

Fiscal federalism, patient mobility and the soft budget constraint: a theoretical approach.

Rosella Levaggi - Francesco Menoncin

Dipartimento di Scienze Economiche

Università degli Studi di Brescia

BACKGROUND

- Reforms in public health care systems
- Regionalisation of expenditure, i.e. fiscal federalism
 - Need to control expenditure and its composition
 - Resources equalisation

BACKGROUND

The traditional literature on fiscal federalism deals with local public goods

Health care is something quite different:

- Impure public good
- Merit good

The provision of these goods opens a very interesting debate on fiscal federalism as regards local taxes and grants in aid.

MOTIVATION

The organisation of health care provision in Italy and especially its finance has quite peculiar characteristics.

Two elements in particular:

- a) Soft budget constraint
- b) Patient's mobility

	Tax revenue (%total evenue)	admission from other regions	Of which nearby	admission to other regions	Of which nearby	Mobility balance	Surplus/Deficit (per capita)
Piedmont	0,403	5,6	0,55	5,6	0,55	-19,003	-0
Aosta Valley	0,403	5,7	0,48	5,7	0,48	-16,282	-111
Lombardy	0,608	8,2	0,44	8,2	0,44	438,503	0
Bolzano	0,411	11,8	0,64	11,8	0,64	6,600	49
Trento	0,416	8,8	0,66	8,8	0,66	-15,381	-4
Veneto	0,491	7,6	0,54	7,6	0,54	116,280	-41
Friuli V.g.	0,409	11,5	0,64	11,5	0,64	15,520	12
Liguria	0,336	9,9	0,57	9,9	0,57	-19,052	-159
Emilia R.	0,486	10,2	0,46	10,2	0,46	270,712	14
Tuscany	0,399	10,7	0,38	10,7	0,38	103,664	5
Umbria	0,308	17,2	0,71	17,2	0,71	27,252	8
Marche	0,390	8,6	0,52	8,6	0,52	-44,959	-11
Lazio	0,524	8,0	0,49	8,0	0,49	42,503	-265
Abruzzo	0,275	9,0	0,50	9,0	0,50	17,377	-152
Molise	0,120	16,0	0,92	16,0	0,92	0,261	-247
Campania	0,211	2,4	0,51	2,4	0,51	-260,570	-248
Puglia	0,237	2,7	0,60	2,7	0,60	-153,548	-16
Basilicata	0,112	12,9	0,89	12,9	0,89	-53,928	-53
Calabria	0,100	2,5	0,24	2,5	0,24	-210,573	-27
Sicily	0,239	1,5	0,00	1,5	0,00	-195,353	-103
Sardinia	0,287	0,8	0,00	0,8	0,00	-50,023	-155
ITALY	0,395					0,000	-4.387,116

...cont

Several explanations are possible. A pure soft budget constraint motivation probably too naive

We argue that the soft budget constraint is a solution of a Nash game between regions with excess capacity and the one that are less efficient.

INTERPRETATION

The less efficient local authorities prefer to send their citizens to receive services outside their region instead of becoming more efficient.

The more efficient region, due to the shape of its utility function, prefers to produce more goods than are locally needed.

The lack of coordination between local objectives and total welfare means that this policy is optimal at local level, but inefficient at Central Government level.

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The outcome of such game is a welfare loss.

There are in fact two clear losers:

- a) the whole community, which would be better-off if hard budget constraint rules were imposed;
- b) the users of the services in the regions where soft budget constraint is widespread who have to travel and incur private costs.

RELATED LITERATURE

- WILDASIN (2004)
- LEVAGGI AND ZANOLA (2003)
- BORDIGNON AND TURATI (2006)

THE MODEL

Country is divided into two local authorities

Fixed quantity of health care $\frac{S}{2}$

Financed through a linear income tax

δ_i

δ_i

$i \in \{A, B\}$

Identical δ_i but in their income and the cost to produce health care.

Local authority A is richer and more efficient so that the same level of fiscal effort produces more services in A than in B.

Need for health care: $\frac{S}{2}$.

Income fixed: Y_A Y_B $Y_A + Y_B$

Marginal costs to produce health are equal to

$$v_A < v_B$$

Utility

$$U_i = Y_i - z_i S_i - \frac{1}{2} S_i^2,$$

$$z_B = \frac{S_B}{2}$$

$$z_A = \frac{S_A}{2}$$

CENTRAL GOVERNMENT DECISION

$$\max_{S_A, S_B, t} \left\{ Y_A \left(1 - t \frac{v_B}{z_A} S_A - \frac{1}{2} S_A^2 \right) - Y_B \left(1 - t \frac{v_B}{z_B} S_B - \frac{1}{2} S_B^2 \right) \right\},$$

s.t.

$$v_A S_A = v_B S_B + t Y_A = Y_B$$

$$S_A = S_B = S.$$

$$S_A^C = \frac{S}{2} \left(\frac{z_A}{z_B} \frac{v_B}{v_A} \right),$$

$$S_B^C = \frac{S}{2} \left(\frac{z_A}{z_B} \frac{v_B}{v_A} \right),$$

$$t = \frac{1}{2} \frac{S \left(\frac{v_B}{z_A} - \frac{v_B}{z_B} \right)}{Y_A - Y_B},$$

$$S_I^C = S_A^C = S_B^C = \frac{z_A}{z_B} \frac{v_B}{v_A}.$$

Grants-in-aid and local taxes

$$d \equiv \frac{1}{Y_A} \frac{S}{2} v_A,$$

$$d \equiv \frac{v_B S_B^C \equiv v_A S_A^C}{Y_A \equiv Y_B} \rightarrow \frac{1}{Y_A} \frac{S}{2} v_A,$$

$$G_B \equiv v_B S_B^C \equiv v_A S_A^C \rightarrow \frac{Y_B \equiv Y_A}{Y_A} \frac{S}{2} v_A.$$

Decentralised decision Hard Budget constraint

$$\max_{S_B, \phi_B} \left\{ Y_B \left(\frac{S}{2} S_B - \frac{1}{2} S_B^2 \right) \right\},$$

s.t.

$$v_B S_B \leq p_A \left(\frac{S}{2} S_B \right) \leq Y_B \leq G_B.$$

$$\phi_B \leq \frac{v_B \frac{S}{2} S_B}{Y_B}.$$

$$\frac{S}{2} S_B^D \leq v_B p_A,$$

$$\max_{p_A, \delta_A} \left\{ Y_A \left(\frac{S}{2} v_B p_A \right) - \frac{1}{2} \left(\frac{S}{2} v_B p_A \right)^2 \right\},$$

s.t.

$$v_A \frac{S}{2} p_A - p_A v_B p_A = Y_A.$$

$$p_A = \frac{1}{3} \left(v_A \frac{S}{2} - 2v_B \right),$$

$$\delta_A = \frac{v_A \frac{S}{2} p_A - p_A v_B p_A}{Y_A}$$

$$p_A \left[v_A - v_B \right] = \frac{1}{2} \left(z_A - \frac{S}{2} \right)$$

$$S_I^D * S_A^D - S_B^D \left(\frac{S}{2} - v_B - p_A \right) - \left(\frac{S}{2} - v_B - p_A \right) \left[2v_B - p_A \right] \\ = \frac{2}{3} \left(v_B - v_A - z_A - \frac{S}{2} \right)$$

$$S_I^D * \frac{2}{3} \left(v_B - v_A - z_A - \frac{S}{2} \right) = S_I^C * v_B - v_A - z_A - \frac{S}{2},$$

SOFT BUDGET CONSTRAINT

$$v_B \left(\frac{S}{2} - S_I^D \right) \equiv S_I^D v_A + Y_B \lambda \equiv G_B \equiv S_I^D r v_A.$$

$$\lambda \equiv \frac{S_I^D (1 - r) v_A - G_B}{Y_A - Y_B}.$$

LOCAL AUTHORITY B

$$\max_{r, \phi_B} \left\{ Y_B \left(1 - \frac{S_I^D (1+r) Y_A + G_B}{Y_A + Y_B} \phi_B \right) - v_B \left(\frac{S}{2} - S_I^D \right) - \frac{1}{2} \left(\frac{S}{2} - S_I^D \right)^2 \right\}$$

s.t.

$$v_B \left(\frac{S}{2} - S_I^D \right) = S_I^D r v_A + G_B - Y_B \phi_B$$

$$r \geq 0$$

$$\phi_B \geq \frac{v_B \left(\frac{S}{2} - S_I^D \right) + G_B}{Y_B}.$$

LOCAL AUTHORITY A

$$Q = \frac{S_I^D \cdot r \cdot v_A \cdot G_B}{Y_A \cdot Y_B}$$

$$\max_{S_I^D} \left\{ Y_A \left(1 - \frac{S_I^D \cdot r \cdot v_A \cdot G_B}{Y_A \cdot Y_B} - \frac{v_A \cdot \frac{S}{2}}{Y_A} \right) - z_A \left(\frac{S}{2} - S_I^D \right) - \frac{1}{2} \left(\frac{S}{2} - S_I^D \right)^2 \right\}$$

$$S_I^D = \left(z_A - \frac{S}{2} \right) + \frac{Y_A}{Y_A \cdot Y_B} v_A \cdot r$$

EQUILIBRIUM

$$r = 0$$

$$S_I^A \left(z_A - \frac{1}{2} S \right) - \frac{Y_A}{Y_A + Y_B} v_A = S_I^C \frac{1}{2} \left[\left(z_A - \frac{S}{2} \right) - v_B \right]$$

$$= \frac{v_B \left(\frac{S}{2} - S_I^D \right) - G_B}{Y_B}$$

$$d_A = d$$

$$d = \frac{v_A}{Y_A + Y_B} \left(z_A - \frac{1}{2} S - Y_A \frac{v_A}{Y_A + Y_B} \right)$$

DISCUSSION

- Decentralised solution not first best in this context
- The net gainer of the soft budget constraint policy is not necessarily the local authority that incurs in the deficit
- Lack of coordination in the policy and fiscal illusion create this problem

Parameters	Y_A	Y_B	v_A	v_B	S	z_A	z_B
Value	150	100	1	1.3	20	13	10

Table 1: Simulation results

Parameters	Centralised	HBC-1	HBC-2	SBC
p_A	-	1	0.2	1
r	-	-	-	0
S_A^C	11.65	10.3	11.1	12.4
S_B^C	8.35	9.7	8.9	7.6
t	0.090	-	-	-
τ_c	0.066	0.023	0.023	0.032
τ_A	0.023	0.066	0.072	0.066
τ_B	0.023	0.070	0.059	0.040
G_B	5.838	5.838	5.838	5.838
U_A	220.08	217.35	218.31	219.37
U_B	139.63	140.54	141.10	139.73
U_T	359.72	357.90	359.42	359.16

THE EXAMPLE

The presence of a soft budget constraint is welfare decreasing for the community as a whole, but it shares the benefits between the two local authorities in ways that have not been explored so far. The real winner is in fact A, the local authority that respects its budget and that appears to be the virtuous one.

CONCLUSIONS

- Soft budget constraint arises from a bargaining solution between the Regions in which they anticipate that the deficit will have to be covered at central level.
- The use of a soft budget constraint along with passive mobility in fact reduces total welfare of the population that has to move and usually this aspect is not sufficiently taken into account by the decision makers
- The distribution of the benefits may be different from what expected