Emergence of Asymmetric Fiscal Federalism: Centrifugal and Centripetal Forces

Floriana Cerniglia∗ Riccarda Longaretti† Alberto Zanardi‡

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Abstract

In this paper we provide a simple analytical model that clarifies algebraically the interplay between regional specificity and efficiency/economies of scale, in shaping the demand and the emergence of asymmetric fiscal federalism. We derive in particular that the variance and skewness of the distribution of income across regions are key factors together with regional average income in the resulting institutional set-up.

Keywords: Asymmetric fiscal federalism, Distribution of income, Fiscal flows

JEL classification: H4, H7.

1 Introduction

The division of policy-making authority between central governments and regional governments within a country reasonably reflects the interplay between differences in regional demands for public goods and services, and the economies of scale of producing those goods and services. Asymmetries in the powers of regional governments are likely to occur whenever there are substantial differences in service demands among regional governments. Physical, historical, economic differences across regions affect demands for public goods and services, and responsive local governments could be willing to provide different levels and combinations of services to meet those demands.

In the literature economic efficiency has been the central argument for fiscal federalism, based on two complementary assumptions: i) local governments are better positioned than the central government to deliver public services efficiently since they are presumably much closer to the citizens of their respective jurisdictions, ii) citizens can sort themselves into the jurisdictions that best match their preferred tax-expenditure package, and consequently this stimulates competition among local governments to attract the mobile tax base. Nevertheless, so far, in the literature, either the division of policy-making power is assumed to be uniform and exogenously determined, or unchanging once assigned.

Equal and permanent assignments of policy making power are convenient assumptions in mathematical models and in theories of constitutional design. However unequal, or asymmetric, assignments of political power to local governments are likely outcomes. A number of asymmetries within federal systems can be studied. Regional governments often vary widely in physical size, population, income levels and political power among regional governments. The division of policy-making authority between central and regional governments varies from time to time and also from place to place both within federal and unitary countries.

The aim of this paper is to present a model that sketches-out the demand for more regional autonomy over the allocation of some public goods. In the literature such demand for higher regional autonomy

∗DISEIS, Università Cattolica del Sacro Cuore, Milan
†Corresponding author. DEMS, University of Milan-Bicocca, riccarda.longaretti@unimib.it
‡Italian Parliamentary Budget Office and University of Bologna
can give rise to what is called asymmetric fiscal federalism, namely a situation such that, within a nation, different areas of competency may be assigned to the various regions of the country. In most general terms and in the literature, in a country, demands for regional autonomy can be a function of some differences (historical, cultural, political, and also economic) between the center and the regions or among regions.

In this paper we highlight only the role played by economic determinants, and in particular we focus on the role played by the distribution of income across regions. To address this issue, we consider a country composed of three regions, that differ in income. We derive that the regional demand for the public good depends on regional income and on fiscal flows, namely the difference between what the individuals of each region receive in terms of public good and what they actually pay in taxes to the central government. As fiscal flows consent an inter-regional redistribution of resources, it is quite straightforward that demand for regional autonomy comes from the richest region, that aims to reduce its own fiscal flow. For instance, this is in accordance with what we have observed in practice in some countries (Spain, Italy, Canada and Belgium).

Moreover, our results will show that also when income differs substantially across regions (that is the inter-regional distribution of income exhibits high variance or high right-skewness), fiscal flows may lead to asymmetric fiscal federalism.

The paper is organized as follows: Section 2 presents the set-up; Section 3 presents circumstances under which the richest region demands higher autonomy; Section 4 explores the possible rise of asymmetric fiscal federalism; Section 5 concludes.

2 The set-up

Let us assume that in a centralized economy there exist three regions \((i = 1, 2, 3)\). Individuals are identical inside each region \(i\). Each region has income \(Y_i\). Region 3 is richer than region 2, that in turn is richer than region 1, that is \(Y_1 < Y_2 < Y_3\).

These three regions belong to a country, where there exist two substitute goods, one of which can be publicly provided (we can think about education). Let \(C_i\) be the private good and \(G_i\) be the publicly provided private good, and \(G_{in}\) is instead the public good provided by the national government and targeted to region \(i\).

Notice that, with centralization, the preference-revelation mechanism (or constitutional rules) restricts the government to offer a uniform quantity of public good.\(^1\) Besides, under centralization, the level of public provision would be an average of the regional demands.\(^2\) The public good is financed by the fiscal capacity of all regions, with a marginal tax rate \(\tau\).

The marginal cost of producing \(G_{in}\) is constant and equal to \(MC_n\).

Individual preferences depend on the level of both goods:

\[
U_i = U(C_i, G_i) \tag{1}
\]

As \(G_i\) is centrally provided, the national government budget constraint is:

\[
P_n G_n = \tau \Sigma_i Y_i \tag{2}
\]

Each individual of each region benefits equally of the public good. Since \(G_{in}\) is expenditure for the public good targeted to each region \(i\), it follows that:

\[
P_n \Sigma_i G_{in} = \tau_n \Sigma_i Y_i \tag{3}
\]

\(^1\)Namely \(G_{1n} = G_{2n} = G_{3n}\)

\(^2\)Cerniglia and Longaretti 2015 demonstrate that this mechanism is equivalent to the standard utilitarian maximizer solution, as far as the individual demands are linear differs from the "median voter" choice as far as the distribution of income is asymmetric.
This equation can be rewritten in terms of fiscal flows, namely the difference between what the individuals of each region receive in terms of public good and what they actually pay in taxes to the central government. Let us now define $FF_i$ the fiscal flow for region $i$. More precisely, under centralization, $FF_{in} = P_nG_{in} - \tau_iY_i$. The fiscal flows may be negative (positive), according to the level of public good effectively provided and according to the regional income: it is positive if $\tau_iY_i < P_nG_{in}$, whereas it is negative if $\tau_iY_i > P_nG_{in}$.

$$\Sigma_i FF_{in} = 0$$

Therefore:

$$P_nG_{in} + \Sigma_{-i} FF_{-in} = \tau Y_i$$

As for $C_i$:

$$P_cC_i = (1 - \tau)Y_i$$

From eqs. (7) and (8) it follows the regional budget constraint under centralization:

$$P_nG_{in} + P_cC_i = Y_i - \Sigma_{-i} FF_{-in}$$

Therefore, the problem of the representative individual of each region $i$ is:

$$Max_{C_i,G_i} U_i$$

subject to the budget constraint (eq. 7).

Regional demand for public good $G_i$, when it is nationally provided follows:

$$P_{in} = U'(G_{in}, Y_i, FF_{-in})$$

The important result of this simple algebraic framework is that each regional demand is increasing in regional own income and in fiscal flows.

As we will show below, fiscal flows are therefore a double-edged sword: on one hand perfect inter-regional redistribution of resources guarantees that individuals living in poorer regions may afford a reasonable level of public good, on the other hand perfect inter-regional redistribution may be an incentive for individuals living in rich regions to demand regional autonomy.

3 Centrifugal forces for the richest region

When we analyze the demand for regional provision of the public good, we have to consider two effects: (1) a "regional specificity" effect, related to the demands for the public good, that differ across regions; (2) an "efficiency/economy of scale" effect, capturing a reduction in producing public good in a centralized setting.

A region prefers to provide autonomously the public good, when effect (1) dominates effect (2). We now aim to study these centrifugal forces for each region, considering in turn an increase in the mean, in the variance, and in the skewness of the distribution of income across regions.

If the public good is regionally provided, regional demand for public goods comes, again, from the maximization of the utility function eq. (1). The public goods is regionally provided according to regional preferences, and is still financed by the fiscal capacity (pooling) of all regions.

Let us start by studying the centrifugal forces for the rich region, indexed as 3.

Following the same rationale of last paragraph, we get the following.

$$P_{ii}\Sigma_i G_{ii} = \tau \Sigma_i Y_i$$

This equation can be rewritten in terms of fiscal flows that come from other regions $FF_{-i}$. Therefore:

$$P_{ii}G_{ii} + \Sigma_{-i} FF_{-i} = \tau Y_i$$

As for $C_i$:

$$P_cC_i = (1 - \tau)Y_i$$
It follows:

\[ P_{ii}G_{ii} + P_{ci}C_i = Y_i - \Sigma_{-i}FF_{-i} \]  \hspace{1cm} (13)

Therefore, the problem of the representative individual of each region \( i \) is:

\[ Max_{G_i} U_i \]  \hspace{1cm} (14)

subject to the budget constraint (eq. ).

Regional demand for public good \( G_i \), follows:

\[ P_{ii} = U'(G_{ii}, Y_i, FF_{-i}) \]  \hspace{1cm} (15)

Therefore \( P_{ii} = P_{in} \) and we denote it as \( P_i \)

We now have to introduce the supply side.
As for the supply side under centralization, public good provision comes straightforward from its marginal cost:

\[ P_{in} = MC_{in} \]  \hspace{1cm} (16)

 Whereas, under federalism, public good provision is:

\[ P_{ii} = MC_{ii} \]  \hspace{1cm} (17)

We now want to understand if and when effect (1) prevails on effect (2) for the rich region. This occurs if the consumer surplus in providing the public good regionally is higher than the consumer surplus deriving from a centralized provision of the public good.

In figure 1 we depict three different scenarios, according to different distribution of income.
In all cases, for the sake of graphical representation, we assume that average income coincides with the income of region 2.
Both in panel "a" and in panel "b" we consider uniform distribution of income across the three regions, but in panel "b" the variance of the distribution is higher. In panel "a" the rich region is likely to prefer a centralized state: the net gain from centralization is the rectangle BCDE. As the variance of the distribution of income increases (panel "b"), centrifugal forces are more likely to prevail for rich regions: this occurs as long as the triangle FBG is greater than the rectangle CDEG.
In panel (c), we consider a skewed-right distribution of income. The rich region is also the less populated. In this case, once again, centrifugal forces are more likely to prevail for rich regions, since the triangle FBG is greater than the rectangle CDEG.
4 Emergence of asymmetric fiscal federalism

Once the rich region has decided to provide regionally the public good, regions 1 and 2 evaluate the opportunity of providing the public good together or separately. As shown in Figure 2, if they provide it together, the resulting institutional set-up is "asymmetric fiscal federalism". If they provide it separately, the resulting institutional set-up is "symmetric fiscal federalism".

Figure 1: The effects of the distribution of income on the centrifugal forces for the rich region
In the system of two regions (1 and 2), the government offers a uniform quantity of public good, and, similarly as in centralization, the level of public provision would be an average of the demands of the two regions. Region 2 would decide to offer the public good independently as long as the consequent consumer surplus prevails the consumer surplus associated with the joint provision by regions 1 and 2. Once again, the result depends on the prevailing effect between the "regional specificity" effect and the "efficiency/economy of scale" effect, since it likely there still exist economies of scale in jointly providing the public good, that is $MC_{i,j} < MC_{ii}$. In Figure 3, we depict a possible outcome, given a uniform distribution of income. In the figure, asymmetric fiscal federalism emerges as long as the light green rectangle is higher than the dark green triangle.

5 Conclusions

In this paper we have developed an analytical model that aimed to clarify algebraically the interplay between regional specificity and efficiency/economies of scale, in shaping the demand and the emergence of asymmetric fiscal federalism. We have focused on the role played by the distribution of income across regions in shaping the demand for higher regional autonomy and in determining the rise of asymmetric fiscal federalism. We have derived in particular that the variance and skewness of the distribution of income across regions are key factors together with regional average income in the resulting institutional set-up.
References


