WOULD LESS SOLIDARITY JUSTIFY PRESENT CALLS FOR DEVOLUTION?

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JEL Classification: H7; H4

Keywords: devolution; equalization grant; regional income distribution
Would less solidarity justify present calls for devolution?

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Abstract

In this study, we argue that the rules set by a central government to allocate interregional equalization grants may induce richer regions to ask for devolution, even when centralized provision is more efficient. We model a local public good with spillovers in a framework in which devolution is socially inefficient. Nevertheless, we show that the decentralized solution may be preferred by the richer regions if it implies a reduction in solidarity. We define a threshold for regional income disparity above which claims for more devolution may be driven by a reduction in solidarity. Finally, the relative strength of this effect is computed for a sample of countries.

Keywords: devolution; equalization grant; regional income distribution

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1 Introduction

Decentralization in decision making is a very controversial issue (Weisner, 2003; Oates, 2008; Weingast, 2009). In Europe, calls for devolution within countries (Thießen, 2003) coexist with a drift toward centralization of some relevant functions, such as fiscal policies (Tanzi, 2008; Vaubel, 2009; Tanzi, 2009). In developing countries, often decentralization is prioritised highly in political agendas (Weisner, 2003), even though its effects on economic growth and regional income disparities remain a controversial issue (Barrios and Strobl, 2009; Sacchi and Salotti, 2013; Sorens, 2014).

The mainstream economic literature suggests that decentralization may be justified by differences in local preferences and asymmetry of information (Levaggi and Smith 1994; Levaggi and Levaggi 2011; Akai and Mikami 2006; Oates 2005), while the political economic literature (Oates, 2005, Inman and Rubinfield, 1997, Hillman, 2009, and Besley and Coate, 2003) shows that decentralized decisions are optimal in the presence of coalitions and bargaining in the decision making process.

In this study, we suggest the presence of another driving force and show how the choices made by a central government about interregional income distribution may induce richer regions to ask for devolution, even when this implies a reduction in total welfare.

We introduce an equalization grant within the framework proposed by Besley and Coate (2003) and compare welfare for two scenarios: (i) centralization, in which the provision is granted by the central government, and (ii) devolution, in which each region autonomously sets its expenditure level. As
in Besley and Coate’s model, we assume complete and symmetric information and no comparative advantage in local provision. As is well known, in such a framework, devolution is always suboptimal for the whole community (and, accordingly, expenditure should be decided by the upper government tier). However, wealthier regions may experience reductions in net regional fiscal flows (Ambrosanio et al., 2010), and they may lobby for the devolution of this function, even if, at social levels, their benefits are compensated for by the losses suffered by the poorer regions (Ferrario and Zanardi, 2011). This is especially true when income is distributed unevenly at regional level. In Section 2, we present our model and define a threshold in terms of regional income disparity above which claims for more devolution may be driven by a reduction in solidarity.

2 The model

We examine devolution in a two-region \((i \in \{A, B\})\) economy in which a local public good \((g_i)\) with spillovers is produced. The total cost for producing \(g_i\) is \(v_i g_i\) (i.e., there are no fixed costs). Each region is endowed with an income \(Y_i\) and \(A\) is wealthier and more efficient than \(B\), that is, \(Y_A > Y_B\) and \(v_A < v_B\). Preferences for the local public good are assumed to be homogeneous within each local authority. The total population is standardised to one and both regions have the same size, that is, each has a population equal to \(\frac{1}{2}\). If a linear tax \(\tau_i\) is levied on local income, the welfare function for each region
can be written as

\[ W_i = Y_i (1 - \tau_i) + \lambda_i ((1 - \alpha_i) \ln g_i + \alpha_i \ln g_j), \ j \neq i \in \{A, B\}, \]  

(1)

where \( \lambda_i \) is a public good preference parameter. As in Besley and Coate (2003), the value of \( \alpha_i \in [0, \frac{1}{2}] \) determines the level of spillovers: for \( \alpha_i = 0 \), the good is a local public good; for \( \alpha_i = \frac{1}{2} \), it is a public good; and for \( 0 < \alpha_i < \frac{1}{2} \), it is a local public good with spillovers.

Centralized provision is financed through a uniform tax whose rate \( \bar{\tau} = \tau_A = \tau_B \) is such that the budget constraint is satisfied, as follows.

\[ \bar{\tau} (Y_A + Y_B) = g_A v_A + g_B v_B, \]  

(2)

while decentralized provision has two sources of finance: a local tax \( \tau_i \) and an equalization grant \( G_i \) distributed in a lump sum, as suggested by Dahlby and Wilson (1994) and Smart (1998). Thus, each region has the following budget constraint

\[ \tau_i Y_i + G_i = v_i g_i \iff \tau_i = \frac{v_i g_i - G_i}{Y_i}. \]  

(3)

The grant \( G_i \) may be a combination of two kinds of grant:

- **Expenditure based:**

\[ G_{iEB} = \frac{1}{2} \frac{\tau_A Y_A + \tau_B Y_B}{Y_A + Y_B} (Y_j - Y_i), \]  

\[ \tau_i^{\text{m}} \]
- Resource based:

\[ G_{i}^{RB} = a \bar{\tau} \frac{1}{2} (Y_j - Y_i), \]

where \( \bar{\tau} \) (as in (2)) is the tax rate at which the central government decides to equalize resources; usually, this is correlated with a standard level of services (Blöchliger and Charbit, 2008), and \( a \) is the degree of equalization that the government wishes to pursue. We assume that in a centralized state, \( a = 1 \), while in a decentralized structure, its value may fall below 1. In both cases, the grant of one region equals the opposite of the other region’s grant (i.e., \( G_i = -G_j \)).

Thus, we can write

\[ G_i = (1 - \beta) G_{i}^{EB} + \beta G_{i}^{RB}, \]

where \( \beta \in \{0, 1\} \): with \( \beta = 0 \), the grant is expenditure based; for \( \beta = 1 \), it is resource based. Even if actual systems use a combination of both grants (Blöchliger and Charbit, 2008), we consider only pure forms. In Section 3, we examine two different settings: (i) centralization: the maximization of (1) by a centralized decision maker, which takes into account the welfare of both regions and (ii) devolution: the maximization of (1) is performed independently by each region.

### 3 Centralization versus devolution

Centralization means that the central authority sets the optimal provision of the public good for both regions by maximising the sum of their welfare. Thus, the problem can be written as
\[
\begin{align*}
\max_{g_A,g_B} W^C &= Y_A (1 - \bar{\tau}) + \lambda_A ((1 - \alpha_A) \ln g_A + \alpha_A \ln g_B) \\
&+ Y_B (1 - \bar{\tau}) + \lambda_B ((1 - \alpha_B) \ln g_B + \alpha_B \ln g_A),
\end{align*}
\]

subject to

\[
\bar{\tau} = \frac{g_A v_A + g_B v_B}{Y_A + Y_B}.
\]

Devolution means that each region maximizes its own welfare; the problem of region \(i\) can be written as

\[
\begin{align*}
\max_{g_i} W^D_i &= Y_i (1 - \tau_i) + \lambda_i ((1 - \alpha_i) \ln g_i + \alpha_i \ln g_j),
\end{align*}
\]

under the constraint

\[
\tau_i = \frac{g_i v_i - G_i}{Y_i}.
\]

For decentralization, we assume the presence of fiscal illusion, that is, local authorities do not perceive the effects that their expenditure decisions have on the equalization grant. The solutions are summarized in Table 1 and their derivations are presented in Appendix A.

As expected, the quantity of public good produced in a centralized model is greater than that produced in a decentralized one. This is because the centralized solution takes into account the spillover effects that are ignored in devolution. However, the welfare of the richer region may be higher in
<table>
<thead>
<tr>
<th>Centralization</th>
<th>Devolution</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Public good</strong></td>
<td>$g_i^* = \lambda(1-\alpha_i)/v_i$</td>
</tr>
<tr>
<td>Grant</td>
<td>$G_A = -(1-\beta)(\lambda A(1-\alpha_A) + \lambda B(1-\alpha_B))(Y_A - Y_B)$</td>
</tr>
<tr>
<td>Tax rate</td>
<td>$\tau_A = \lambda A(1-\alpha_A)/\lambda A(1-\alpha_A) + \lambda B(1-\alpha_B)$ + $\beta a \bar{\tau}$</td>
</tr>
<tr>
<td></td>
<td>$\tau_B = \lambda B(1-\alpha_B)/\lambda A(1-\alpha_A) + \lambda B(1-\alpha_B)$ + $\beta a \bar{\tau}$</td>
</tr>
</tbody>
</table>

Table 1: Centralization versus devolution
decentralization if the fiscal flow from $A$ to $B$ is sufficiently reduced. If the grant is expenditure based, the decentralized solution implies a reduction in expenditure, which, in turn, causes a reduction in the equalization grant. As a result, the wealthier region has more income to buy private goods; hence, the welfare loss deriving from suboptimal provision of the public good has to be weighted against the increase in disposable income. A similar process may result from the choice of the value of $a$, that is, the degree of equalization that the central government wants to pursue. The lower $a$ is, the lower the fiscal flow from $A$ to $B$ is, and the higher the incentive for Region $A$ is to ask for decentralization.

We now examine the case in which resources are equalized using an expenditure-based grant. The presence of the grant does not allow us to conclude that centralization is a Pareto-superior solution to devolution. In fact, the income distribution between regions should be sufficiently uneven for the wealthier region to be better off with devolution. In Appendix B, we show that this occurs when the Gini coefficient is sufficiently high, that is,

$$\frac{Y_A}{Y_A + Y_B} - \frac{1}{2} > Z^{EB} (\lambda_A, \lambda_B, \alpha_A, \alpha_B), \quad (8)$$

where the threshold $Z^{EB}$ can be written as
\[
Z^{EB}(\lambda_A, \lambda_B, \alpha_A, \alpha_B) \\
\equiv \lambda_A \left(1 - \alpha_A\right) \ln \frac{\lambda_A(1-\alpha_A) + \lambda_B\alpha_B}{\lambda_A(1-\alpha_A)} + \alpha_A \ln \frac{\lambda_B(1-\alpha_B) + \lambda_A\alpha_A}{\lambda_B(1-\alpha_B)} \\
+ \frac{1}{2} \frac{\lambda_A(1-\alpha_A) - \lambda_B(1-\alpha_B)}{\lambda_A\alpha_A + \lambda_B\alpha_B} - \frac{1}{2}.
\]

The right-hand side of Equation (8) depends on both the preferences for the public good ($\lambda_i$) and the spillovers ($\alpha_i$). When the preferences for local public goods are the same in both regions (i.e., $\lambda_A = \lambda_B = \lambda$), the interpretation is straightforward: $\lambda$ disappears. In this case, the threshold is increasing in $\alpha_A$ and decreasing in $\alpha_B$, as one might expect. It is interesting to note that if the spillovers are symmetric (i.e., $\alpha_A = \alpha_B = \alpha$), Equation (8) can be written as

\[
\frac{Y_A}{Y_A + Y_B} - \frac{1}{2} \cdot \frac{\text{GINI}}{\lambda_A\alpha_A + \lambda_B\alpha_B} > -\frac{\ln(1-\alpha)}{2\alpha} - \frac{1}{2} \equiv Z^{EB}(\alpha),
\]

and the simplified threshold can be plotted as in Figure 1.

In this case, the threshold $Z^{EB}$ is 0.193 ($\alpha = 0.5$: a public good in the definition of Besley and Coate) and 0 ($\alpha = 0$: a local public good). This threshold may be used for an evaluation of the claims for devolution: the higher $\text{GINI}$ is, the stronger is the demand for devolution from rich local authorities, which also implies a reduction in solidarity.

If the grant is resource based and its amount does not depend on the
Figure 1: The spillover parameter $\alpha$ is on the horizontal axis, while the threshold function $Z^{EB}(\alpha) = -\frac{\ln (1-\alpha)}{2\alpha} - \frac{1}{2}$ is measured on the vertical axis.

level at which the service is provided ($a = 1$), the centralized solution is clearly Pareto optimal for both local authorities. However, if the process of decentralization and more autonomy changes the balance of power, and the level of solidarity decreases ($a < 1$), the richest region can be better off again in decentralization. In Appendix B, we show that in this case, the threshold for the Gini coefficient changes to

$$Z^{RB}(\alpha, a) = \frac{Z^{EB}(\alpha)}{1-a} + \frac{1-\alpha}{2(1-a)}.$$  \hspace{1cm} (10)

Note that $\frac{1}{1-a} \geq 1$, and thus, from (10) $Z^{RB} > Z^{EB}$. For $a = 1$, the expression has no finite solution. In fact, in this case, the equalization grant in devolution is equal to the implicit grant paid by the rich local authority to the poor one in centralization. This means that the only effect
of decentralization in this case is a reduction in the provision of the local public good, which causes a welfare loss.

4 Discussion and policy implications

Our framework may offer an alternative interpretation to the recent claims for more devolution at local level. In particular, they may derive from a reduction in solidarity among regions rather than an efficiency improvement in producing local public goods. Blöchliger and Charbit (2008) show that: (i) several systems are available, (ii) they often coexist, and (iii) only a few systems use pure resource-based equalization grants. In the presence of an expenditure-based equalization grant, whenever \( GINI \) in Equation (9) is greater than \( Z_{EB} \), the claim may derive from a reduction in solidarity. Lessmann (2012) estimates the \( GINI \) for some countries, while an estimation for the spillover parameter \( \alpha \) is more difficult to obtain. In fact, the level of spillover depends on both the nature of the expenditure and local characteristics (see Revelli, 2015). Solé-Ollé (2006) estimates an average value of spillover equal to 0.329, with a range of variation between 0.141 and 0.675, according to the type of municipality.

Table 2 shows the Gini estimated by Lessmann (2012) for a sample of countries. \( \alpha^* \) in the second column is the minimum level of spillover for which the richest region prefers centralization to devolution. The third column shows the probability that a decentralization claim in each country is driven
Table 2: Revenue dispersion and decentralization claims. The Gini is as in Lessmann (2012). $\alpha^*$ is the solution to $Z^{EB}(\alpha^*) = GINI$ and $P$ is the probability that a claim for decentralization comes from a reduction in solidarity.

<table>
<thead>
<tr>
<th>Country</th>
<th>GINI</th>
<th>$\alpha^*$</th>
<th>$P$</th>
<th>Country</th>
<th>GINI</th>
<th>$\alpha^*$</th>
<th>$P$</th>
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<td>Austria</td>
<td>0.14</td>
<td>0.404</td>
<td>0.808</td>
<td>Canada</td>
<td>0.16</td>
<td>0.249</td>
<td>0.498</td>
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<td>0.900</td>
<td>USA</td>
<td>0.14</td>
<td>0.404</td>
<td>0.808</td>
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<td>0.774</td>
<td>Iran</td>
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<td>1</td>
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<td>0.956</td>
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<td>&gt;0.5</td>
<td>1</td>
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<td>0.423</td>
<td>0.846</td>
<td>Malta</td>
<td>0.14</td>
<td>0.404</td>
<td>0.808</td>
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<td>India</td>
<td>0.22</td>
<td>&gt;0.5</td>
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</tbody>
</table>
by reduction in solidarity.\textsuperscript{1}

This means that for a country like Belgium (with $\alpha^* = 0.495$), if the grant is expenditure based, the richest region is likely to gain from decentralization only if the good produced is a public good ($\alpha = 0.5$). In countries like Sweden (with $\alpha^* = 0.2$), the spillover threshold can be much lower for the richest region to prefer centralization. The figures in Table 2 allow us to conclude that decentralization is often advocated in countries where differences in regional income are significant (Belgium, Italy, and Latin American countries). In these countries, the observed reduction in regional redistribution is the objective that local Governments want to pursue rather than it being a consequence of fiscal federalism. The only significant exception is the UK, where decentralization is advocated by poorer regions. In this case, historical reasons may prevail over economic factors.

When equalization is resource based, the policy implications of our findings are interesting. First, if the central government does not change the parameters of the equalization formula ($a = 1$), the richer region has no interest in asking for decentralization. In any case, the central government may set $a$ at a “sufficiently high” level in Equation (10) to reduce claims deriving from reduction in solidarity. From equation 10, we can, in fact, obtain the following condition

$$a > 1 + \frac{1}{2} \ln \left(1 - \frac{\alpha}{GINI}\right) + \frac{\alpha}{GINI},$$

which depends on the value of the spillover ($\alpha$) and on the shape of the

\textsuperscript{1}The probability $\mathbb{P}$ is defined as $\mathbb{P} = \frac{\alpha}{\alpha^*}$ since $\alpha \in \left[0, \frac{1}{2}\right]$ and, accordingly, the domain for $\mathbb{P}$ is $[0, 1]$, which can be interpreted as a probability.
income distribution.

Finally, our model suggests that equalization grants based on income rather than expenditure should be preferred because they reduce the strategic behavior of wealthy regions in setting low expenditure levels. In this light, both the equalization system used in Germany for healthcare and the recently implemented Swiss reform seem to be heading in the right direction (OECD-WHO (2011))

References


A Derivation of the results presented in Table 1

A.1 Centralisation

We can substitute 5 into 4 and we can write

\[ W^C = Y_A \left(1 - \frac{v_A g_A + v_B g_B}{Y_A + Y_B}\right) + \lambda_A \left((1 - \alpha_A) \ln g_A + \alpha_A \ln g_B\right) + Y_B \left(1 - \frac{v_A g_A + v_B g_B}{Y_A + Y_B}\right) + \lambda_B \left((1 - \alpha_B) \ln g_B + \alpha_B \ln g_A\right), \]
The FOCs can be written as:

\[
\frac{\partial W^C}{\partial g_A} \bigg|_{g_A = g^*_A} : -v_A + \lambda_A \frac{1 - \alpha_A}{g_A^*} + \lambda_B \frac{\alpha_B}{g_A^*} = 0,
\]

\[
\frac{\partial W^C}{\partial g_B} \bigg|_{g_B = g^*_B} : -v_B + \lambda_B \frac{1 - \alpha_B}{g_B^*} + \lambda_A \frac{\alpha_A}{g_B^*} = 0.
\]

from which the results presented in Table 1 are obtained.

A.2 Derivation of the conditions for Decentralisation

We can substitute 7 into 6 to write:

\[
W^D_i = Y_i - v_i g_i + G_i + \lambda_i ((1 - \alpha_i) \ln g_i + \alpha_i \ln g_j)
\]

The FOCs can be written as:

\[
\frac{\partial W^D_i}{\partial g_i} \bigg|_{g_i = g^*_i} : \lambda_i \frac{1 - \alpha_i}{g_i^*} - v_i = 0,
\]

from which the results presented in Table 1 are obtained.

B Derivation of the welfare difference

The optimal levels for \(g,G\), and \(\tau\) can be substituted back into equation (6) to obtain:

\[
W^D = W^D_A + W^D_B = \sum_{i \neq j = \{A,B\}} Y_i - \lambda_i (1 - \alpha_i) + \lambda_i \left( (1 - \alpha_i) \ln \frac{\lambda_i (1 - \alpha_i)}{v_i} + \alpha_i \ln \frac{\lambda_j (1 - \alpha_j)}{v_j} \right).
\]
Analogously, we can use the results presented in Table 1 to write the optimal level of welfare for a centralised system:

\[ W^C = \sum_{i \neq j \in \{A,B\}} Y_i - \lambda_i + \lambda_j \left( (1 - \alpha_i) \ln \frac{\lambda_i (1 - \alpha_i)}{v_i} + \alpha_i \ln \frac{\lambda_j (1 - \alpha_j) + \lambda_i \alpha_i}{v_j} \right). \]

In both cases, since \( G_A = -G_B \), the grant has no effect on the total welfare.

**Total welfare**

The difference between \( W^C \) and \( W^D \) is:

\[ W^C - W^D = \sum_{i \neq j \in \{A,B\}} \lambda_i \left( (1 - \alpha_i) \ln \frac{\lambda_i (1 - \alpha_i)}{\lambda_i (1 - \alpha_i)} + \alpha_i \ln \frac{\lambda_j (1 - \alpha_j) + \lambda_i \alpha_i}{\lambda_j (1 - \alpha_j)} \right) - \lambda_j \alpha_j. \]

This difference is positive because of the spillover effects (Tresch, 2002, Chapter 5). The optimal quantity \( g_i^* = \frac{\lambda_i(1-\alpha_i)}{v_i} \) leading to \( W^D \) is in the set of the feasible choices for \( W^C \). This implies that if it has not been chosen, it does not maximise welfare. This result can be used to determine the sign of the difference for each Region.

**Region A**

For Region A the welfare difference is
\[ W_A^C - W_A^D \]
\[ = \lambda_A \left( (1 - \alpha_A) \ln \frac{\lambda_A (1 - \alpha_A) + \lambda_B \alpha_B}{\lambda_A (1 - \alpha_A)} + \alpha_A \ln \frac{\lambda_B (1 - \alpha_B) + \lambda_A \alpha_A}{\lambda_B (1 - \alpha_B)} \right) \]
\[ - \lambda_A + \lambda_B \frac{Y_A + Y_B}{Y_A + Y_B} Y_A + \lambda_A (1 - \alpha_A) + (1 - \beta) \frac{\lambda_A (1 - \alpha_A) + \lambda_B (1 - \alpha_B)}{2 (Y_A + Y_B)} (Y_A - Y_B) \]
\[ + \beta \frac{1}{2} \bar{\tau} \sigma (Y_A - Y_B). \]

The first term is of course positive. The sign of the difference depends on the change in the equalisation grant which in turn depends on the income gap and on the form of equalisation chosen.

For \( \beta = 0 \), the grant is expenditure based and the difference can be written as

\[ W_A^c - W_A^d \]
\[ = \lambda_A \left( (1 - \alpha_A) \ln \frac{\lambda_A (1 - \alpha_A) + \lambda_B \alpha_B}{\lambda_A (1 - \alpha_A)} + \alpha_A \ln \frac{\lambda_B (1 - \alpha_B) + \lambda_A \alpha_A}{\lambda_B (1 - \alpha_B)} \right) \]
\[ - \lambda_A + \lambda_B \frac{Y_A + Y_B}{Y_A + Y_B} Y_A + \left( \lambda_A (1 - \alpha_A) + \frac{\lambda_A (1 - \alpha_A) + \lambda_B (1 - \alpha_B)}{2 (Y_A + Y_B)} (Y_A - Y_B) \right), \]

and this difference is negative if

\[ \frac{Y_i}{Y_A + Y_B} - \frac{1}{2} \geq \frac{(1 - \alpha_A) \ln \frac{\lambda_A (1 - \alpha_A) + \lambda_B \alpha_B}{\lambda_A (1 - \alpha_A)} + \alpha_A \ln \frac{\lambda_B (1 - \alpha_B) + \lambda_A \alpha_A}{\lambda_B (1 - \alpha_B)} + \frac{1}{2} \left( \lambda_A (1 - \alpha_A) - \lambda_B (1 - \alpha_B) \right)}{\lambda_A \alpha_A + \lambda_B \alpha_B} - \frac{1}{2}, \]

When \( \lambda_i = \lambda_B = \lambda \), the result is simplified:

\[ GINI > \frac{(1 - \alpha_A) \ln \frac{(1 - \alpha_A) + \alpha_B}{(1 - \alpha_A)} + \alpha_A \ln \frac{(1 - \alpha_B) + \alpha_A}{(1 - \alpha_B)} + 1 \ln \frac{(1 - \alpha_A) - (1 - \alpha_B)}{(\alpha_A + \alpha_B)} \frac{1}{2}}{\alpha_A + \alpha_B} - \frac{1}{2} \]
and for $\alpha_i = \alpha_B = \alpha$, we can write

$$GINI > -\frac{\ln (1 - \alpha)}{2\alpha} - \frac{1}{2}.$$  

For $\beta = 1$, the grant is resource based and the difference can be written as

$$W^C_A - W^D_A = \lambda_A \left( (1 - \alpha_A) \ln \frac{\lambda_A (1 - \alpha_A) + \lambda_B (1 - \alpha_B)}{\lambda_A (1 - \alpha_A)} + \alpha_i \ln \frac{\lambda_B (1 - \alpha_B) + \lambda_A \alpha_A}{\lambda_B (1 - \alpha_B)} \right)$$

$$\tilde{\tau}^* Y_A + \left( \lambda_A (1 - \alpha_A) + \frac{\tilde{\tau}^* a (Y_A - Y_B)}{2} \right)$$

which is negative if

$$GINI > \frac{(1 - \alpha_A) \ln \frac{\lambda_A (1 - \alpha_A) + \lambda_B \alpha_B}{\lambda_A (1 - \alpha_A)} + \alpha_A \ln \frac{\lambda_B (1 - \alpha_B) + \lambda_A \alpha_A}{\lambda_B (1 - \alpha_B)} + \frac{\alpha_A}{\lambda_A + \lambda_B} (1 - \alpha_A) - \frac{1}{2}}{Z^{EB}(\lambda_A, \lambda_B, \alpha_A, \alpha_B)}.$$

In the case of perfect symmetry (i.e. $\lambda_A = \lambda_B = \lambda$ and $\alpha_A = \alpha_B = \alpha$) we have

$$GINI > \frac{1}{(1 - a)} \left( -\frac{\ln (1 - \alpha)}{\alpha} - \frac{1}{2} + \frac{1}{2} (1 - a) \right) = \frac{Z^{EB}(\alpha)}{1-a} + \frac{1}{2} \frac{1 - \alpha}{1 - a}$$

We see that the new threshold is strictly proportional to the previous one. The new threshold is highest (and positive) for $a = 1$ and lowest for $a = 0$. The latter case can be interpreted as secession.
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