

## Public Choice : (f) Bureaucracy

Voters and politicians are not the only people involved in choices of public expenditure. Senior administrators in government departments also play a role. Public sector employees may know better than elected politicians (or voters) how the departments work. In particular, the actual cost of providing a given quality of service in some department may be information that the employees know a lot better than anyone else. Public sector employees also play a major role in policy making : they take part in the process of deciding the budget for each department. If they do have this information advantage over elected officials, they may be able to influence the budgetary process to their own advantage.

One simple model of budget setting in the public sector is the theory of bureaucracy developed by William Niskanen. In Niskanen's model, senior government administrators ("bureaucrats") want their departments to have large budgets. In this model, they can use their role in the budget process, and their information advantage, to get bigger budgets than would otherwise be chosen.

In Niskanen's model, government departments will turn out to spend "too much". However, there will be no "wasteful" spending. Even though, in this model, bureaucrats are able to divert money from the public projects where the money is supposed to be spent, they will choose not to do so. So this is a model explaining excessive government, not corrupt government.

The reason why bureaucrats choose not to steal money in Niskanen's model stems from what he assumes is their goal. He assumes that bureaucrats are motivated by a desire for prestige, not by greed. If they benefitted personally from diversion of funds, then the results of the model would be different.

Mathematically, let  $Z$  be the level of services provided by some government department. This is the actual quality of the output that the department produces, quality that politicians and voters can observe. So if the department were in charge of highways,  $Z$  might be the number of miles of paved roads being supplied. If the department were in charge of education,  $Z$  might be some measure of students' performance on tests.

It is assumed that it costs money to provide a high level of quality of public output. The higher is  $Z$ , the more it will cost. So let  $C(Z)$  denote the actual total cost of providing a level of quality  $Z$  of public output. Since better quality costs more,

$$C'(Z) > 0$$

But it will also be assumed that the **marginal** cost of providing public output is an increasing function of the quality :

$$C''(Z) > 0$$

This cost function for the public sector is known by the bureaucrat, but not by the elected officials (or voters).

Let  $B$  denote the level of the department's budget.  $B$  is measured in dollars (per year). Niskanen's assumption about bureaucrats is that they crave prestige, and that the prestige of a

department is measured by the size of its budget. (Niskanen actually worked for some years in the U.S. defense department, presumably where he developed this theory.) So the crucial assumption in the model is

ASSUMPTION : The bureaucrat wants the budget  $B$  of her department as large as possible. The level of  $B$  is all she cares about.

In addition to her information advantage, the bureaucrat has some control over the agenda, in Niskanen's model. She gets to propose a budget. A budget consists of two items : a request for funds, and a proposed level of service which will be provided with those funds. So, in this model, the bureaucrat gets to propose  $B$  and  $Z$ . A budget proposal is any pair  $(B, Z)$  : an amount of money, and a level of service provision.

However, any proposed budget must be passed by the legislature. If the proposal  $(B, Z)$  does not appeal to the politicians, then the proposal will be rejected.

Having a budget rejected is bad for the bureaucrat. A strong assumption, made in Niskanen's most basic model, is that the department gets no money at all if the proposal  $(B, Z)$  is rejected. That means that the bureaucrat has a strong incentive to propose a budget which will be accepted by the politicians. She wants her budget as large as she can get it — subject to the budget proposal still being acceptable to the politicians.

What are the politicians' concerns? They derive some benefit from the output provided by the department. (This benefit may just reflect the voters' benefits : happy voters are more likely to re-elect the politicians.) The more service provided by the department, the higher is the benefit. So let  $V(Z)$  represent the **total** benefit, in dollars per year, from a quality of public output of  $Z$ . This total benefit is an increasing function of the level of quality of public output :

$$V'(Z) > 0$$

But it will be assumed that the **marginal** benefit of a quality improvement in the public sector is a decreasing function of the level of service provided :

$$V''(Z) < 0$$

If the politicians knew the true cost function  $C(Z)$  of providing public services, and if they could set whatever budget they wanted, then they would seek a level of public output quality  $Z$  to maximize the **net** benefit of the department : the total benefit of the services provided, minus the cost of providing them. So they would, if they could, seek to maximize

$$V(Z) - C(Z) \tag{1}$$

The level of public output  $Z$  which maximizes this net benefit, the efficient level of  $Z$ , will be denoted  $Z^*$ . Maximizing expression (1) with respect to  $Z$  yields the first-order condition

$$V'(Z^*) = C'(Z^*) \tag{2}$$

Not surprisingly, efficiency implies that the public sector should be expanded up to the point at which the marginal benefit of further service improvement just equals the marginal cost of the improvement. (The assumptions that  $V''(Z) < 0$  and  $C''(Z) > 0$  ensure that there is a unique solution to equation (2), which is a maximum and not a minimum.)

However, the politician is assumed not to know the true cost function for the public sector, and so does not know what is the efficient level  $Z^*$ , nor how much money should be spent in the department.

Nonetheless, the politician can observe the public service which does get provided. If the bureaucrat promises some level of quality, she must deliver on that promise. Promising some level  $Z$  of public output quality, and then not being able to provide it with the budget she has, will get her fired. So if she promises a level  $Z$  of output, she had better ask for at least enough money to provide that level. That means that her budget  $B$  must be large enough so that

$$B \geq C(Z) \tag{3}$$

(If  $B < C(Z)$ , then she will not be able to provide the promised service with the money requested, even if all the money is used for public output provision.)

She must also provide a proposal that the politicians want to approve. That means that the value of the benefits received are at least as large as the money provided.

$$V(Z) \geq B \tag{4}$$

(If  $B > V(Z)$ , then the value, in dollars, of the services provided by the department is less than the cost, so the politicians would find that they are better off without the department.)

Equations (3) and (4) are the two constraints faced by the bureaucrat : she can't promise what she cannot deliver, and she must provide benefits that are worth more than the costs.

So her problem is to provide a budget proposal  $(B, Z)$  which makes  $B$  as large as possible — subject to satisfying the constraints (3) and (4).

Constraint (3) implies that the proposal  $(B, Z)$  must be **above** or on the curve  $B = C(Z)$  (when  $Z$  is graphed on the horizontal,  $B$  on the vertical). That's the dotted green curve in Figure 8. Constraint (4) says that the proposal  $(B, Z)$  must be **below** or on the curve  $B = V(Z)$ . That's the solid red curve in Figure 8. So any proposal  $(B, Z)$  which is between the curves is feasible for the bureaucrat : she can deliver what she promised, and what she delivers is worth more than the budget requested.

So the bureaucrat will be able to divert funds if she wants. Every proposal which is above the curve  $B = C(Z)$  involves a budgetary request which is greater than the actual cost of providing the promised services. If  $B > C(Z)$ , there is some cost padding. Since the politicians do not know the true cost of the services provided, their ignorance can be exploited. (For example, the point (8, 240) in figure 8 is feasible, and provides benefits which are worth more than the requested budget. [In the figure  $V(8) = 256 > 200$ ], but involves more money than is actually needed

[ $C(8) = 192 < 240$ ]. The bureaucrat could get away with siphoning off 48 from the budget which is not needed.)

But the prestige-driven bureaucrat will choose not to pad the budget. She wants  $B$  to be as large as possible, subject to the constraints (3) and (4). That means, she wants a  $B$  as high as possible, subject to being between  $C(Z)$  and  $V(Z)$ . In figure 8 — and in general — that maximum comes at the point at which  $V(Z) = C(Z)$ . At that point, there is no diversion of funds. All the money requested is actually needed, since  $B = C(Z)$ .

Why is there no corruption here?

First of all, the bureaucrat will always want constraint (4) to hold with equality. If  $V(Z) > B$ , then she could increase the budget a little (which is what she wants), and still give enough surplus to the politicians that they are willing to approve. So she will always want to ask for such a high budget that the politicians are just on the margin of approval.

So she always want to get as much as she can from the politicians, which means  $B = V(Z)$ , which means a budget proposal right on the red curve in figure 8. Now suppose that there is some slack in the budget :  $B > C(Z)$ . That's money wasted, from the bureaucrat's point of view. Using the money instead to provide more services (increasing  $Z$ ) would increase the budget which politicians would be willing to provide. In other words, wasting money buys the bureaucrat nothing ; using the money to provide services can buy her a bigger budget. The biggest budget she can get is the cost of a level of services  $Z^m$  for which

$$V(Z^m) = C(Z^m) \tag{5}$$

of course,  $Z^m > Z^*$ . The bureaucrat's information advantage, and desire for prestige, lead to a larger public sector than is efficient.

In fact, from the politicians' and voters' point of view, the proposal chosen by bureaucrat is scarcely better than nothing at all. The value of the total benefits are equal to the budget (which equals the total cost).

How could the bureaucrat actually achieve this end? If the bureaucrat is the only one with the authority to propose a budget, then she can simply propose the budget-service combination she wants : a budget of  $C(Z^m)$  and a service level of  $Z^m$ .

But even if the politicians had a little more power, the bureaucrat could still use her superior knowledge of the technology. What if she told the politicians that the cost function  $C(Z)$  was the curve labelled "announced cost" in figure 9? Then, even if the politicians got to choose the budget themselves, they would pick a level of services such that  $V' = \tilde{C}'$ , where  $\tilde{C}(Z)$  is what they think is the total cost function. As figure 9 shows, the bureaucrat could lead them to think that  $Z^m$  was the efficient level of public service by lying about the cost function. And since  $\tilde{C}(Z^m)$  actually does equal  $C(Z^m)$ , no audit or investigation will ever detect any wrong-doing : the bureaucrat exaggerated the cost of providing levels of services which were not actually provided.

Of course the bureaucrat is playing a dangerous game here. She is leaving no surplus to the politicians, by selecting a budget and level of public output for which  $B = V(Z)$ . If that were

literally true, politicians would be indifferent between accepting and rejecting the budget. A slight miscalculation, and the bureaucrat is left with no budget at all.

So by (realistically) allowing for a little uncertainty, we might see a budget proposed which does offer a little net surplus to the politicians.

Realistically, we also might expect to see some slack in the budget :  $B > C(Z)$ . For one thing, the bureaucrat may be able to divert some funds for her own use : prestige may not be the only argument in her utility function. Even if she herself gets no enjoyment from budgetary waste, there are many employees in the department. Allowing a little extra in the budget may make many of the employees happier, enabling the bureaucrat to “buy” better performance from employees, by allowing a little budgetary waste. Finally, slack in the budget provides an insurance policy against future efforts by politicians to appear diligent. If some waste is built into today’s budget, then the bureaucrat can easily show her efficiency by reducing waste when asked to.