In Search of Optimum "Relative Unanimity"

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I.

In their classic work, *The Calculus of Consent,* Buchanan and Tullock (1962) deal with a number of critical public choice issues. One of the most basic of these issues is whether the decision-time costs associated with a rule of full unanimity are sufficiently high as to mandate the adoption of a 'relative unanimity' rule (a la Wicksell, 1896).

In his book, *The Demand and Supply of Public Goods,* Buchanan (1968: 95) observes what a rule of relative unanimity is meant to accomplish:

> ...so long as the individual knows in advance that his own vote, standing alone, cannot effectively block a proposal, he will not be motivated to exploit others for his own uniquely differential benefit. If a proposal is presented for a vote that embodies net benefits for him, he will tend to accept it, even if under a rule of full unanimity, he would be tempted to block the same issue. Under relative unanimity, it seems probable that a sufficient number of individuals would behave non-strategically to allow collective decisions on public goods to be reached.

The rule of relative unanimity has been criticized by a number of authors such as Fishkin (1979) and Rae (1975). Fishkin rejects rules of unanimity and near unanimity because such decision rules are likely to result in govern- mental inactions which impose "severe deprivations" or tyranny. "Severe deprivations that a regime fails to prevent can be as terrible as those it desires to impose" (Fishkin, 1979: 70). Put somewhat differently, Fishkin (1979: 69) asserts that "the government's failure to act may subject (a citizen) to the will of others ... whose actions the government fails to prevent.' Rae (1975) also rejects relative unanimity because 'we must surrender the right for other outcomes.' [1] These 'other outcomes' or foregone alternatives may be classified as (a) the set of decisions that might otherwise have been approved by a majority, and (b) the set of decisions that cannot be made because relative unanimity 'favors negative minorities over positive majorities' (Rae, 1975: 1273). The latter issue is consistent with the analysis in Fishkin (1979).

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We are not concerned here with the former because any decision that achieves consensus or relative unanimity necessarily would achieve a majority and would be deemed superior on efficiency grounds. However, we are concerned with the decisions that are sacrificed because 'negative minorities' may be able to block efficient decisions.

This paper formulates a simple mathematical framework for the selection of an “optimum relative unanimity” decision rule. The approach is first to identify the benefits of moving from a rule of simple majority towards a rule of full unanimity. Then, the costs of moving from simple majority rule towards unanimity are identified. Finally, the issue of an optimal decision rule is broached. This note seeks to help resolve the long-standing controversy/debate involving Buchanan and Tullock (1962), Fishkin (1979), Buchanan (1968), Rae (1975), Tullock (1975), Barry (1965) and others. The closing section of this note contrasts the present analysis with that originally presented by Buchanan and Tullock (1962).

II.

We assume a group of n individuals. The group is a voluntary association of persons brought together for the purpose of satisfying their common needs. Dictatorship within the group is not permitted. All votes (which must be either 'yes' or 'no') have equal weight. Majority rule is the minimum feasible decision rule. A ballot in which x persons vote 'yes' ($x < 1/2n$) and in which an equal number of persons x vote 'no' thus could not result in a decision.

In simple majority voting schemes, especially in the 'large numbers' case, the fundamental problem one encounters is that of the 'free rider,' who secures benefits of group action without sharing the costs thereof; here, decision- making tends to break down. Under a rule of unanimity, the same individual is thrust into a 'small numbers' case, and the 'free rider' problem effectively disappears. As Buchanan (1968: 97) observes, if a '. . . rule of unanimity should be applied . . . public goods will tend to be supplied efficiently.' Thus, on the one hand, a rule of unanimity (unqualified) tends to generate maximum benefits to the group in terms of efficiency in the provision of public goods. On the other hand, this same rule of unanimity -in practical terms -very likely '. . . would result in new, if any; decisions being made' (Buchanan, 1968: 94).

Thus, in moving from a rule of the simple majority towards various forms of relative unanimity and ultimately towards full unanimity, benefits accrue to the *group* in terms of increased efficiency in the provision of public goods. Such benefits reach a maximum at full unanimity (Buchanan, 1968: Ch. 5). One possible representation of these group benefits as the voting rule changes is shown in Figure 1 by the curve *GB,* which embraces the range of gross group benefits beyond simple majority. Observe that curve *GB* is at a minimum at the point of a simple majority rule, where, in terms of Figure 1, the 'free rider' problem is greatest.

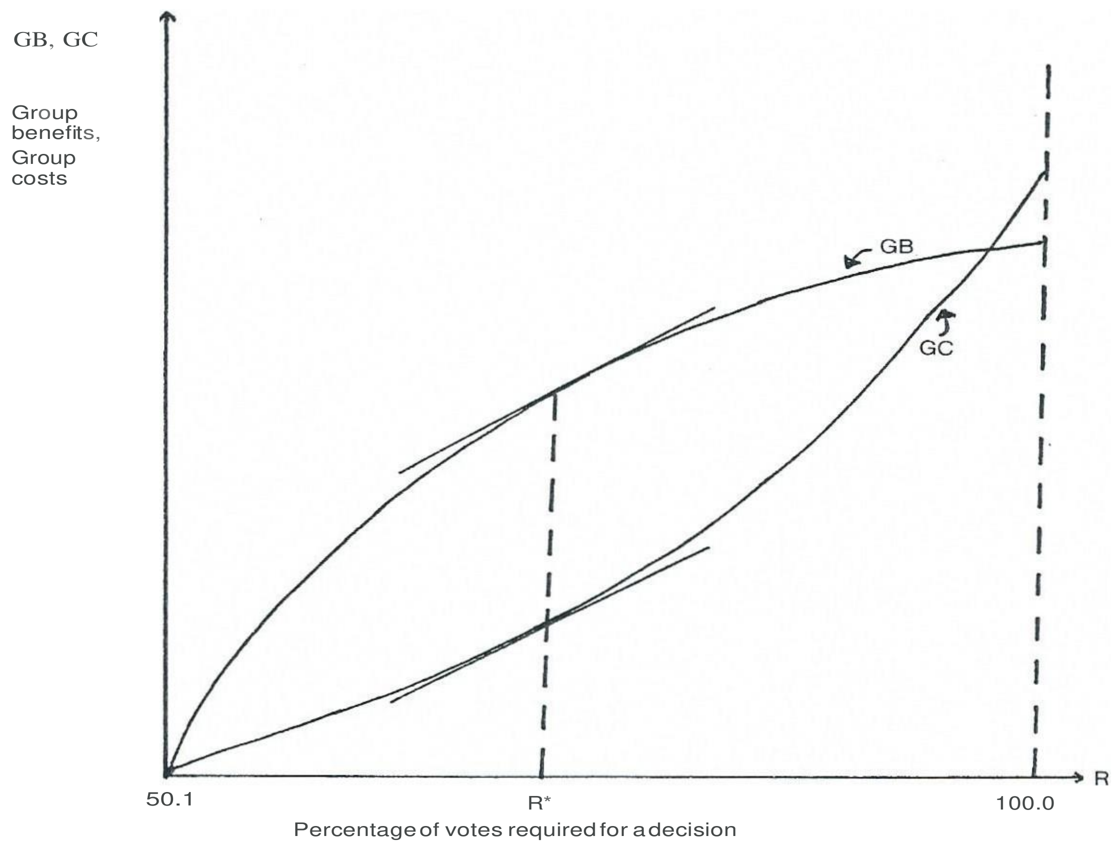

Figure J.

Note also that the curve reaches its maximum at the point of full unanimity, where the 'free rider' issue is dissolved.

In moving from a rule of simple majority towards a rule of full unanimity, there are increasing costs to the *group*. In particular, as the voting rule rises above that of a simple majority, the probability of decisions being made diminishes. In the extremum of unanimity, any single negative vote blocks a proposal; thus, the probability of incremental decisions being made is minimized under unanimity. Our interpretation here of 'group costs' is reasonably compatible with the analysis in Rae (1975) and Fishkin (1979) where it is argued that there are costs to the group from consensus or near consensus in terms of government inaction or in terms of the outcomes that the group 'must surrender.' Since the objective of the group is the collective satisfaction of needs common to all members of the group, a decreased probability of a group decision is an increased cost to the group. Hence, as the voting rule rises above that of simple majority towards that of unanimity, group costs rise. In terms of Figure 1, these costs rise as we move from simple majority in the direction of unanimity.

If group costs rise at an increasing rate as the voting rule rises above simple majority in the direction of unanimity, the costs to the group can be ted by a curve such as GC in Figure 1. Clearly, so long as group benefits and group costs are both measured in common terms, there exists a point of maximum *net* benefits from a voting scheme lying between the simple majority and unanimity – an *optimum* relative unanimity. This is represented in Figure 1 by R^*, where R^* represents that percentage of votes in excess of majority which maximizes net benefits to the *gr oup.*

Mathematically, so long as group costs and group benefits can be expressed in common terms, the group can be viewed as seeking to maximize:

$$N(R) = GB(R) - GC(R), \qquad 100.0 \geq R > 50.0 \qquad (1)$$

where R = the percentage of the group whose positive votes are necessary to a decision for the group;
N = net benefits from the various alternative values of R;
GB = group benefits (gross) for the various alternative values of R;
GC = group costs (gross) for the various alternative values of R.

For N to be a maximum, it is necessary that

$$N'(R) = GB'(R) - GC'(R) = 0 \qquad (2)$$

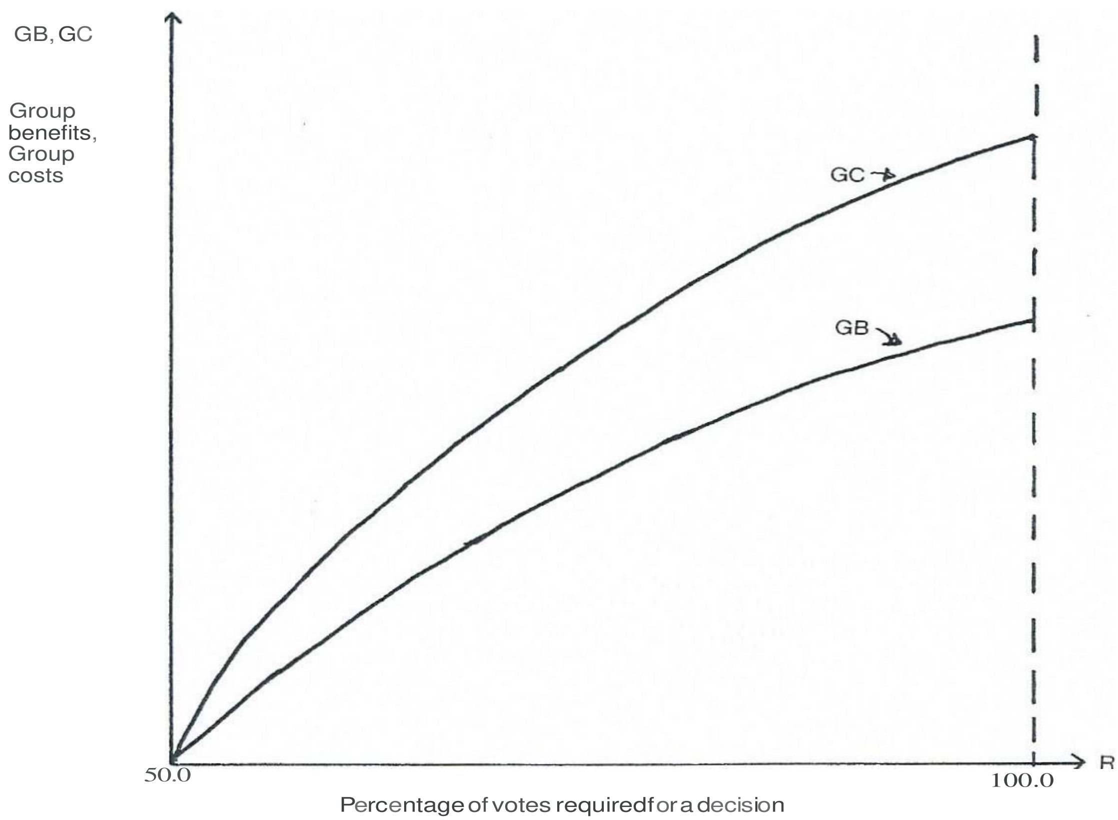

Figure 2.

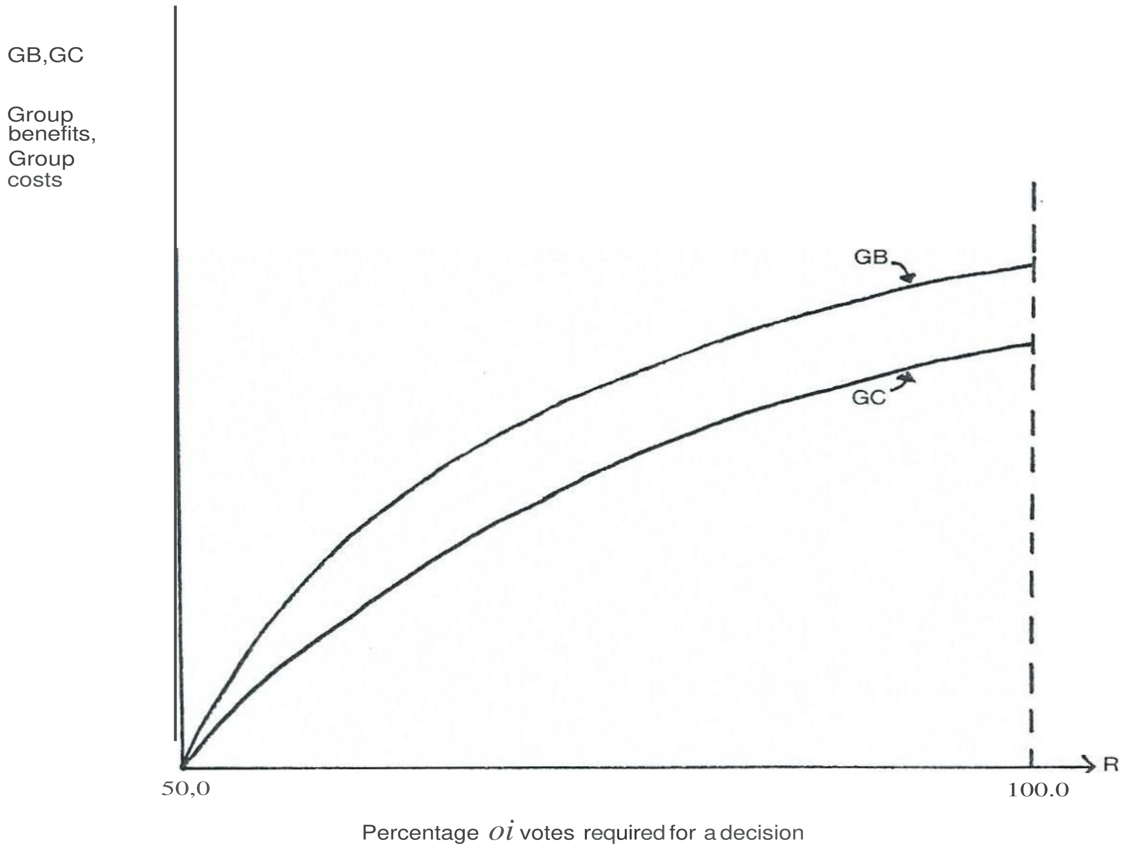

Figure 3.

or that

$$GB'(R) = GC'(R) \tag{3}$$

Equation (3) states that the slopes of the curves *GB* and *GC* in Figure 1 must be equal for group net benefits to be achieved. Such a situation is represented in Figure 1 at $R = R^*$ – at the optimum relative unanimity.

As shown in Figure 1, the slope of the *GC* curve is rising, i.e. $GC''(R) > 0$. It is Possible also that $GC''(R) < 0$. In the case where $GC'' = 0$, the optimum relative unanimity falls out in a very straightforward fashion, much as in Figure 1. This can be easily verified by the reader.

If the *GC* curve should rise at a decreasing rate, i.e., if $GC''(R) < 0$, then at least two interesting possibilities appear. On the one hand, such a *GC* curve might be everywhere steeper than the *GB* curve, as shown in Figure 2. In this type of case, the 'optimum' occurs at the point of simple majority, where the *negative* net benefits are minimized. This essentially is the case developed by Rae (1975) and is similar to the case in Fishkin (1979). If this particular representation is valid, then Rae's arguments rejecting unanimity are also valid. However, it is clear that Rae's arguments may be only a special case of the more general Buchanan-Tullock (1962) framework. On the other hand, the GC curve might be everywhere flatter than the *GB* curve, as illustrated in Figure 3. In this type of case, *N* is maximized at full unanimity. In this latter case, full unanimity is the optimal group solution, and it is unnecessary to resort to relative unanimity (Wicksell, 1896; Buchanan and Tullock, 1962 or to 'autocracy' as suggested in Rae, 1975: 1294). However, as was the situation in Figure 2, Figure 3 may also be only a special case.[2]

III

It may be arguable that the *GC* curve illustrated in Figure 1 is the most reasonable. This argument might be predicated upon the idea that, as the value of *R* rises above a simple majority rule, each individual in the group begins to recognize a growing individual power. This power is an increasing function of *R*. Thus, as *R* rises, the likelihood of a decision may decline at a faster and faster rate. If so, then $GC''(R) > 0$, and the optimum relative unanimity falls out readily, as in Figure 1.

In closing, we note that this analysis differs in several important respects from that in Buchanan and Tullock (1962). Relating this analysis to a some- what similar appearing one in Buchanan and Tullock (1962), we refer to their Figure 7 (p. 86). There are, of course, the obvious differences, such as (1) our use of *percentage* of the group required for a decision and Buchanan and Tullock's use of the *number* of persons required to agree, and (2) our use of simple majority as the minimum required for decision-making and Buchanan and Tullock's use of zero plus one as the minimum number required. More importantly, however , our analysis differs from theirs in its definition of the 'cost' schedule. Buchanan and Tullock's cost schedule is a 'decision-making' cost, i.e., it represents the expected cost to the individual of agreeing on a decision in terms of '. . . time and effort . . . which is required to secure agreements' (Buchanan and Tullock, 1962: 86). Costs as defined in the present paper are different. In this paper, they represent costs to the *group* in terms of a diminished probability of *any* decisions being made. Clearly, the notions are similar, but not identical. In addition, the present paper considers cases where costs do not rise at an increasing rate and provides a basis for viewing the Fishkin-Rae analysis as a special case. Finally, Buchanan and Tullock speak of a schedule of 'net' benefits to the *individual,* whereas the present paper speaks in terms of 'gross' benefits to the *group.*

NOTES

1. Rae (1975: 1273) maintains that 'the optimum among simple voting schemes is a majority rule ...' because 'majority decision minimizes the maximum number of voters who can possibly be dissatisfied.'
2. The difference between the higher GC curve in Figure 2 and that in Figure 1 represents the additional group 'costs' resulting from interpersonal comparison; i.e., the cost of the foregone redistributions envisioned by Fishkin (1979) and Rae (1975) as basic to the political process.

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