium. More recently, Giuranno (2009), by analysing the relation between regional income disparity and the size of the public sector in a two-jurisdiction polity, shows that higher income disparities among regions (arising in some cases from the growing divergence between richer and poorer regions) intensify interregional redistributive conflicts, potentially leading to an under-provision of public goods.

To some extent, we also highlight the impact of interregional redistributive conflicts on public spending, stressing the importance of income disparities on the public policy decision-making process. However, a main difference between this paper and the Giuranno's model is that we do not always assume uniform public goods provision across regions, allowing for no policy uniformity at least under decentralisation. Moreover, we take into account both intraregional and interregional inequality, while only the latter effect is studied in his paper.

From a positive viewpoint, our main findings are that it is more likely to vote for decentralisation without a common standard of public services when: regional per capita income is higher than the average (according to a "tax base factor" also found by Bolton and Roland 1997); income inequality *between* regions is high. The last result appears to be in line with some empirically observed institutional conflicts across regions about different level of redistribution (notable examples are in Italy, Spain and Belgium). On the contrary, the impact of *within* income inequality is more ambiguous as it has an opposite effect on taxation and public spending, affecting the choice of the institutional system in a different way. Finally, rich and poor people find a different convenience of voting for a common standard level of public services provided under a centralised system, revealing to some extent different attitudes and "preferences" for redistribution. Yet, this result does not hold for each value of *within* income inequality. Indeed, we find that rich and poor individuals are willing to vote for the same institutional setting when income distribution worsens within their region.

The remainder of the paper is organised as follows. Section 2 outlines the general theoretical framework of the model. Section 3 and 4 describe decentralised and centralised case, respectively. Results and their discussion are presented in Section 5. Finally, Section 6 offers some concluding remarks.

2. The general model

In this section, we describe the general features of the model, which hold under both institutional settings (centralisation and decentralisation) in order to compare a common standard level of services, which emerges under a centralised system, with different provisions of public goods and services when decisions are decentralised. In the first case, public policy is defined by a cooperative legislature (as in Besley and Coate 2003) where all local policy-makers cooperate in order to maximise their joint utility functions; in the second case, public policies are chosen independently by the elected representatives in each region. In a political economy framework, each decision - including the possibility to fix a standard level of services - mainly depends on the objective function of the policy-makers and on the voting mechanism designed to select them. Hence, the choice of providing, for example, different or equal amount

of public goods across regions reflects the convenience of the decision-makers, which can be also different under either regime.

In detail, we present a model of public finance similar to those of Persson and Tabellini (2000) and Giuranno (2009), where the policy to be determined concerns the level of government spending, which benefits all voters alike. A polity with *N* individuals divided into *J* different districts, each with its own local government and different population size (n_j), is considered. Income is the only dimension of heterogeneity across citizens, while preferences for public goods are assumed to be homogenous ($0 < \beta < 1$) within the national territory. Instead of considering citizens' preferences as a source of heterogeneity, we focus on a different element in order to explain the voting result for the institutional setting.[5]

As in some previous studies (Seabright 1996; Besley and Coate 2003; Tommasi and Weinschelbaum 2007), we do not necessarily require heterogeneity *a la* Oates (1972) to make a case for decentralisation. Indeed, many public goods - similar to "merit goods" - lack substantial taste heterogeneity (see also Hatfield and Miquel 2008). This can basically due to the fact that differences in preferences for such provision are usually weak as this kind of services are aimed at fulfilling individual rights that are considered valuable to protection by everybody, especially within a homogenous cultural context (Rawls 1971; Sen 1980[6]).

Following this reasoning, we assume that each citizen i has the same quasi-linear preferences over private consumption (c_j^i) and public goods (G_j) provided by his/her region *j*, which is given by:

$$U_j^i = c_j^i + \beta \ln G_j \qquad (1)$$

We consider a quasi-linear utility function to ensure that there are no income effects in the enjoyment of such public goods. Hence, government spending is provided equally to everyone within the same jurisdiction, so that $G_j > 0$.[7] Actually, different public good provisions can be implemented across regions according to heterogeneous income distributions and available local resources. Indeed, richer regions could, for example, provide a higher level of public goods imposing a lower tax rate (Boadway and Hobson 1993).

Any tension in deciding the provision level will thus come from the use of taxes that differently affect citizens. Indeed, each local government finances public goods by levying a proportional income tax rate ($0 < t_j < 1$), which will be differently defined under the two institutional systems. Hence, individual's private consumption is equal to private income ($y_j^i > 0$), which represents the initial endowment of each individual, minus the cost of the public policy:

$$c_j^i = (1 - t_j) y_j^i \qquad (2)$$

[5] As we have demonstrated in a previous paper (see Fiorillo and Sacchi 2011), a different source of disparity among regions - such as their population size in that case - allows challenging the traditional findings according to which higher heterogeneity should basically enhance more decentralisation.

[6] Our hypothesis is more consistent with the functioning issue rather than the capabilities one.

[7] The choice between centralised and decentralised provision does not compromise the existence of this minimum value in both cases. Indeed, individual comparisons are involved on amounts beyond this threshold which is always guaranteed.

As a matter of fact, allowing each community to design and implement its own distinctive blend of policies also implies a system of differentiated taxes that would depend on regional income. Such differentiated tax rates are determined and imposed separately by each local authority under decentralisation and jointly by all regions under centralisation. The latter represents a case of regional cooperation where politicians of all districts are assumed to cooperate and choose not to differentiate inhabitants in terms of taxation, setting a unique tax rate ($t_j = t$) to finance the sum of public good provisions in all jurisdictions. Thus, the equilibrium tax rate under centralisation will not coincide, in general, with the tax rate chosen by the elected candidate in each region. Broadly speaking, cooperation imposes some institutional constraints similar to those existing within a unified nation, where regions do not have total freedom in their choice of tax policies (see, for example, Bolton and Roland 1997).

Local administrations use their revenues to provide local public goods to citizens belonging to their jurisdiction. The government budget constraint is then simply the sum of income revenues collected within region that are also assumed to be equal to the total cost of providing public goods and services. In both cases, public policy is an "active" government intervention that has a cost. We assume, for simplicity, that the unit cost of the public good is the same across regions under both scenarios (see also Oates 1972)[8] and that it takes into account the government spending in all regions, like the average cost relating to the total public provision in the economy:

$$\alpha_j = \alpha = \left(\prod_{j=1}^{J} G_j \right)^{-\frac{\gamma}{J}} \tag{3}$$

where γ - satisfying the condition $0 < \gamma < 1$ - captures the presence of positive externalities related to the production cost of public policies across local jurisdictions (externality production). For instance, the cost of providing social services (i.e., hospitals) decreases when other regions provide a good level of these services as congestion problems, for example, should not arise in this case. In other words, regions can pay less to finance this kind of goods if others - especially neighbouring - supply similar services. The parameter γ is a measure of the average spillovers effect deriving from the mix of public goods provided by local governments. It allows the reduction in production costs of government spending as each local policy-maker can exploit these beneficial effects by paying less for providing public goods to his/her community (see also Fiorillo and Sacchi 2011). Higher is the average scale of services provided, $\left(\prod_{j=1}^{J} G_j \right)^{\frac{1}{J}}$, lower is the production cost. In other words, γ can be interpreted like both externality and scale indexes.

The timing of the model is as follows. Each individual votes on centralisation or decentralisation; the final outcome emerges according to the simply majority rule.[9] In the second stage, a politician is chosen within each region. This is modelled as a citizen-candidate game (Besley and Coate 1997), where citizens stand for election by committing to platforms that they prefer themselves *ex post*. Candidates are evaluated comparing their proposals on tax and spending policies; then, the policy-maker is elected on the income basis as income is the

[8] If it is not the case - for example, if under centralisation important economies of scale in the provision of the good, that are not available to local governments individually under decentralisation, can be realised - centralisation may be desirable for cost-savings reasons.

[9] Note that our analysis only shows which institutional setting citizens would prefer given exogenous conditions, but the actual prevailing system will depend on how individual votes are weighted and aggregated at the national level.

only difference across individuals and can determine a different policy mix to implement. Finally, the elected candidates set both the level of public spending and the corresponding tax rate to finance it.

The important feature of the model is that decisions regarding taxation and public services production are made simultaneously to solve the maximisation problem of the elected policy-makers. This case could be similar to the concepts of "simultaneous centralisation" and "simultaneous decentralisation" developed by (Lundholm 2008). The former reflects the standard assumption in the literature according to which public decision making is centralised and coordinated in the sense that decisions about the structures of taxation and public expenditure are made simultaneously by the central government. However, centralisation can be also when both the decisions, about which projects to fund and which tax setting to finance them, are made by a legislature that comprised of delegates from all regions, as defined by Lockwood (2002) and Besley and Coate (2003).[10] We follow this approach in analysing the centralised case. In turn, "simultaneous decentralisation" is opposite to that of "sequential decentralisation" of public goods production decisions, where public goods production is delegated to a subordinate bureau, whereas decisions about taxation are taken by the central government (Lundholm 2008).

In next sections, we describe the choices of public spending and taxation level under a decentralised system and a centralised one in a separate way. As in Lockwood (2002), the difference between decentralisation and centralisation concerns the financing mechanism: in the former, public goods provision is funded by a proportional regional tax with different tax rates (t_j); in the latter, decisions about uniform tax rate setting (t) on all citizens are made by a single legislature representing the cooperation among politicians of all regions. Indeed, under centralisation we assume a cooperative solution among local decision-makers as in Besley and Coate (2003), without considering the non-cooperative case.[11]

Hence, they agree to the public goods allocation that maximises their joint welfare (see also Weingast 1979; Fitts and Inman 1990). According to the central tenet of the *Public Choice* approach, decision-makers are assumed to be utility-maximisers with their own objective functions in both cases. Thus, the general approach we adopt is to find the taxation level and public spending which maximise the elected representative's welfare subject to the government budget constrain.

This political decision-making process can be solved for *backward induction*. Thus, we first derive the level of public goods and services and taxation set by the elected politician; then, we turn to the voting stage, solving the citizens' selection problem of representatives and finally, we compare decentralised *versus* centralised solution from the individual utility viewpoint. The analysis of each scenario is separately performed.

[10] Actually, in this framework there can be also two alternative types of "partial centralisation": the first is "centralised expenditure", where projects are decided upon by central government, but are funded by regions; the second "centralised funding", where projects and policies are decided upon regionally, but funded through a national tax (Lockwood 1998).

[11] Coasian logic (i.e., Wittman 1989) suggests that legislators should find their way around the inefficiency created by majoritarian decision criteria under the minimum winning coalition, usually associated with the non-cooperative legislative behaviour. This theoretical observation, coupled with the empirical evidence where - at least in the United States - minimum winning coalitions for this type of spending seem the exception rather than rule, has led many scholars to abandon this view of legislative behaviour in favour of more cooperative approaches.

3. The decentralised case

3.1. The choice of public spending and taxation

Under decentralisation, policies are chosen simultaneously by the elected representative in each district.[12] Representatives are characterised by their utility function (U_j^d) and their income (d_j). As described above, the only issue of heterogeneity across individuals is income.

When each local government controls its own taxes as well as the expenditure levels for its residents, the government budget constraint is then simply:

$$t_j \sum_{i=1}^{n_j} y_j^i = \alpha G_j \tag{4}$$

where the left-hand side of equation (4) represents the sum of all income taxes collected within the local jurisdiction; this sum is assumed to be equal to the total cost of public goods supply.[13]

We can now write the maximisation problem of the policy-maker as follows:

$$\max_{G_j, t_j} U_j^d = (1 - t_j) d_j + \beta \ln G_j \qquad \text{s.t. (3) and (4)} \tag{5}$$

Solving expression (5) yields:

$$G_j(d_j) = \frac{Y_j}{d_j} \left(\frac{J\beta}{J - \gamma} \right)^{\frac{1}{1-\gamma}} \left(\prod_{k=1}^{J} \frac{Y_k}{d_k} \right)^{\frac{\gamma}{J(1-\gamma)}} \tag{6}$$

$$t_j(d_j) = \frac{\beta}{d_j} \frac{J}{J - \gamma} \tag{7}$$

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[12] The assumption according to which a single representative makes decisions also in a decentralised system is a simplification trying to capture the reality that there will be a greater commonality of interest across sub-districts than across district, even if in the real decentralised institutional setting decisions are typically made by legislatures consisting of elected representatives of each of the sub-districts of the district.

[13] Under decentralisation, intergovernmental transfers (of both vertical and horizontal types) are excluded from the model as we assume that local taxes, levied to finance public services, are allocated on a sort of benefit base. In this case, no central or interregional equalisation should be needed (Musgrave 1961). On the other hand, indirect or direct forms of compensation schemes are better allowed under centralisation. Moreover, we assume for simplicity neither tax evasion nor deadweight losses usually involved by (income) taxation (see, for example, Bolton and Roland 1997). As noted before (see footnote 7), each local government is able to provide at least the minimum level of G_j.

where $Y_j = \sum_{i=1}^{n_j} y_j^i$ is total regional income. Both public goods and taxation levels negatively depend on the representative's income because of the marginal utility of public services with respect to the marginal utility of income. Moreover, they both increase with the scale effect as it allows the reduction costs of public services, enhancing a sort of substitution effect.

3.2. The election of the policy-maker

According to the citizen-candidate approach, voters elect candidates whose policy satisfies their utility functions. As individuals differ only for personal income, the policy-maker selection is based on this variable. The maximisation problem of the generic individual is:

$$\max_{d_j} U_j^i = \left[1 - t_j\left(d_j\right)\right] y_j^i + \beta \ln G_j\left(d_j\right) \qquad \text{s.t. (6) and (7)} \tag{8}$$

Solving expression (8) and according to the median-voter theorem,[14] it follows:

$$d_j = \frac{\frac{\left(1-\gamma\right)}{1-\frac{\gamma}{J}}}{\left[\left(1-\gamma\right)+\frac{\gamma}{J}\right]} m_j \tag{9}$$

where m_j is the median-voter's income. Since $\frac{\frac{\left(1-\gamma\right)}{1-\frac{\gamma}{J}}}{\left[\left(1-\gamma\right)+\frac{\gamma}{J}\right]} \leq 1$, then $d_j \leq m_j$. This means that income of the elected policy-maker is not higher than that of the median-voter.[15] Hence, citizens choose a politician who is poorer than the median-voter because a higher level of public good would be provided by this way; this also allows exploiting economies of scale (γ / J). Thus, a "delegation effect" - producing "excessive levels" of public spending[16] - also occurs under decentralisation, and not only in a centralised framework as in Besley and Coate (2003).[17]

[14] Indeed, individual preferences are one-dimensional and single-peaked, thus the theorem holds.

[15] Only with no externalities ($\gamma \to 0$) or considering a polity with only one region ($J = 1$), the representative is the median-voter.

[16] More generally, these concepts sound quite familiar to the *Public Choice* approach according to which an "excess bias" in demanding public spending may occur when the median-voter's choice prevails with a majority rule.

[17] The strategic incentive to elect representatives with strong preferences for local public spending also arises in the analysis of Chari *et al.* (1997).

4. The centralised case

4.1. The choice of public spending and taxation

Policy determination under centralisation also has an election and a policy selection stage. We here analyse the second step, whereas the election process will be described in the next section. Under centralisation, the legislature determines public spending and the tax rate in each district. As in Besley and Coate (2003), a key issue is how to approach decision making in the legislature. In detail, we assume J collaborative local policy-makers - holding homogenous preferences for public goods and services - who cooperate in order to share the maximum level of their joint utilities. Even though there are gains from cooperation, this does not imply an obvious alternative for predicting legislative choices; there are indeed many pairs of public spending levels that are efficient from the viewpoint of the representatives.

By applying a uniform tax rate across regions (t), the total cost of providing public expenditure within the country is covered as follows:

$$t\sum_{j=1}^{J} Y_j = \alpha \sum_{j=1}^{J} G_j \tag{10}$$

The adoption of geographically discriminating income tax rates by cooperative decision-makers would be typically prevented by constitutional or other political obstacles, even though it could enhance a sort of horizontal equity (Oates 1972). Actually, this mechanism can better work in a "real" federal system where an active role of the central government is allowed. In our case, cooperation means to share the financing cost of public services provision within the national territory whereby some implicit transfers across regions may occur.

Likewise the decentralisation case, the maximisation problem of politicians who cooperate is given by the following:

$$\max_{\substack{G_j,t}} \sum_{j=1}^{J} U_j^d = W = \sum_{j=1}^{J} \left[(1-t) d_j + \beta \ln G_j \right] \quad \text{s.t. (3) and (10)} \tag{11}$$

Public spending and tax solutions are:

$$G_j = G_k = G = \left(\frac{Y/J}{\sum_{j=1}^{J} d_j \Big/ J} \frac{\beta}{1-\gamma} \right)^{\frac{1}{1-\gamma}} \tag{12}$$

$$t = \frac{J}{\sum_{j=1}^{J} d_j} \frac{\beta}{1-\gamma} \tag{13}$$

where $Y = \sum_{j=1}^{J} Y_j$ represents total national income. First, it is easy to note that the level of public goods and services provided under a centralised institutional setting is equal across regions ($G_j = G_k = G$). This is due to the fact that within a homogenous cultural context, differences in preferences for goods aimed at fulfilling personal rights are usually weak enough - null in our case - to justify a different provision of such goods in each region under a cooperative legislature. In this case, regional representatives find more convenience in assigning the same level of public services across regions instead of differentiating it.[18]

Moreover, the level of G negatively depends on average delegates' personal income ($\bar{d} = \sum_{j=1}^{J} d_j \Big/ J$) and positively on average regional income $\bar{Y} = \sum_{j=1}^{J} Y_j \Big/ J$, because the marginal utility of public services is decreasing with respect to the marginal utility of income. Likewise, the unique tax rate is also inversely related to average policy-makers' income. Finally, also in this case, both taxation and spending levels are positively correlated with the externality-scale index.

4.2. The strategic choice of the policy-makers

Under centralisation, citizens elect their own regional candidates by solving this maximisation problem:

$$\max_{d_j} U_j^i = \left[1 - t\left(\bar{d}\right)\right] y_j^i + \beta \ln G_j\left(\bar{d}\right) \quad \text{s.t. (12) and (13)} \tag{14}$$

Note that the main result of cooperation is to fix a standard level of services depending on the type of the legislators in all districts. Then, each individual would choose the policy-maker in all regions selecting an "average leader" (whose income is $\bar{d}$) who maximises his/her utility function. Yet, each individual can vote only for a local candidate without affecting the voting result of other jurisdictions. This may generate incentives for citizens in each region to delegate policy-making strategically (see also Persson and Tabellini 1992; Besley and Coate 2003)[19]. Characterising such incentives turns out to be quite complicated.

The FOC for solving equation (14) can be written as:[20]

$$\frac{\partial U_j^i}{\partial d_j} = \frac{\partial U_j^i}{\partial \bar{d}} \frac{\partial \bar{d}}{\partial d_j} = 0 \tag{15}$$

[18] Note that this result might not hold considering non-cooperative legislature and minimum winning coalitions linked thereto. Moreover, in order to keep the model tractable we assume that each local representative has the same weight in deciding the policy mix under centralisation. Hence, we consider the unweighted sum of the utility function of each local policy-maker in equation (11).

[19] "Strategic delegation: each district's median voter delegates policy-making to a representative with a different preference for public goods" (Besley and Coate 2003, p. 2624).

[20] The SOC implies $\frac{\partial^2 U_j^i}{\left(\partial d_j\right)^2} < 0$.

where $\frac{\partial \overline{d}}{\partial d_j}$ represents an example of strategic delegation according to which the election in one region actually depends on the expectations on elected candidates in other regions. In detail, equation (15) yields:

$$\frac{y_j^i}{\overline{d}} \sum_{k=1}^{J} \frac{\partial d_k}{\partial d_j} - \sum_{k=1}^{J} \frac{\partial d_k}{\partial d_j} = 0 \tag{16}$$

where $\sum_{k=1}^{J} \frac{\partial d_k}{\partial d_j} \left(= J \frac{\partial \overline{d}}{\partial d_j} \right)$ is the sum of the expected decision maker in region k when residents in region j change their voting. Solving (16) implies:

$$d_j = J y_j^i - \sum_{k \neq j}^{J} (d_k)^e \tag{17}$$

where $(d_k)^e$ is the decision-maker expected by citizens of region j to be elected in region k. Thus, each individual would choose himself as the "average policy-maker". As the median-voter theorem holds,[21] the election result is:

$$d_j = J m_j - \sum_{k \neq j}^{J} (d_k)^e \tag{18}$$

The majority rule in each district could lead to different solutions depending on the expected income level of the decision-makers in other regions. Equation (18) means that $\overline{d}$ should be equal to m_j; this condition is not feasible in all jurisdictions at the same time given median-voters' income heterogeneity (i.e., the median-voter in each region has different preferred candidates). Thus, different equilibria are feasible.

We can start from a situation where individuals vote for their local median-voter ($d_j = m_j$). We wonder whether this starting point is an equilibrium or not. It represents the equilibrium only if neither strategic vote nor myopic expectation is assumed. The latter means that region j expects that all other regions k always vote like region j itself: $(d_k)^e = m_j$. Thus, $\overline{d} = \sum_{j=1}^{J} m_j \Big/ J = \overline{m}$. Yet, in this case systematic errors occur and expectations are not fulfilled.

On the other hand, if we assume rational expectations and that each region adjusts its decision in order to increase the utility of its own median-voter, the equilibrium is then

[21] Actually, the median-voter holds if $\sum_{k=1}^{J} \frac{\partial d_k}{\partial d_j} > 0$ that is likely to be true.

different from the starting point. In detail, regions with median-voter's income lower than their mean ($m_j < \overline{m}$) have an incentive to delegate policy-making to a representative poorer than its median-voter in order to reduce politicians' average income. On the contrary, regions with median-voter's income higher than their mean ($m_j > \overline{m}$) have an incentive to delegate policy-making to a representative richer than its median-voter in order to increase politicians' average income. Hence, let us order, to simplify the exposition and keep the model tractable, that the median-voter of region 1 is richer than one of region 2 and so on: $m_1 > m_2 > ... > m_J$,[22] so it can be demonstrated that $\overline{d} = m_1$.

Income heterogeneity creates an additional conflict over the level of public spending. If each region elects a representative of the median type, the common level of public goods is higher for rich regions and lower for those which are poor. Hence, the former have an incentive to vote for a candidate richer than the median-voter; for the latter, the opposite incentive prevails. In short, "such strategic delegation can be individually rational, but collectively self-defeating [...] as even when regions share an interest in each other's public goods, the conflict of interest over the level of public spending means that centralisation can yield policy outcomes that are far from the surplus maximising ideal" (Besley and Coate 2003, p. 2626).

We may generalise these results assuming that average income of politicians corresponds to income of the median-voter of a generic region (*R*), thus $\overline{d} = m_R$. Under this condition, we can have myopic wrong expectations if $m_R = \sum_{j=1}^{J} m_j / J$, so $\overline{d} = m_R = \overline{m}$; correct expectations when *R=1*, so $\overline{d} = m_R = m_1$.

5. Comparative statics

In order to choose the institutional system, we assume that income within each region is Pareto-distributed.[23] In this case, there is a stable relationship between average per capita income (y_j) and median income: $m_j = y_j Z_j$, where Z_j is approximately equal to the complement of the Gini index ($Z_j \approx 1 - Gini_j$). Thus, Z_j represents a measure of income "equality" *within* region *j*: lower values of Z_j indicates high degree of inequality within region

[22] We assume that the average regional endowments and the benefit function are such that this relationship is always fulfilled.

[23] The Pareto distribution was originally developed to describe the distribution of income, where the share *p* of a population has the (*1-p*) share of the income (Pareto 1896-97). After Pareto, several efforts to confirm or reject this law were done by scholars. In particular, for low-income individuals, the Pareto distribution does not seem to fit well real data, and other distributions, such as log-normal (Aitchison and Brown 1957), are used. On the contrary, some authors have tried to generalise the Pareto distribution (Singh and Maddala 1976; Clementi and Gallegati 2005) in order to describe the lower part of the income distribution. Moreover, it can be demonstrated that income is asymptotically distributed as a generalised Pareto (Champernowne 1953). More recently, power laws or Levy's distributions (generalised Pareto distributions) seem to fit quite correctly the data on wealth distribution because of the stochastic multiplicative nature of the accumulation process (Reed 2001; Levy 2004). In our model, we assume the Pareto distribution as it allows to represent an asymmetric distribution like that of income and to interpret the shape parameter of the distribution as a function of the Gini index. In addition, our results do not change using another asymmetric distribution such as, for example, the lognormal one.

j; higher values of Z_j mean the opposite. Moreover, let us assume that n_j, Z_j and y_j are mutually independent, thus:

- $\overline{Y} = \sum_{j=1}^{J} Y_j \Big/ J = \overline{y}\overline{n}$, where $\overline{y} = \sum_{j=1}^{J} y_j \Big/ J$ and $\overline{n} = \sum_{j=1}^{J} n_j \Big/ J$;
- $\overline{m} = \sum_{j=1}^{J} m_j \Big/ J = \overline{y}\overline{Z}$, where $\overline{Z} = \sum_{j=1}^{J} Z_j \Big/ J$.

Note that each region compares decentralised solution with a centralised one, which is calculated with respect to a "benchmark" region (R). For simplicity, we can then rewrite $m_R = \overline{y} Z_R^*$, where $Z_R^* = \left(\frac{y_R}{\overline{y}} Z_R \right) \geq \overline{Z}$. Thus, if we have myopic expectations, the benchmark corresponds to this condition, $\overline{d} = m_R = \overline{m} = \overline{y}\overline{Z}$; if we have rational expectations, the benchmark is represented by the richest region ($R = 1$), $\overline{d} = m_1 = y_1 Z_1 = \overline{y} Z_1^*$. After some algebra, we can sum up previous results as follows:

Table 1 - *Solutions*

	Decentralised case	**Centralised case**
Public goods	$G_j^* = \frac{n_j}{Z_j}\left(\frac{\beta}{1-\gamma}\right)^{\frac{1}{1-\gamma}}\left(1-\gamma+\frac{\gamma}{J}\right)^{\frac{1}{1-\gamma}}\left(\prod_{k=1}^{J}\frac{n_k}{Z_k}\right)^{\frac{\gamma}{J(1-\gamma)}}$ (19)	$G^* = \left(\frac{\overline{n}}{Z_R^*}\frac{\beta}{1-\gamma}\right)^{\frac{1}{1-\gamma}}$ (21)
Taxation	$t_j^* = \left(1-\gamma+\frac{\gamma}{J}\right)\left(\frac{1}{Z_j y_j}\right)\frac{\beta}{1-\gamma}$ (20)	$t^* = \left(\frac{1}{Z_R^* \overline{y}}\right)\frac{\beta}{1-\gamma}$ (22)
Utility	$U_j^{DEC} = (1-t_j^*) y_j^i + \beta \ln G_j^*$	$U_j^{CEN} = (1-t^*) y_j^i + \beta \ln G^*$

The generic individual with income y_j^i living in region *j* will prefer decentralisation if:

$$U_j^{DEC} - U_j^{CEN} = (t^* - t_j^*) y_j^i + \beta (\ln G_j^* - \ln G^*) > 0 \qquad (23)$$

It is easy to note that the voting result depends on the cost of services that characterises each system (taxation) and the supply of public goods and services. Moreover, the richer is the individual, the higher is the weight assigned to the tax rate and the lower is that of public spending. In this vein, we consider the two components separately.

5.1. The role of taxation

Comparing tax rates under decentralisation and centralisation means to solve $t_j^* < t^*$, referring, respectively, to equations (20) and (22) of table 1. It yields:

$$\left(1-\gamma+\frac{\gamma}{J}\right) < \frac{Z_j y_j}{Z_R^* \overline{y}} = \frac{m_j}{m_R} \qquad (24)$$

Equation (24) implies that individuals are likely to prefer a decentralised institutional setting - as they will pay less - whether: income distribution *within* region *j* is less unequal that one in the benchmark region R ($Z_j > Z_R^*$); the level of per capita income of region *j* is higher than average per capita income ($y_j > \overline{y}$). In other words, citizens belonging to more homogenous jurisdictions and richer than the average would stay better under decentralisation as they will be subject to a lower taxation.

The latter condition is driven by the "tax base effect" according to which the wealthier community will be able, other things equal, to meet its revenue requirements with lower tax rates. As a result, for a specified amount of public services, an individual in a wealthier region will have a smaller tax bill than his/her equal in a poorer locality. This is also consistent with findings of Bolton and Roland (1997) whereby there is, in their case, a tax benefit from separation for richer regions as they no longer provide a tax transfer to poorer ones; on the contrary, there is an additional cost of separation for poorer regions due to the smaller tax base following separation.

As for *within* income inequality, higher local income inequality makes decentralised solution less suitable considering the tax side. The intuition is the following. Individuals living in regions characterised by a more equal income distribution find more convenient remain autonomous and delegate policy-making to their own representatives, who decide taxes independently, instead of selecting a more cooperative institutional setting where different regional income distributions - probably more unequal than their own - will be considered and differently affect - i.e. increasing - the taxation level. This result also appears to be in line with the "political factor" developed by Bolton and Roland (1997). Indeed, the presence of such political factor - which arises, in their model, from differences in income distribution across regions, so reflecting the difference in preferences over fiscal policy between the median-voter in a specific region and the median-voter in the unified nation - "explains why a region with very low income inequality may want to break away from a nation with high income inequality and high tax rates in order to impose lower tax rates" (p. 1059).

On the contrary, in more unequal local communities citizens may get a greater advantage by joining with other districts in order to smooth their income distribution, share taxation and, thus meet lower tax burden.

In addition, this finding is more likely when γ increases, that is the extent of spillovers grows up. In general, decentralisation is more likely to occur when γ grows up since t increases more quickly than t_j with γ.[24]

5.2. The role of public spending

Concerning the supply of public goods, we compare the following $G_j^* > G^*$, respectively from equations (19) and (21). By taking the logarithmic form and solving it, we have:

$$\frac{1-\gamma}{\gamma}\left(\ln\frac{n_j}{\overline{n}} - \ln\frac{Z_j}{Z_R^*}\right) + \frac{1}{\gamma}\ln\left(1-\gamma+\frac{\gamma}{J}\right) > Hn - Hz \qquad (25)$$

[24] This is due to the fact that, under centralisation, internalisation of positive externalities may occur, especially when spillovers are high. Hence, the amount of public goods provided in this case is likely to be higher and also the production cost linked thereto. As a consequence, centralised taxation required to finance public spending with high spillovers is higher than decentralised one, *ceteris paribus*.

where $Hn = \ln\left[\bar{n} \Big/ \left(\prod_{k=1}^{J} n_k\right)^{\frac{1}{J}}\right]$ and $Hz = \ln\left[Z_R^* \Big/ \left(\prod_{k=1}^{J} Z_k\right)^{\frac{1}{J}}\right]$ are two indexes of heterogeneity, respectively of the population size (Hn) and of income distribution (Hz).[25] Generally speaking, Hn and Hz represent two structural factors of the economy, which are independent of the relative position of region *j*.

Hence, expression (25) suggests under which conditions the generic individual would vote for decentralisation considering the level of public spending provided. In detail, this happens whether he/she belongs to region *j* which is: larger than the average ($n_j > \bar{n}$); more unequal than the benchmark one ($Z_j < Z_R^*$).

In general, the size effect ($n_j > \bar{n}$) seems to better support a decentralised system in line with the fact that "larger groups will provide smaller amounts of a public good" is not a universal result neither theoretically (see, for instance, Chamberlin 1974), nor empirically (Isaac and Walker 1988). More recently, Fiorillo and Sacchi (2011) also find that larger jurisdictions would prefer decentralisation, as these regions should pay implicit transfers (i.e., cross subsidisation) to smaller ones when taxation is centralised. Thus, large municipalities can self-finance under decentralisation, especially without any external spillovers to exploit.

Nevertheless, equation (25) starts to be false when variability in size (Hn) increases. In other words, centralisation is preferred when regions are very different in size. Intuitively, high variability in size is correlated with high variability in revenues, thus public goods provision would be very uneven under decentralisation. As the marginal utility of public goods is decreasing, a centralised (uniform) provision allows, on average, a higher level of services than a decentralised and uneven one can do.

In reference to income distribution, we find an opposite result than the previous one, when the tax side has been considered. Indeed, citizens living in less homogenous jurisdictions ($Z_j < Z_R^*$) would prefer decentralisation as they can obtain more public goods and services than those provided under a centralised setting, *ceteris paribus*. This result appears, to some extent, not quite standard as it indicates that increasing (income) inequality *within* region contributes to increase welfare gains from decentralised public goods provision. Further developments of the Oates's *Decentralisation Theorem* (1972),[26] where preferences heterogeneity is also *within* a local community - and not only *between* local communities - show that the centralised solution causes lower welfare losses on efficiency grounds.

In our case, higher income inequality at the local level is likely to foster a sort of "expenditure decentralisation" which means that a higher amount of public spending can be available under a decentralised policy-making process. Thus, we may affirm that, focusing on the expenditure side, inequality *within* region is likely to favour decentralisation. The intuition of this finding can be the following. In more unequal regions, the median-voter probably has a lower income than the median-voter of the benchmark region, i.e. under centralisation. Being poorer, he/she needs a higher amount of public goods which can be obtained only under decentralisation. Indeed, under centralisation a uniform supply of public services occurs and it derives from cooperation among local decision-makers, who take into account, to some extent, different regional income distributions. On the contrary, the median-voter of less unequal regions is likely to be richer than the "benchmark" median-voter and would need a lower amount of public goods, so preferring centralisation.

Hence, recalling the main findings of Bolton and Roland (1997, p. 1059), "a region with high income inequality may want to separate in order to impose more redistribution than in the unified nation"; it may want to remain autonomous, in our case, in order to obtain more

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[25] Since the following holds: $Z_R^* \geq \bar{Z} \geq \left(\prod_{k=1}^{J} Z_k\right)^{\frac{1}{J}}$.

[26] Some school examples are included in Liberati (1999); Brosio and Piperno (2009).

redistributive spending. Furthermore, by interpreting public spending as a measure of government size, we may draw similar conclusions to those of Meltzer and Richard (1981), whereby more inequality leads to a larger public sector.[27]

Considering structural parameters, condition (25) is more likely to be true when variability in income distribution across regions increases (Hz). This means that inequality *between* regions can also enhance decentralisation; on the contrary, in a centralised system, *between* inequality increases cross subsidisation effect, thus gains are less, on average, than losses, because of the decreasing marginal utility of public goods. Again, Bolton and Roland (1997) found a similar result whereby the overall effect of an increase in the cross-regional differences in income inequality is to make separation more likely. In addition, our finding is to some extent consistent with Oates's *Decentralisation Theorem* (1972) according to which some kind of heterogeneity - in preferences in that case; in income in our model - can enhance decentralisation as the more efficient solution. Hence, both *between* and *within* income inequalities are likely to increase the convenience of decentralisation based on expenditure reasons.

Finally, in order to consider the effect of externalities let us take the expected value of equation (25) that yields:

$$\ln\left(1-\gamma+\frac{\gamma}{J}\right) > Hn - Hz \tag{25.a}$$

According to this "new" condition, decentralisation is likely to prevail when γ is low. Hence, the centralised provision of public goods is, in aggregate, higher than the decentralised one when externalities are high. This result is quite standard as centralisation is better to guarantee gains from the internalisation process. However, by comparing equation (25) with (25.a), it is worth to note that this finding does not hold for all regions. In particular, small regions ($n_j < \bar{n}$) and those where *within* income inequality is low ($Z_j > Z_R{}^*$) could supply a higher amount of public services under a decentralised system with high (and not low) externalities.

5.3. The individual voting for the institutional system

In order to draw some conclusion on which system is more convenient from the individual utility viewpoint, we have to solve equation (23) after making some substitutions. It yields:

$$\begin{aligned} U_j^{DEC} - U_j^{CEN} = {} & \frac{\beta}{1-\gamma}\left[\left(\frac{1}{Z_R{}^*\bar{y}}\right)-\left(1-\gamma+\frac{\gamma}{J}\right)\left(\frac{1}{Z_j y_j}\right)\right] y_j^i + \\ & + \frac{\beta}{1-\gamma}\ln\left[\left(\frac{n_j}{\bar{n}}\frac{Z_R{}^*}{Z_j}\right)^{1-\gamma}\left(1-\gamma+\frac{\gamma}{J}\right)\left(\frac{\prod_{k=1}^{J} n_k^{\frac{1}{J}}}{\bar{n}}\right)^{\gamma}\left(\frac{Z_R{}^*}{\prod_{k=1}^{J} Z_k^{\frac{1}{J}}}\right)^{\gamma}\right] \end{aligned} \tag{26}$$

[27] In detail, they studied how income disparity *within* a one-jurisdiction polity affects government size. Yet, this result is not confirmed by Giuranno (2009), who extends Meltzer and Richard's analysis to a two-jurisdiction polity with a common public good and tax policy stipulated on the basis of bargaining among the jurisdictional decision-makers. Indeed, by introducing regional representatives' negotiations in the legislature, he shows that greater *interregional* income disparity leads to a smaller public sector, reducing redistributive public spending.

when $U_j^{DEC} - U_j^{CEN} > 0$, the individual with income y_j^i votes for decentralisation. The result will depend on the impact of relevant variables on taxation and public goods as observed before. This means that it is more likely to vote for decentralisation if: a) per capita income of region *j* is higher than the average; b) the size of region *j* is higher than the average; c) *between* variability of income distribution across regions is high; d) variability in size is low. These effects are unambiguous since they specifically affect either tax or public spending side or both items in the same direction.

On the other hand, the impact of *within* income inequality is not so clear.[28] Indeed, from previous comparative statics, it emerges that the level of income concentration in region *j* compared to the benchmark one has an opposite effect on taxation and public spending, so differently affecting the individual voting for the institutional system. A lower concentration reduces the cost (taxation) of decentralising, yet it also implies a lower provision of public goods and services under decentralisation. In addition, as already stated, rich people in all regions are likely to mainly take into account the cost issue during the voting process; while poor people basically consider the different impact of public goods provision on their utility functions.

Let us study equation (26) when Z_j changes. It is easy to show that $\lim_{Z_j \to 0} U_j^{DEC} - U_j^{CEN} = +\infty$; moreover, equation (26) has a maximum for $\widetilde{Z}_j = \frac{y_j^i}{y_j}$.[29]

In detail, when $y_j^i > y_j$, which means the individual i is richer than the average in region j, $U_j^{DEC} - U_j^{CEN}$ always increases with the level of income equality (Z_j). Thus, it may exists a threshold $Z_{\min}$ such that for high degree of local income concentration ($Z_j < Z_{\min}$), the rich individual votes for centralisation; otherwise ($Z_j > Z_{\min}$) for decentralisation (figure 1, case A). Note that if this value does not exist,[30] he/she votes for centralisation (figure 1, case B).

Then, rich people could prefer a standard level of public goods and services only in the case of higher *within* income inequality. This is mainly due to the fact that they pay less under a centralised system than under a decentralised one. Intuitively, the rich belonging to a more unequal region know that through centralisation they can reduce their costs of redistribution because they have to consider an "overall" income distribution that is flatter than their own.

When considering an individual poorer than the average ($y_j^i < y_j$), they may exist up to two thresholds (figure 2, case B): $Z_{\min}$ and $Z_{\max}$.[31] If no thresholds exist (figure 2, case C), the centralised solution is chosen. If only one threshold exists (figure 2, case A), that is $Z_{\min}$ such that for high degree of *within* income concentration $Z_j < Z_{\min}$, poor individuals vote for centralisation; otherwise ($Z_j > Z_{\min}$) for decentralisation. These results are determined by the role of taxation, as for the rich.

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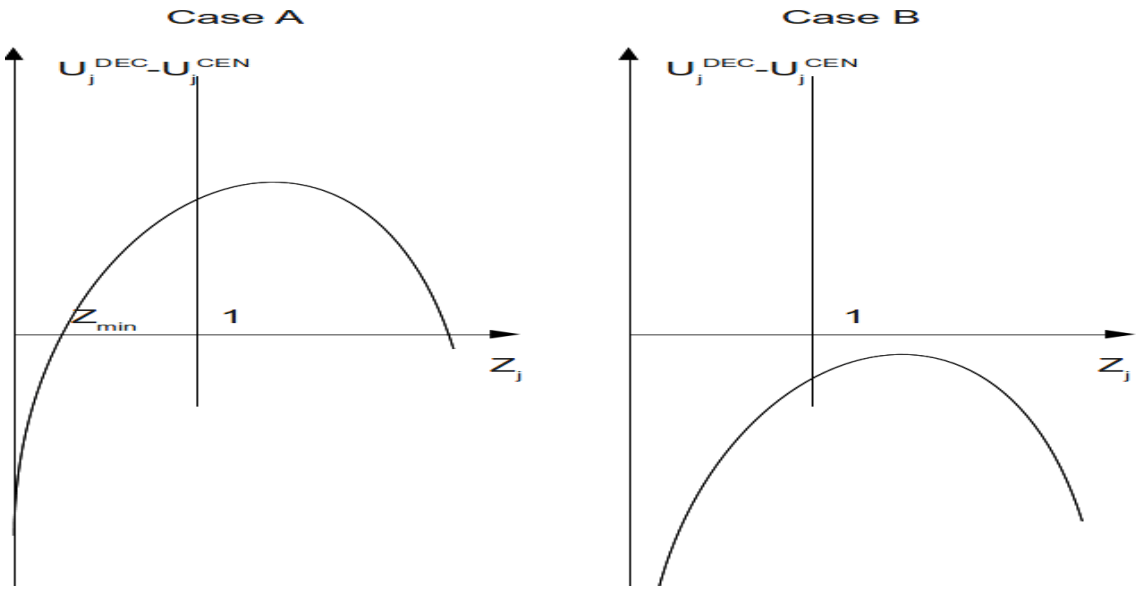
[28] The impact of externalities is also not clear *a priori* considering the difference between the utility functions under both regimes. Moreover, we have already noted that different findings also emerge for small and large regions focusing only on the expenditure side.

[29] This maximum is feasible only if $\widetilde{Z}_j < 1$.

[30] The existence of the threshold depends on the interactions among other variables.

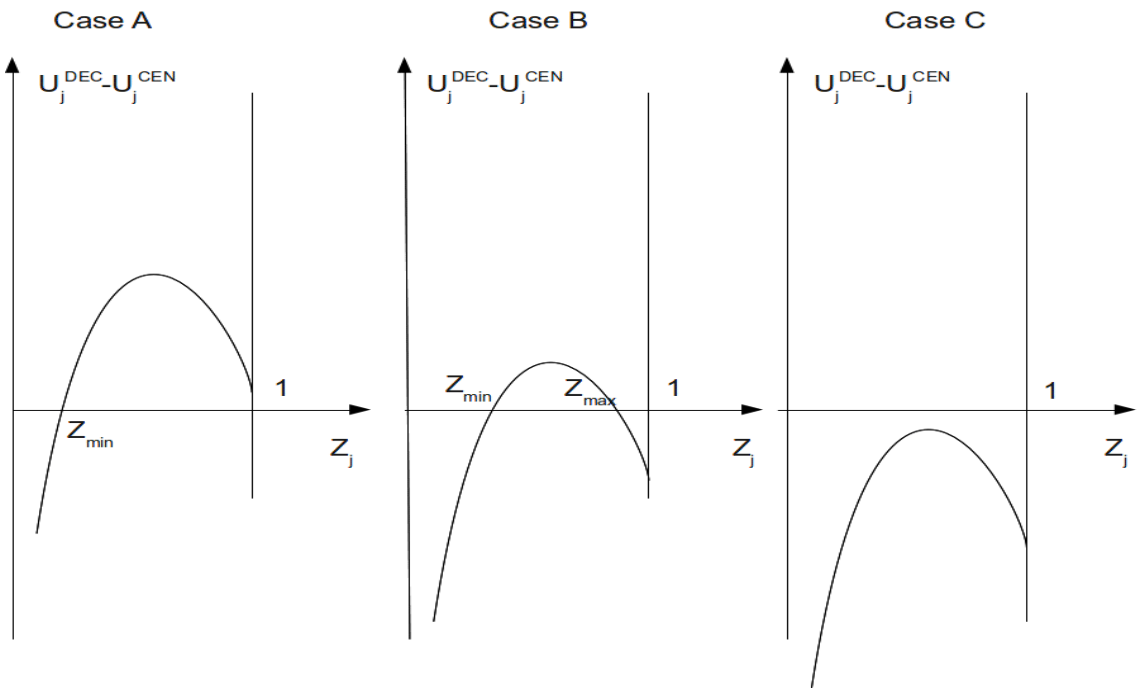
[31] In detail, $Z_{\min} < \frac{y_j^i}{y_j} < Z_{\max}$. Since $\frac{y_j^i}{y_j} < 1$.

Figure 1 - *The institutional choice of the rich individual*



However, considering the poor, another threshold can emerge (Z_{max}). When $Z_j > Z_{max}$, poor people living in jurisdiction j do not choose decentralisation; this is due to the higher centralised provision of public goods when regional income concentration is low (figure 2, case B). On the other hand, for intermediate values of local income inequality ($Z_{min} < Z_j < Z_{max}$), poor individuals would prefer decentralisation. Finally, when $Z_j < Z_{min}$, they select a centralised system because of the tax argument.

Figure 2 - *The institutional choice of the poor individual*



Hence, comparing to the rich, poor people also vote for a standard level of public services - centralisation - when the degree of income disparity *within* their region is low. To sum up, no a unique solution emerges for both the rich and the poor, but it basically depends on the degree of income concentration *within* their region. More precisely, it seems that they disagree for lower *within* inequality as the poor would prefer centralisation while the rich would vote for decentralisation. However, when income distribution *within* region worsens (e.g., there more poor and/or with less income), rich and poor individuals are likely to agree, both voting for centralisation. Thus, we may infer that the pressure for differentiated standard levels of public services weakens, in favour of more cooperation and uniform provision of such services when *within* income inequality is very high.

6. Concluding remarks

This paper provides a positive analysis by comparing the convenience of a common standard level of services set under a centralised institutional system *versus* different provision of public goods - which means the absence of the standard level - when decisions are decentralised. In both cases, a political economy approach is adopted (Persson and Tabellini 2000; Besley and Coate 2003; Giuranno 2009) and income heterogeneity across individuals is assumed. A different source of disparity *across* regions such as their income - instead of their preferences (Oates 1972) or their population size (Fiorillo and Sacchi 2011) - allows challenging the traditional findings according to which greater heterogeneity should basically enhance more decentralisation. Moreover, unlike the traditional literature, the effect of income disparity *within* regions is also considered into the analysis.

In order to choose the institutional system, individuals take into account income inequality *between* and *within* regions as both can (differently) affect the government decision-making process, including the opportunity to fix a standard level of services. In turn, preferences heterogeneity is not actually required to make a case for decentralisation (see also Seabright 1996; Tommasi and Weinschelbaum 2007), especially in the case of public goods with some "merit content" as also argued by Hatfield and Miquel (2008).

By combining the theory of fiscal federalism with public goods aimed at fulfilling minimum individual rights, we try to capture both effects of intraregional and interregional income inequality extending, to some extent, the Giuranno's work (2009) where only the latter effect is treated,[32] and the Meltzer and Richard's model (1981) where only the former issue is considered.

The main findings of this paper suggest that higher local income inequality - *within* inequality - makes the decentralised solution less suitable considering the tax side. Indeed, in more unequal local communities, citizens may get a greater utility by joining with those of other regions in order to smooth their income distribution, share taxation and, thus meet lower tax obligations. On the other hand, an opposite result emerges from the expenditure side. Indeed, higher income inequality *within* jurisdiction is likely to favour a higher amount of public services provided under a decentralised policy-making process, enhancing a sort of *expenditure decentralisation.*

Hence, in order to draw some conclusion on which system is more convenient from the individual utility viewpoint, we have analysed these effects together for different individuals (i.e., rich and poor people) living within the same region. Individually, the rich and the poor would not always prefer the common standard level of services. In detail, the rich would prefer a standard level of public goods (i.e. centralisation) only in the case of higher *within* income disparity, driven by tax motivations. On the contrary, poor people vote for a standard level of

[32] As argued by Giuranno (2009, p. 714): "There are, however, a number of ways in which intra- and interregional income differences may vary and affect public spending. We leave this analysis for further research."

public services also when the degree of income disparity *within* their region is low, stimulated by a higher spending provision under centralisation. As expected, rich and poor individuals seem to prefer opposite regimes but only when income distribution is quite homogenous in their region, whereas both are likely to vote for a common standard provision of public services when *within* income inequality increases. To some extent, we may affirm that a more cooperative solution seems to prevail when "domestic" economic conditions worsen a lot.

The effect of interregional income inequality is, instead, much clearer as both individuals would prefer decentralisation when inequality *between* regions is high. This result sounds familiar with the traditional argument of the fiscal federalism (i.e. Oates 1972), even assuming homogeneity of preferences. In addition, this finding seems to fit well with the existence of institutional conflicts observed at the empirical level in presence of different local resources (e.g. in Italy and Belgium), according to which rich regions would prefer to redistribute less, while poor ones would get more through implicit transfers mechanisms (see also Bolton and Roland 1997; Sacchi 2008).

Finally, the model can be extended to allow representatives form a minimum winning coalition to choose policy in the legislature - non-cooperative legislature as in Besley and Coate (2003) - instead of assuming only the cooperative one. Moreover, an empirical investigation on the main findings of the model could be the issue for further research.

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