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Why Are Representative Democracies Fiscally Irresponsible?

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ABSTRACT

We develop a model of a representative democracy in which a legislature makes collective decisions about local public goods expenditures and how they are financed. In our model of the political process legislators defer to spending requests of individual representatives, particularly committee chairmen, who tend to promote spending requests that benefit their own districts. Because legislators do not fully internalize the tax consequences of their individual spending proposals, there is a free rider problem, and as a result spending is excessively high. This leads legislators to prefer a higher level of debt to restrain excessive future spending.

We develop a model of a representative democracy. In the model, a legislature makes collective decisions about local public goods expenditures and how they are financed. In particular, the legislature makes decisions on how much of the expenditures should be financed by current taxes and how much should be debt financed. Our model of the legislature is motivated by the arguments in Weingast, Shepsle, and Johnsen (1981). These authors argue that under traditional practice in the U.S. Congress, members defer to spending requests of individual representatives, particularly committee chairmen, who tend to promote spending requests that benefit their own districts. Using a model with this feature, we show that debt levels chosen by a legislature may exceed the optimal level. Legislators prefer a higher level of debt to restrain excessive future spending.

Our results are similar to those in Persson and Svensson (1989). In their case, the result is due to the assumption that the policymaker is uncertain about whether he or she will continue in office and wishes to restrain spending decisions by future policymakers. In contrast, in our model there is a free rider problem in that spending by each committee chairman is excessively high. Thus, the legislature unanimously prefers debt finance as a way of reducing such future spending, even when all legislators are certain to continue in office. Put differently, if the legislature could commit to future spending decisions, the equilibrium level of debt is optimal, though the spending levels are not. In the absence of commitment, the legislature uses debt as a way to discipline future spending. It is this inability to commit to future spending decisions that leads to excessive debt finance.

The model we present explains how restructuring of the committee system in Congress in the 1970's led to the increase in both government expenditures and deficit finance which occurred in the 1980's and the early part of the 1990's. The Congressional restructuring had the avowed purpose of seeking to make the Congress more democratic. In order to accomplish this goal the concentration of power in the hands of a few powerful committee chairmen was reduced.[1] We argue that the effect of the more even distribution of political power was to exacerbate the free rider problem inherent in legislative outcomes that were being voted upon given our universal system of taxation. We show that this can simultaneously help to explain the increase in expenditures and the increase in deficit finance that subsequently occurred.

Economy

Consider the following 2 period model. There are I districts indexed by $i = 1, \ldots, I$. Each district has a representative and a large number of private agents. The private agents within each district are all identical. Without loss of generality therefore, we assume that there is one private agent in each district. The private agent cares about consumption of a private good, c_{it}, and a local public good, g_{it}. Their preferences are given by

$$(1) \qquad \sum_{t=1}^{2} \beta^t u(c_{it} + f(g_{it})).$$

We assume that both u and f are increasing, C^2, and strictly concave. The representative of a district has the same preferences as his constituents.

The private agent in each district is endowed with $\bar{y}$ units of the private consumption good in period 1. There is a storage technology which converts 1 unit of the endowment into β^{-1} units of the second period consumption good. Thus, the interest rate in this economy, in equilibrium, is

[1]The dilution of power of the committee chairmen was undertaken through a series of reforms during the 1970's. To cite several examples in the House, the ability of the committee chairman to control the appointment of the chairmen of the different subcommittees as well as the ability of one representative to serve as the chairman of more than one subcommittee was eliminated. The chairs of the Appropriations subcommittees were to be elected. And, the number of subcommittees was greatly expanded. "Many observers have argued that the primary effect of changes made in the 1970's has been to exacerbate the fragmented nature of congressional decision making. The increased number and independence of subcommittees have caused the most stir, leading some observers to describe congressional decision making in the 1970s as 'decentralized' and as 'subcommittee government'." (Smith and Deering 1990, pP. 17-18.)

given by $R = \beta^{-1}$. This endowment good is also used for providing local public goods. The government levies uniform taxes on private agents in all districts to finance local public goods provision. We let τ_1 and τ_2 denote the tax revenues in periods 1 and 2. We assume that these taxes are distorting and model the distortions in a particularly simple way. A tax revenue of τ reduces private consumption by $x(\tau)$ where x is an increasing, convex differentiable function with $x(0) = 0$ and $x'(\cdot) > 1$.

The budget constraint of a private agent is given by

(2) $$c_{i1} + \beta c_{i2} = \bar{y} - x(\tau_1) - x(\tau_2).$$

The government's budget constraint is given by

(3) $$\Sigma_{i=1}^{I} g_{i1} + \beta \ \Sigma_{i=2}^{I} g_{i2} = I\tau_1 + \beta I\tau_2.$$

Private agents choose private consumption taking τ_1, τ_2 and the vector of local public goods provided g_1, g_2 as given. It is easy to show that these consumption levels satisfy

(4) $$c_{i1} + \beta c_{i2} = \bar{y} - x(\tau_1) - \beta x(\tau_2)$$

and

(5) $$c_{i1} + f(g_{i1}) = c_{i2} + f(g_{i2}) = \frac{1}{1 + \beta} \left\{\bar{y} - x(\tau_1) - \beta x(\tau_2) + f(g_{i1}) + \beta f(g_{i2})\right\}.$$

From equation (5) it follows that the welfare level of the representative consumer in district i can be expressed as:

(6) $$w(g_{i1}, g_{i2}, \tau_1, \tau_2) = (1+\beta)\ u\left[\frac{\bar{y} - x(\tau_1) - \beta x(\tau_2) + f(g_{i1}) + \beta f(g_{i2})}{1 + \beta}\right].$$

Note that the welfare level of the private agents in different districts differs only with regard to their consumption of the local public good/subsidy.

For future use, it is convenient to define the per capita level of government debt associated with a particular tax and spending plan. This is given by

(7) $B = 1/I \sum g_i - \tau_1.$

Planner's Choice

Consider first the allocation chosen by an egalitarian social planner. This planner's problem is to choose local public good consumption in each district and tax levels to solve the following problem:

$$\max_{(g_1,g_2,\tau_1,\tau_2)} \sum_i w(g_{i1},g_{i2},\tau_1,\tau_2)$$

subject to (3).

It is obvious that the levels of the public good/subsidy will be constant across districts within a period. Denote these levels by $\bar{g}_1$ and $\bar{g}_2$. The solution to the planner's problem is characterized by the following two conditions:

(8) $f'(\bar{g}_1) = f'(\bar{g}_2) = x'(\tau_1) = x'(\tau_2)$

(9) $(\tau_1-\bar{g}_1) + \beta(\tau_2-\bar{g}_2) = 0.$

These conditions imply that $\bar{g}_1 = \bar{g}_2 = \tau_1 = \tau_2 = g$, where g is such that $f'(g) = x'(g)$.

Political Models

We assume that the collective decision making process of the representatives works as follows. At the beginning of the first period the representatives are assigned to one of N committees where $N \leq I$. The assignment is such that each committee has at least one member. Then one member of each committee is assigned to be the chairman of that committee. We assume that these assignments are made exogenously, and for convenience we index the chairmen by $i = 1, \ldots, N$. Each chairman then chooses the public expenditure/subsidy levels in each of the districts in his committee. Then the level of the first period's tax rate is determined by a voting process in which each chairman votes for his most desired level and the median level is chosen. The second period's tax rate is determined by the government's budget constraint in the second period.

We consider two variants of our model of the political process. In the first, or commitment variant, we assume the chairmen simultaneously choose their first and second period spending levels for their districts at the beginning of the first period. In the second, or no-commitment variant, we will assume that the spending levels are chosen at the beginning of each period.

The Model with Spending Commitment

A strategy for our political game is a three-tuple $\{g_1,g_2\}$. The vectors g_1 and $g_2 \in R_+^N$ gives each chairman's choice as to the funding level in his district. The function $v(g_1,g_2) \in R_+^N$ gives the chairmen's preferred first period taxes. A strategy along with the government's budget constraint determines τ_1 and τ_2. The first period tax levy is given by median $(v(g_1,g_2)) = \tau_1$, and the level of borrowing by $\Sigma_i(g_{i1}-\tau_1) = B$. This in turn implies that the second period tax rate is given by $\Sigma_i g_{i2} + \beta^{-1}B$. An equilibrium of the model is defined in the standard fashion. We will restrict ourselves to symmetric equilibria, in which we need only determine two scalars (g_1,g_2) and one function $v \rightarrow [0,\bar{y}]$.

Given (g_1,g_2), equation (6) gives the representatives' preferences over current and future taxes. Since the representatives' preferences are identical with regard to the taxes, the equilibrium taxes are the solution to the problem of maximizing (6) with respect to τ_1 and τ_2, subject to (3). This problem is one of optimally smoothing tax distortions, and the solution is given by

$$(10) \qquad \tau_1(g_1,g_2) = \tau_2(g_1,g_2) = \left[\frac{1}{I}\sum_{i=1}^{I} g_{i1} + \frac{\beta}{I}\sum_{i=1}^{I} g_{i2}\right] / (1+\beta).$$

Each chairman's problem is to pick the level of local government spending in his district to maximize (6), where τ_1 and τ_2 are given by (10), taking as given the choices of the other chairmen as to the spending levels in their districts. The first order conditions to this problem are given by

$$(11)\qquad f'(g_{i1}) = x'(\tau_1)\,\frac{\partial\tau_1(g_1,g_2)}{\partial g_{i1}},$$

$$f'(g_{i2}) = x'(\tau_2)\,\frac{\partial\tau_2(g_1,g_2)}{\partial g_{i2}}.$$

Let $y = N/I$. In a symmetric equilibrium, using (10) and (11) implies

$$(12)\qquad f'(\hat{g}_1) = f'(\hat{g}_2) = x'(y\hat{g}_1) = x'(y\hat{g}_2),$$

where $\hat{g}_1$ and $\hat{g}_2$ denote the spending levels in the chairmen's districts. It follows that no debt is issued in equilibrium. Recall that the solution to the planner's problem yields spending levels $\bar{g}$, in each district and in each period, satisfying $f'(\bar{g}) = x'(\bar{g})$ and $\beta = 0$. The model with spending commitment has higher spending in the chairmen's districts but the effect on aggregate expenditures is ambiguous. The interesting result is that there is no intertemporal distortion.

The Model without Spending Commitment

A strategy for this political game is again a three-tuple $\{g_1,v,g_2\}$. The elements of the vector $g_1 \in R^N_+$ are in each chairman's choice as to the funding level in his district. The function $v(g_1) \in R^N_+$ gives the chairman's votes as to their preferred first period tax rate. The function $g_2(g_1,v(g_1)) \in R^N_+$ gives the chairman's desired second period funding level as a function of the first period funding levels and votes. A strategy along with the government's budget constraint once again determines τ_1 and τ_2. The first period tax levy is given by median $(v(g_1)) = \tau_1$, while the level of borrowing and the second period tax level is determined by the government's budget constraint.

We characterize the equilibrium by backward induction. The first period choices imply some level of debt B. Each chairman's problem is then to choose local government spending in his district so as to maximize (6) given that second period taxes must satisfy the government's budget constraint

$$\tau_2 = \beta^{-1}B + (1/I)\ \Sigma_{i=1}^{I}\ g_{i2}. \tag{13}$$

In a symmetric equilibrium, the levels of government spending, $\hat{g}_2$, satisfy

$$f'(\hat{g}_2) = x'(\beta^{-1}B + \eta\hat{g}_2)/I \tag{14}$$

where, again, $\eta = N/I$. Since f is concave and x is convex, it follows from (14) that $\hat{g}_2$ is decreasing in the inherited debt B.

Next, we turn to the determination of first period taxes and the debt. Each chairman faces the following problem:

$$\max_{B}(1+\beta)u\left[\frac{\bar{y} - x(\eta\hat{g}_1\text{-}B) - \beta x(\eta g_2(B) + \beta^{-1}B) + f(g_1) + \beta f(g_2(B))}{(1+\beta)}\right] \tag{15}$$

where $\hat{g}_1$ is the spending level in the first period in each chairman's district, and $g_2(B)$ is given by the solution to (14). The first order condition to this problem is

$$x'(\eta g_1\text{-}B) - x'\left(g_2(\beta) + \beta^{-1}B\right) - \beta x'\left(g_2(\beta) + \beta^{-1}B\right)\eta\ \frac{\partial g_2}{\partial B} + \beta f'(g_2)\ \frac{\partial g_2}{\partial B} = 0. \tag{16}$$

Using (14), this reduces to

$$\frac{\beta(N-1)}{I}\ x'(\tau_2)\frac{\partial g_2}{\partial B} = x'(\tau_1) - x'(\tau_2), \tag{17}$$

which can be rewritten as

$$\frac{\beta(N-1)}{I}\ \frac{\partial g_2}{\partial B} = \frac{x'(\tau_1) - x'(\tau_2)}{x'(\tau_2)}. \tag{18}$$

Since $\partial g_2/\partial B < 0$ and $x(\cdot)$ is convex, we have that $\tau_1 < \tau_2$. Equations (14), (18), and (3) implicitly determine B as a function of g_1.

Finally, the first order condition to the problem of choosing g_1 is given by

$$\text{(19)} \qquad \frac{-x'(\tau_1)}{I}[1-B'] - \frac{\beta x'(\tau_2)}{I}\left[g_2^{\prime}\, \eta B' + \beta^{-1}B'\right] + f'(g_1) + \frac{\beta f'(g_2)}{I}\, g_2^1 B' = 0.$$

Using equation (16) this equation can be rewritten as

$$\text{(20)} \qquad \frac{x'(\tau_1)}{I} - f'(g_1) = 0.$$

Equations (14) and (20) illustrate the wedge that the free-rider problem creates with respect to the choice of local government spending, as compared to the optimal choices of the social planner in equations (8) and (9). It is immediate that the only case where the private choices and those of the planner will coincide is when $N = I = 1$ and there is no free rider problem.

We can make use of equations (18) and (20) to illustrate the intertemporal distortion that arises as the chairmen try to restrain their collective second period g_2 choices by raising B:

$$\text{(21)} \qquad \frac{\beta(N-1)}{I}\frac{\partial g_2}{\partial B} = \frac{x'(\tau_1) - x'(\tau_2)}{x'(\tau_2)} = \frac{f'(g_1) - f'(g_2)}{f'(g_2)}.$$

Using (14) we have

$$\text{(22)} \qquad \frac{\partial g_2}{\partial B} = \frac{x''(\tau_2)/I\beta}{f''(g_2) - \frac{N}{I^2}x''(\tau_2)} < 0.$$

Since $\partial g_2/\partial B < 0$, (22) implies that $\tau_1 < \tau_2$ and $g_1 > g_2$, and hence that $B > 0$. The following proposition establishes that under certain conditions B is increasing in N.

<u>Proposition</u>: Suppose $K_1 = -f''/f'$ and $K_2 = x''/x'$ where K_1 and K_2 are positive constants. Then $x'(\tau_1)/x'(\tau_2)$ and $f'(g_1)/f'(g_2)$ are decreasing while B is increasing in N.

<u>Proof</u>: Using our assumptions (22) can be rewritten as

$$\frac{\partial g_2}{\partial B} = \frac{-\frac{1}{\beta}K_2}{K_1 + \frac{N}{I}K_2}. \tag{23}$$

Substituting (23) into (18) yields

$$x'(\tau_1) - x'(\tau_2) = -\frac{x'(\tau_1)(N-1)K_2}{IK_1 + NK_2},$$

or, dividing both sides by $x'(\tau_2)$

$$\frac{x'(\tau_1)}{x'(\tau_2)} = 1 - \frac{(N-1)K_2}{IK_1 + NK_2} = \frac{IK_1 + K_2}{IK_2 + NK_2}. \tag{24}$$

It is easy to see from (24) that $x'(\tau_1)/x'(\tau_2)$ is decreasing in N, and from (21) so is $f'(g_1)/f'(g_2)$. But,

$$\begin{aligned}\frac{\partial}{\partial N}\left\{\frac{x'(\tau_1)}{x'(\tau_2)}\right\} &= \frac{1}{x'(\tau_2)^2}\left\{x'(\tau_2)x''(\tau_1)\left[\frac{g_1}{I} + \frac{N}{I}\frac{\partial g_1}{\partial N} - \frac{\partial B}{\partial N}\right]\right.\\ &\qquad \left. - x'(\tau_1)x''(\tau_2)\left[\frac{g_2}{I} - \frac{N}{I}\frac{\partial g_2}{\partial N} + \frac{1}{\beta}\frac{\partial B}{\partial N}\right]\right\}\\ &= \frac{x'(\tau_1)}{x'(\tau_2)}K_2\left\{\frac{g_1 - g_2}{I} + \frac{N}{I}\left[\frac{\partial g_1}{\partial N} - \frac{\partial g_2}{\partial N}\right] - (1+\frac{1}{B})\frac{\partial B}{\partial N}\right\}.\end{aligned} \tag{25}$$

Now suppose that $\partial B/\partial N < 0$. Since $g_1 > g_2$, in order for this expression to be negative, $\partial g_2/\partial N > \partial g_1/\partial N$. But we have already established that

$$(36)\qquad 0 > \frac{\partial}{\partial N}\left\{\frac{f'(g_1)}{f'(g_2)}\right\} = \frac{1}{f'(g_2)^2}\left[f'(g_2)f''(g_1)\frac{\partial g_1}{\partial N} - f'(g_1)f''(g_2)\frac{\partial g_2}{\partial N}\right]$$

$$= -\frac{f'(g_1)}{f'(g_2)}K_1\left[\frac{\partial g_1}{\partial N} - \frac{\partial g_2}{\partial N}\right],$$

from (21), which implies the converse. Hence, $\partial B/\partial N > 0$. □

While the free rider problem tends to raise the level of expenditure in a chairman's district as N increases, the rising opportunity cost of taxation due to the increasing number of chairmen holding fixed their level of expenditure tends to lower it. Thus, the impact of changes in N on g_1 and g_2 is ambiguous. However, we can show that the per capita level of expenditure in the first period, $(N/I)g_1$, is increasing in N. The effect of changes in N on the second period per capita level of expenditure remains ambiguous.

To see this we make the following change of variables. If we let $\hat{g}_t = (N/I)g_t$ then (14) and (20) become

$$(27)\qquad x'(\hat{g}_2+\beta^{-1}B) = If'\left[\frac{I}{N}\,\hat{g}_2\right],$$

$$(28)\qquad x'(\hat{g}_1-B) = If'\left[\frac{I}{N}\,\hat{g}_1\right].$$

Differentiating (27) and (28) w.r.t N yields

$$(29)\qquad x''(\hat{g}_2+\beta^{-1}B)\left[\frac{\partial \hat{g}_2}{\partial N} + \beta^{-1}\,\frac{\partial B}{\partial N}\right] = If''\left[\frac{I}{N}\hat{g}_2\right]\left[\frac{I}{N}\,\frac{\partial \hat{g}_2}{\partial N} - \frac{I}{N^2}\,\hat{g}_2\right]$$

$$(30)\qquad x''(\hat{g}_1-B)\left[\frac{\partial \hat{g}_1}{\partial N} - \frac{\partial B}{\partial N}\right] = If''\left[\frac{I}{N}\,\hat{g}_1\right]\left[\frac{I}{N}\,\frac{\partial \hat{g}_1}{\partial N} - \frac{I}{N^2}\,\hat{g}_1\right].$$

From (30) and the result that $\partial B/\partial N > 0$, it follows that $\partial \hat{g}_1/\partial N > 0$. However, since increasing B tends to lower $\hat{g}_2$, the sign of $\partial \hat{g}_2/\partial N$ is undetermined. What is happening here is that the chairmen may find it increasingly in their collective interest to restrain second period spending by raising B.

Concluding Remarks

The model presented in this paper, while suggestive, does not model the political process by which representatives' preferences are mapped into outcomes in a satisfactory manner. While there exist separately explicit models of voting processes (such as in Chari and Cole (1993)), and models of committees (such as Austen-Smith (1992)), there are no explicit models which satisfactorily take account of both of these aspects of the political process. This is clearly an important topic for future research. We believe however that any more explicit model which appropriately incorporated the free rider problem that we have identified here, would have outcomes that were similar in character to ours.

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