The Voting Paradox and The Possibility of A Social Welfare Function

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"All Politicians Exult to Make Deals."

INTRODUCTION

This paper offers the unorthodox argument that a majority voting rule will dominate a rule that requires unanimous agreement, even though under Condorcet's voting paradox (Condorcet, 1785) the majority rule yields no consistent ranking of alternatives. Nevertheless, under assumptions to be given, no voter will have an expected utility from majority voting which is below his expected utility outcome under the unanimity rule. Each will be better off with majority voting, if the change of rules makes any difference. In contrast to the usual view, the voting paradox does not destroy the attractiveness of majority voting, nor does it yield arbitrary outcomes.

In non-trivial cases, these conclusions which will be embodied in Propositions Four and Five below, are a consequence of the comparative efficiency of bargaining under the two rules, although they are also true when mutually beneficial negotiations are not possible. It is assumed that the expenses of bargaining are deducted from the surplus or other benefits available for distribution.

Each rule offers an incentive to negotiate reductions in disagreement. With a unanimity rule, bargaining is the path to compromise agreement. Bargaining in advance of majority voting can raise each participant's expected utility from the vote, either when the voting outcome is uncertain (and voters are risk averse) or when voting without prior negotiation would result in an inefficient mix of issue outcomes. Thus, negotiations will be more cost effective under the majority rule and the bargained outcome, conceived in terms of expected utilities from voting, can be viewed as a social welfare function.

The basic ideas can be illustrated with three voters and three legislators, who represent three different constituencies of a democratic organization, who are assumed to agree on procedures to resolve disputes and to abide by the outcomes, as long as they remain in the polity. Because the legislature is small, it is assumed that motions need not be seconded and that the mover may vote for a rival motion. Besides the legislature, the polity chooses a chairman, whose tasks are to set the voting agenda—the order in which legislators may make proposals (motions) to be voted on—and to enforce legislative decisions. The legislators themselves will determine the content of each motion. Each legislator will try to advance the interests of his constituency. Any decision can be made by unanimous agreement but, if each expects his constituency to benefit therefrom, a majority voting rule will be agreed on instead.

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Under majority voting, the power to set the agenda potentially gives the chairman
eccessous influence over the outcome. Let us say that agenda A dominates agenda B if every
legislator's expected utility from voting is at least as high under A as under B. Agenda A will
dominate the unanimity rule if every legislator's expected utility from voting under A is at least
as great as his expected utility outcome under the requirement of unanimous agreement. It is
reasonable to assume that in order to preserve their authority, legislators constrain the
chairman to set an agenda that satisfies two rules: (i) The agenda must be independent of
the content of any motion, unless there is unanimous agreement to allow a violation of this rule. (ii)
The agenda must be "fair," in the sense that the expected utility outcomes of voting do not depend
on the labelling of constituencies, unless this requirement yields an agenda that failed to
dominate the unanimity rule or that is, itself, dominated by another agenda. In this case, an
agenda must be drawn randomly from those which dominate the unanimity rule and are not,
themselves, dominated. Later discussion will show that there is always one agenda which
dominates the unanimity rule. "Fairness" means that if two legislators trade utility functions,
factor endowments, opportunity costs, and bargaining technologies, they must also exchange
expected utility outcomes of voting. It may be viewed as an extension of Nash's symmetry
axiom for bargaining outcomes (Nash, 1950) or of May's classic result (1952) for simple
majority rule.

When (i) and (ii) are met, the chairman's income will depend on the polity's surplus; he
may be removed from office by any legislator if he is unable to prove that these rules are
satisifed. In what follows, preliminaries are discussed before moving on to single- and
multiple-issue cases. In each case, the majority voting outcome will be compared with the
outcome that results when unanimous agreement is required. Throughout the paper, functions
will have continuous second-order derivatives, and \((i, j, k)\) will refer to any of the 3 constituencies
or to their representatives in the legislature.

**BARGAINING EQUILIBRIA**

Suppose the legislature chooses a formula to distribute an uncertain surplus of \(X - F(\theta; T)\), where \(\theta\) is a random variable with \(d\theta / d\theta > 0\), and \(T\) is time. \(\theta\) will vary between zero
and one and is subject to cumulative probability, \(G(T; \theta)\), on whose nature all legislators are
assumed, for simplicity, to agree (meaning that they calculate \(G\) in the same way from the same
data). Let \(X_k - Y_k(\theta; T)\) be the share of surplus allotted to constituency \(k\), for \(k = 1, 2, 3\), with
\(\Sigma X_k = X - F(\theta; T)\). The legislature's task is to choose a particular distribution formula, \(Y = (Y_1, Y_2, Y_3; T)\), where \(Y_k\) is the formula's contract life—or period during which it is certain not
to change—and each \(Y_k\) is calculated net of cumulative bargaining cost, \(B_k\), borne by \(k\) for
\((\theta, T)\), such that \(T > T_0\). Assume there to exist certainty-equivalent shares of surplus,
\(X_k(\theta; T; Y)\), for \(k = 1, 2, 3\), such that \(X_k\) is expected by everyone to be fair. Thus, the
polity may be thought of as choosing a distribution formula of infinite duration. Each
constituency will have an expected utility, \(U_k = U_k(Y_k)\), derived from a utility index, \(U_k\), which
is smoothly increasing and known to each legislator, for \(k = 1, 2, 3\). At \(T = 0\), we may
write, for any \(Y\):

\[
U_i = U_i(Y_i) = \int_0^1 \left( \int_{X_k} (X_k e^{-sX_kT(\theta)}) d\theta \right) dt,
\]

where \(q_i(T)\) is \(k\) 's rate of discount at \(T\), assumed to be the same for each \(k\).

If there are gains from co-operation among the polity's constituencies, it is potentially in
everyone's interest to keep the polity intact; the threat of separation may then be a useful
bargaining chip for any constituency, under either the majority or the unanimity rule. (Under
the unanimity rule, this must be true at \(T = 0\) when the polity forms, if it can not function
without a distribution formula.) For simplicity, and in keeping with the commitment to abide
by the outcomes of legislative decisions within the polity, it is assumed that other forms of
non-co-operation do not yield efficient threats under either rule, although allowing for them
would not basically alter the result.

Let \(U_{k0}\) be \(k\) 's worst possible outcome, an as well as its outcome if no bargaining takes place
(and no concessions are exchanged). Let \(\Delta\) be the set of all feasible \(U\); when bargaining costs
are set equal to zero and bargaining constrains are ignored. Let \(A\) be the set of feasible,
certainty-equivalent \(Y\) that can be reached via bargaining, with \(k\) 's bargaining cost deducted
from \(Y_k\) for each \(k\). \(A\) will be a subset of \(\Delta\). Moreover, the size and shape of \(A\) will depend on whether the polity adopts the unanimity or the majority voting
rule, and under the latter, on how rights to make motions are determined. Let \(U(Y) = (U_1(Y), U_2(Y), U_3(Y))\); let \(U(A)\) be the set of all \((U)\) such that \(Y = A\), and define \(U(A)\) in the same way. \(U(A)\) is assumed to be compact and convex, while \(U(A)\) is assumed
compact, but not necessarily convex, owing to positive bargaining costs. (This question is taken
up in the mathematical appendix.) Finally, let \(U_{k0}\) be \(k\) 's best possible bargaining outcome—
which \(i\) also take to be his outcome if he bargains, but \(j\) does not, for \(i \neq j = k\)—and let
\(U_k = U_k (A)\) be the expected outcome of bargaining.

Then, axioms 1–4 below will govern expected bargaining outcomes, given that each
legislator maximizes the expected utility of his constituency. Axioms two and four will be
proved below (Propositions Three and Two, respectively), while axioms one and three are
assumed. Together, they yield the Kalai-Smorodinsky (1975) bargaining solution (See also
Nash (1950) and Luce and Raiffa (1957, pp. 349–50)).

1. **Invariance**: For given \(A\), \(U\) is uniquely defined, and \(Y\) does not change when any
gle legislator's utility index is transformed to \(s \cdot U_{k0}\), with \(s > 0\).

2. **Monotonicity**: Suppose \(U(A)\) expands, with \(U_{k0} < U_{k1} < U_{k2}\), and hence \(U_{k0}\) expanded,
in such a way that, for any given payoffs, \(U_{k0} \leq U_{k1} < U_{k2}\), the maximum \(U_{k0}\) in \(U(A)\) increases, for some
\(k = 1, 2, 3\) and \(i \neq j \neq k\). Then, \(U\) increases as well.

3. **Symmetry**: Suppose \(U_{k0} = U_{k1} = U_{k2}\). Then, if \(U(A)\) is symmetric in all 3 utilities,
\(U_k = U_{k0} = U_{k1}\).

4. **Limited Pareto Optimality**: The bargaining outcome is Pareto optimal within the set
\(U(A)\).

A straightforward generalization of the Kalai-Smorodinsky arguments shows that \(U\) is
the intersection of the Pareto frontier of \(U(A)\) with the straight line between \((U_{k0}, U_{k0}, U_{k0})\)
and \((U_{k1}, U_{k1}, U_{k1})\). In the next few sections, we shall investigate the choice of a distribution
formula under the assumption that there is no status quo rule which requires a new formula to
defeat an existing one in head-to-head voting. The problem created by such a rule will then be
taken up.

**THE VALUE OF THE FINAL-MOTION RIGHT**

In light of axiom one, fix the origin and scale of each utility index. Let \(U_{k0}\) be \(k\) 's expected
utility, should it separate from the polity. In \(U(A)\), let \(U_{k0} = \max_{U_k} U_k\) such that \(U_k \neq U_i\) and
\(U_k \neq U_j\) for \(i, j \neq k\). If any \(i\) separates, the polity consisting of \(3\) constituencies will no longer exist,
and each constituency will revert to its \(U_{k0}\) for \(k = 1, 2, 3\), which takes into account all
possibilities of forming policies consisting of two constituencies only. If the policy is viable, \( U_j \geq U_k \) for each \( k \), and I shall focus on the non-trivial case in which the strict inequality holds for each constituency. \( U_j \) is also k's worst possible outcome, under the unanimity rule, as well as his "disagreement solution" (although only the former interpretation is necessary to prove the Kalai-Smorodinsky theorem).

Suppose i and j do not bargain. Nevertheless, if k offers \( U_i \) and \( U_j \) to i and j, respectively, each has nothing to lose by separating, and k would have to make small concessions to each to optimally blunt their perceived separation threats. As a result, if \( U_j \) is k's best possible bargaining outcome, under the unanimity rule, \( (U_j - U_k) > 0 \), although I shall follow convention in assuming that the difference is small enough to ignores. Under the unanimity rule, the bargaining outcome would lie along the straight line from \((U_i, U_j, U_k)\) to \((U_{ij}, U_j, U_k)\) to \((U_{ij}, U_{ij}, U_k)\) to \((U_{ij}, U_{ij}, U_{ij})\). Next, suppose the majority rule applies. Given a voting paradox, along with rule (i) in the introduction and expected utility maximization by each legislator, the valuable right to make the final motion to be voted on. To illustrate, suppose each legislator is allowed to propose one distribution formula, and let the legislator be numbered by the order in which they make their motions. The distribution proposed by the first legislator is picked against that moved by the second, and the winner goes against the formula proposed by the third. If a legislator passes when his turn comes or proposes a non-feasible outcome, he loses his right to make a motion. For the moment, assume neither of the first two legislators bargains with the third. Then, the outcome of voting will differ only marginally from \((U_i, U_j, U_k)\). By itself, majority voting gives minimal protection to legislators one and two. Whoever moves last takes most of the gains from cooperation.

To see why this is the case let \( Y^0 \) be the vector of proposals of one and two, and for any \( Y \), let \( M(Y) \) be the set of distribution formulae which a majority prefers to \( Y \). Then, \( M(Y) \) is not empty, for any \( Y \). Moreover, legislator three will not vote for \( Y^0 \) unless max. \( U_j \) achievable from the closure of \( M(Y^0) \) = \( U_j \) from the closure of \( M(Y^0) \). Thus, if one proposes \( Y \), such that \( U_i(Y) > U_k \), two will capture three's vote with a proposal yielding a lower \( U_j \) (but one still higher than \( U_k \)), along with the same \( U_j \) as proposed by one. When three then makes his winning proposal, one will get \( U_k \), two will do marginally better than with the proposals of one and two, and three will take the rest. Thus, one can do no better than to propose \( U_i \), which forces two to propose \( U_j \), with each hoping that three will throw the marginal sacrifice required to win the vote his way. I assume this sacrifice does not reduce \( U_k \), and that the same would be true if either of the other legislators had the right to make the final motion.

Next, suppose legislators one and two try to form a coalition against three. Since each legislator votes to maximize his expected payoff, three can still win with a proposal that makes one or two better off than with its coalition payoff and returns the other to its opportunity cost, making sure the party to receive the harsh treatment knows this before voting begins. Thus, a coalition against three will not form since it will marginally reduce the expected utility of either one or two. More generally, with a Condorcet paradox, any two-party coalition is dominated by another which includes the previously-eliminated constituency. Let us assume that no pair of constituencies enjoys stronger bonds of loyalty or trust or better communications than exist between any other pair, and on these grounds, that the cost of forming any two-party coalition is independent of the identities of its members. Suppose that i and j initially try to form a coalition against k, for any \( i \neq j \neq k \). The required investment can only pay off if the coalition incurs a greater cost on k than k's own cost of forming a dominating coalition. Consequently, if coalitions are costly, no party will expect to gain from an initial investment in coalition formation. Indeed, he will expect to lose that investment, and coalitions will not form. If coalitions were costless, they could inflict no damage on the excluded party.

**EXPECTED UTILITIES FROM MAJORITY VOTING**

With the above in mind, fix the numbering of the constituencies and let \( U_k \) be k's expected utility from majority voting at any point in the prior bargaining, should voting take place immediately, for \( k = (1, 2, 3) \). Let \( U_k^0 \) be the expected utility value of k's offer to k, which is again calculated net of cumulative bargaining cost borne by k. Within a small increment, \( U_k \) will be k's voting outcome if negotiations end and voting takes place immediately, and if \( j \) has the final-motions right. In this context, let \( P \) be the probability that j will make the final proposal to be voted on, and let \( P = (P_j, P_k) \). By rule (i), P is independent of any legislator's motion. Finally, let \( U_k(0) \) be k's expected utility from majority voting if there is no prior bargaining, as well as his worst possible bargaining outcome. From the previous section, \( U_k^0(0) - U_k(0) \) if \( k \neq 1 \), and \( U_k^0(0) - U_k(0) \) if \( k = 1 \). Rule (i) and the discussion of the preceding section therefore imply Proposition One.

**Proposition One:** \( U_k(0) \) is given by the first line of equations (1) below, and \( U_k(0) \) is also given by the second line:

\[
U_k = \sum_i P_i U_k^0
\]

\[
U_k(0) = U_j + P_i (U_{ij} - U_k)
\]

for \( k = (1, 2, 3) \).

Since the bargaining outcome will depend on P, rule (ii) does not allow us to set (\( P_j \), \( P_k \)) arbitrarily. Instead, we must choose from the set of \( P \) which dominates the unanimity rule, assuming this set is non-empty. Proposition One omits a procedural assumption: rule (iii) Voting on a distribution formula takes place after a majority of legislators have voted for closure, at which point bargaining ends, a drawing is held to allots the final-motions right, and voting occurs. However, if unanimous agreement is reached prior to voting, this pre-empts the necessity of a vote.

Finally, suppose legislators k and i trade concessions during bargaining, causing \( U_k \) to rise by \( \Delta U_k \) and \( U_i \) to rise by \( \Delta U_i \). From (1):

\[
\Delta U_k^0 = \frac{\Delta U_k}{P_j} - \frac{\Delta U_i}{P_i}
\]

if \( P_i > 0 \),

where \( \Delta U_k^0 \) is k's concession to i, and \( \Delta U_i^0 \) is the decrease in \( U_i^0 \) caused by i's concession to k. \( \Delta U_k^0/\Delta U_i^0 \) is the portion of \( \Delta U_k^0 \) which goes to increase \( U_k \). With this in mind, let \( U_k(0) \) be k's best possible bargaining outcome, given \( U_i(0) \) and \( U_j(0) \). In (A), let \( U_k(0) \) be maximum \( U_k \) such that \( U_k - U_i(0) \), \( U_k - U_j(0) \), for \( k = (1, 2, 3) \) and \( i \neq j \). Suppose i and j do not bargain. Nevertheless, if k offers \( U_k(0) \) to i and \( U_k(0) \) to j, the two can not lose by voting for closure and forcing k to accept \( U_k(0) \). Thus, if \( U_k(0) \), k will make a concession to one of the others—say, to—which brings \( U_k \), \( U_k(0) \), \( U_k \), \( \Delta U_k \), and sets \( U_k \), \( U_k \), \( U_k \), \( \Delta U_k \), for some \( \Delta U \), while \( i \) accepts \( U_k \). Let \( \Delta U_k^0 \) denote k's concession to i. Because i does not bargain, k will perceive a small \( \Delta U_k \), relative to i's share in an equal division of \( (U_k - U_i(0)) \), as being necessary to optimally blunt i's threat to call the question without accepting k's offer. That is, after making linear transformations of \( U_k \) and \( U_i \) to set \( U_k = U_i = -\Delta U_k \)
1, and \( U_k(0) = U_k(0) = 0 \). \( 3A U_k \) will be small. However, since we are determining reference points for the expected bargaining solution, we must calculate \( A U_k \) as indicated above, which implies that \( \Delta U_k \) will be of the same order of magnitude as \( A U_k \). Accordingly, the difference, \( U_k - U_k \), is assumed to be small enough to ignore, if and only if \( P_k \geq \delta_k \).

To summarize, equations (2) will relate to \( U_k \) for \( k = (1, 2, 3) \):

\[
(2) \quad (U_k - U_k(0)) = s_k(P_k) (U_k - U_k(0)).
\]

Here \( s_k \) is a non-decreasing function of \( P_k \), with \( 0 \leq s_k \leq 1 \), and \( s_k(0) = 1 \).

BARGAINING OUTCOMES IN THE SINGLE-ISSUE CASE

In the next two sections, \( U_k \) will denote \( k \)'s expected utility from majority voting, calculated as in the first line of equations (1), \( U_k(0) \) and \( U_k \), given by (1) and (2), will be \( k \)'s worst and best possible bargaining outcomes under the majority rule, and \( U_k \) will denote \( k \)'s expected bargaining outcome before negotiations begin, for \( k = (1, 2, 3) \). Under the unanimity rule, \( U_k \) and \( U_k \) will be \( k \)'s worst and best possible outcomes, and \( U_k \) will denote his expected outcome. When there is just one issue to decide, majority voting allows negotiations to start at high-threat points than does the unanimity rule and to end short of complete agreement. This is the source of its potential cost advantage. (A) and (B) below give basic assumptions about voting and bargaining under the majority rule. Axioms one and three, along with (B), will also apply to bargaining under the unanimity rule:

\[ (A) \text{ Rules (i) and (iii) hold, as well as axioms one and three (with the proviso in footnote one). Proposition Four below will show the existence of a } P = (P_1, P_2, P_3) \text{ which dominates the unanimity rule, and application of rule (iii), in the name of expected-utility maximization, will then ensure that a dominating } P \text{ is chosen. In general, we can not insist on the "fairness" condition of rule (ii) in the single-issue case, which would imply } P = (y_1, y_2, y_3). \]

For given functions, \( F(\theta; T) = \chi \) and \( G(T; P) \) changes in \( P_1, P_2, P_3 \) and in opportunity costs, \( U_k, U_k, U_k \), will alter the set of possible bargaining outcomes. Two assumptions are made about the effects of such changes on each \( U_k \). First, each \( U_k \) will be an increasing function of \( U_k(0) \) and a decreasing function of \( U_k(0) \), for each \( i \neq k \). A rise in \( U_k(0) \) is a substitute for expected utility gains that \( k \) would otherwise have to obtain by making concessions and expending bargaining resources. Second, for the same reason, no change that increases \( U_k(0) \), for one or more values of \( k \), should cause a purely inward shift of the Pareto frontier of possible bargaining outcomes. Thus, if such a change causes \( U_k \) to fall, for some; it will also cause \( U_k \) to rise, for some constituency whose \( U_k(0) \) has risen.

(B) Given \( P \), along with each \( U_k, U_k \), suppose all legislatures use bargaining strategies that are mutually optimal against each other. Then, \( k \)'s expected bargaining outcome can be written more generally as \( U_k(B_k, B_k, B_k) \), where \( B_k \) is \( k \)'s total bargaining cost, for \( k = (1, 2, 3) \). Assume that the random component in each bargaining outcome is independent of \( B_k(B_k, B_k, B_k) \) and, consequently, that \( k \) increases \( B_k \) if and only if this leads to a higher \( U_k \). Each \( B_k \) will then select \( B_k \), the smallest \( B_k \) consistent with maximizing \( U_k(B_k, B_k, B_k) \). When each \( B_k \) is \( B_k \), we have:

\[
(3) \quad \frac{dU_k}{dB_k} = 0, \quad \frac{dU_k}{dB_k} = 0, \quad \text{for } k = (1, 2, 3),
\]

and \( U_k \), \( U_k \), \( U_k \). From (4) and Proposition Two below, \( U_k(0), U_k, U_k \) is the only point which maximizes \( 2 \) over the Pareto frontier of possible bargaining outcomes. It is also straightforward to show that \( dV_k/dB_k = 0 \), when \( B_k \) is sufficiently large. This guarantees that \( V_k \) will exist, although expected exchanges of concessions will only occur if they ultimately recoup each party's bargaining cost.

Each legislator is assumed to adjust his own bargaining input quickly to any changes in input by the other legislators. In this context, (4) will apply to alternative values of the vector, \( (B_1, B_2, B_3), \) and, correspondingly, if the functions, \( V_k(B_k, B_k, B_k) \), within the set, \( U(A_k) \), of all possible bargaining outcomes under majority voting. Let \( V_k = \frac{dV_k}{dB_k} \), for \( k = (1, 2, 3) \), and \( dA_k = \frac{dV_k}{dB_k} - V_k \), where \( dV_k/dB_k \) is the total derivative of \( V_k \) with respect to \( B_k \). Then (4) are assumed for each \( k = (1, 2, 3) \), with \( i \neq k = \)

\[
(4) \quad \frac{dV_k}{dB_k} = 0, \quad \text{sign } dA_k = \text{sign } dA_k - \text{sign } V_k.
\]

In the above, (a) posits an absence of "free-rider" effects when any constituency increases its bargaining input, while (b) and (c) assume that increases in bargaining inputs by two or more legislators are, to a degree, offsetting (as would be implied, e.g., by equal access to bargaining technology and skill). More precise rationalizations of (a) were (c): A higher \( B_k \) for given \( B_1, B_2 \), would improve or at least not worsen k's terms of trade in bargaining with \( i \) and \( j \). It might also increase the rate of exchange of concessions, but k is assumed to capture any gains from this. (b) Provided \( V_k = 0 \), a higher \( B_k \) would be more unfavorable to \( i \); if I could not adjust \( B_1 \) in response, and the offsetting response would be to increase \( B_k \). A higher \( B_k \) would have a more positive effect on \( V_k \), if \( B_k \) and \( B_1 \) were not adjusted in response, but \( dA_k = 0 \) if the intensification of \( B_k \) does not affect \( V_k \) or \( V_k \). (c) is also assumed for larger-than-marginal changes in \( B_k \). If such changes do not affect \( V_k \) or \( V_k \), for unchanged \( B_k \) and \( B_1 \), they will elicit no offsetting changes in \( B_k \) or \( B_1 \).

Proposition Two: The point \( U_k = (U_k, U_k, U_k) \), where \( U_k = V_k(B_k, B_k, B_k) \), for \( k = (1, 2, 3) \), is Pareto optimal in \( U(A_k) \).

Proof: Suppose there is a point, \( U_k = (U_k, U_k, U_k) \), with \( U_k > U_k \), \( U_k > U_k \), \( U_k > U_k \), for \( k = (1, 2, 3) \). It will be shown that \( B_k > B_k \), for each \( k = (1, 2, 3) \). This proves the Proposition, since no legislator will increase his \( B_k \) above \( B_k \) unless at least one legislator expects to gain thereby. Thus, if \( B_k > B_k \), for \( k = (1, 2, 3) \), we can imply that \( U_k > U_k \), without reducing the expectation of \( U_k \) below \( U_k \), for \( i = (1, 2, 3) \). In consequence, the expectation of \( U_k \) would be no less than \( U_k \), contradicting the selection of \( B_k \). Therefore, \( B_1 > B_1 \) and restrict \( B_k < B_k \). Such a restriction would cause \( i \) to set \( B_k = B_k \), for \( i = (2, 3) \), and \( B_k < B_k \) will change the expectation of \( U_k \), below \( U_k \). Again from (4), we see then that \( B_k > B_k \), \( B_k > B_k \) cannot both hold. Thus, suppose \( B_k > B_k \), for \( i = (1, 2) \). By restricting each \( B_k \) to \( B_k \), we similarly see that \( B_k > B_k \), must hold.

Proposition Three: Under majority voting, the expected bargaining outcome obeys axiom 2, the monotonicity axiom, with \( U_k(0) \), replacing \( U_k \), and replacing \( U_k \).

Proof: Points of \( U(A_k) \) other than \( U_k \), can be turned into expected bargaining outcomes by suitably restricting the bargaining input of at least one constituency and/or the set of allowable distribution function and/or by forcing one or more constituencies to waste bargaining input. Suppose \( U(A_k) \) expands as indicated in axiom 2. Let \( U(A_k), U(A_k), U(A_k) \), denote the expected bargaining sets and k's expected bargaining outcomes before and after expansion. For every point, \( U_k, U_k, U_k \), \( U_k = (U_k - \Delta U_k) \), for \( \Delta U_k > 0 \), in \( U(A_k) \). As a result, a tax on k's certainty-equivalent share of
surplus can be designed that always takes part of the difference between k's ex post bargaining outcome and \( U_0(0) \), with the tax share varying as a function of the ex post bargaining solution in such a way as to shrink the set of feasible outcomes, net of the tax, back to \( U(A) \). This will reproduce the expected solution, \( U(A_0), U(A_1), U(A_2) \), that prevailed before the expansion of \( U(A_2) \).

If such a tax is then withdrawn, k can achieve an effect on \( U(A) \), identical to that of the tax, by making a binding pledge in advance of negotiations to purchase additional bargaining solutions, beyond that mandated by (3), and to waste it—i.e., to use it in a way such that \( V_k = 0 \), for \( i = k \) and \( V_k = 0 \). (Recall that \( U_k \) is calculated net of \( B_i \).) Such a pledge would detail the amount of \( B_i \) to be wasted, again as a function of the ex post bargaining solution. For details of this bargaining solution, loss of \( u_k \) due to wastage would match the loss of every possible ex post bargaining solution, loss of \( u_k \) due to wastage would match the loss of every possible ex post bargaining solution. The above discussion can readily be adapted to bargaining under the unanimity rule, by replacing \( U_i(0) \) with \( U_i(2) \), for \( k = (1, 2, 3) \), in (3) and (4), Propositions Two and Three again hold, leading to Proposition Four.

**Proposition Four:** Let \( U_i(2) = U_0(2), U_2(2), U_3(2) \) be the expected bargaining outcome under majority voting and \( U^*(i) = (U_1(2), U_2(2), U_3(2)) \) be the expected outcome under the constraint of unanimous agreement. Then, for some \( P, U_i(P) > U_1 \), for each \( k = (1, 2, 3) \), if there is no status quo rule requiring a new forum to define an existing one head-to-head voting. The strict inequality holds for one coalition, it can be made to hold for all. The proof of \( U^* \) lies on the straight line from \( U_1(0), U_2(0), U_3(0) \) to \( U_1(2), U_2(2), U_3(2) \), while \( U_i \) lies on the line from \( U_i(0), U_i(0), U_i(0) \) to \( U_i(2), U_i(2), U_i(2) \). Make linear transformations to set each \( U_1 = 0, U_2 = 1, U_3 = U_2 = U_2 \). When \( U_i = \text{reached}, U_1 = 1, U_2 = U_2 = U_2 \). If \( P_i > 0 \), and in some \( (P_i > 0) \), then there is a such that \( U_i > U_1 \). Such \( P_i > 0 \), and in some \( (P_i > 0) \), there is a such that \( U_i > U_1 \). Using the intermediate value theorem, we can find \( P_i, P_1, U_i = U_i \), for each \( U_2 = 1 \). This common value must exceed \( U_i, and, thus, each \( U_i \). Next, raise \( P_i, while maintaining \( U_2 = U_2 \). (The procedure for doing this is given in the mathematical appendix.) Before \( P_i \) is zero, we must arrive at a \( P_i \) which equals each \( U_i \), and the Proposition is therefore true. Moreover, Suppose the majority voting rule makes a difference. Then, \( U_i(P_i) = U_i(0) \), for some \( i \). And \( U_2 \) and \( U_3 \) have the following the same.

**Lemma:** The fairness criterion of rule (ii) is met if \( P_i = P_j = P_k \), and if \( k = (1, 2, 3) \). In general, three conditions are also necessary. “Fairness” will hold if \( P_i = P_j = P_k \), for \( i = 1, 2, 3 \), or if \( \phi_i = \phi_j = \phi_k \), and, perhaps, in other cases. To ensure fairness, assume rule (iii). The polity adopts a set of formal-motion-right probabilities that is “fair,” not dominated by any other set, and which dominates the unanimity rule. If the polity decides to vote separately on each issue, Proposition Five below says that exactly one such set will always exist.

**D:** Bargaining outcomes generated by different sets of formal-motion-right probabilities are assumed to be distinct. Each \( U(0), U(1), U(2), \) and \( U(2) \), will be a decreasing function of \( m \), the number of possible outcomes of drawings to allocate formal-motion rights. The greater is \( m \), the more complicated is bargaining. Economic tools, in terms of the computation of optimal offers and responses, and the number of consequences of exchanges of concessions, required to achieve given gains in expected utilities, gross of bargaining costs. This lowers the productivity of bargaining inputs. (2) For given \( m \), the assumptions in the second paragraph of (A) will again relate changes in \( U_i \) to changes in
(U_0(0), U_0(0), U_0(0)). We also recall that each U_0 is assumed to be a smooth function of the vector of all final-motion-right probabilities. Finally, the policy will minimize the number of issues voted on separately, for any given expected-utility outcomes of bargaining.

Proposition Five: Only two methods of assigning final-motion rights can satisfy rule (ii). In alternative I, m = 1. The allocation of final-motion rights is non-random. Each legislator receives the right to make the last motion of a definite, “decisive” issue. In alternative II, m = 3, and each P_i = \frac{1}{3}. All 3 final-motion rights are allocated as a bundle. Moreover, I and II can not both be dominated by any other set of final-motion-right probabilities, and I dominates the unanimity rule, if (i) also hold then. If the policy does vote separately on each issue, it will adopt I.

Proof: Let T = 0, and suppose there is a set of final-motion-right probabilities, Q, other than I or II, which satisfies rule (iia). When Q prevails, let U_Q(P; Q) be the value of U_0(Q0) and U_Q(0) be k's expected bargaining outcome. If such a Q is not clearly dominated by alternative I, m = 2, and each P_i > 0. For any P = (P_1, P_2, P_3), such that \Sigma P_i = 1, define U_Q(P; P) and U_Q(P) in the same way. For such a P, m = 3.

Let Q be the vector with one in the kth position and zeroes elsewhere. Clearly, U_Q(0) > U_Q(P), for each k. Make linear transformations of each underlying utility to set each U_Q(0) = 1. We can then use (iib) plus the intermediate value theorem to find a P such that U_Q(P) > 1, for each k, contradicting the efficiency of Q. Such a procedure is described in the mathematical appendix.) Let U_Q(I) and U_Q(II) denote k's expected bargaining outcomes under alternatives I and II, respectively. Let U_Q(N) be k's expected outcome under any other set, V, of final-motion-right probabilities. If U_Q(V) > U_Q(II), for each k, we must have m = 2 when N holds, and for at least one k, it is hard to check that U_Q(V) = U_Q(I).

Let II denote the alternative of voting on all issues combined when each P_i = \frac{1}{3}. Then, the above assumptions imply that each U_Q(I) > U_Q(II), when T = 0, and also at any T > 0. Provided the policy does not adopt a rule requiring new formulae to defeat status quo rivals in head-to-head voting. However, if issues are voted on separately, such a status quo rule will tend to lower each U_Q(0; P_i) for all P with positive components such that \Sigma P_i = 1, since it will reduce the gain from drawing the final-motion rights, without reducing the possibility of failing to draw them. This defeats the purpose of a status quo rule, and the policy would not combine it with II.

At T = 0, U_Q(I) = U^*_Q, for each k, where U^*_Q is again k's expected-utility outcome of bargaining, under the constraint of unanimous agreement. The proof of Proposition Four is easily adapted to show, this since both U_Q(I) and U^*_Q lie on the straight line from (U_0, U_0, U_0) to (U_1, U_2, U_3). Under alternative I, the advantage of majority voting is that it makes available a simple bargaining procedure in which each legislator concides on the issue for which he holds the final-motion-right, and such concensions are exchanged. A unanimity requirement forces each negotiator to concede on every issue. Bargaining becomes more complex and costly, to everyone's loss.

Suppose the policy chooses alternative I. Then, whenever an issue re-appears on the voting agenda, at some T = 0, “fairness” will require that any other constiency also have the option of placing its issue on the agenda, to protect its relative bargaining strength. Thus, U_Q(I) > U^*_Q, for each k, at any T > 0, if there is no rule to protect the status quo. From the perspective of T = 0, such a rule will protect each constiency from future loss of bargaining strength. This protection will be greater, the larger the percentage of votes for an alternative that is necessary to defeat a status quo formula.

Suppose that status quo formulae prevail under the unanimity rule until replacements are chosen. As an alternative, the policy can combine the protection of the unanimity rule with majority voting on the issues, by allowing each constituency to substitute its status quo share for any offer made it during voting. Suppose this is done, and let U_k be k's expected utility at any T > 0, if the existing distribution formulae are renewed. So defined U_k > U_0. We may then apply most of our discussion of bargaining above to bargaining at any T > 0, if we substitute U_k for U_0. Propositions Four and Five would continue to hold. Since this treatment of the status quo is always an option under majority voting, we again conclude that the majority rule dominates the unanimity rule, and that if the policy decides to vote separately on each of 3 decisive issues, it will choose alternative I.

DIGI

THE BARGAINING OUTCOME AS A SOCIAL WELFARE FUNCTION

To ease the notation below, let U_0 now replace U^*_Q as k's expected bargaining outcome, and let U_1 be the underlying utility index from which U_0 is calculated. Under the majority rule, bargaining leads to an efficient outcome and therefore maximizes a function, say H(U_0, U_1, U_2), increasing in each U_i.

Proposition Six: Bargaining maximizes a social welfare function of the form, \Sigma w_i U_i, where each w_i > 0 is independent of \theta and T.

Proof: Using the mean-value theorem, we can write H(U_0, U_1, U_2) = \Sigma w_i U_i. Since the parameters of H are independent of \theta and T, the same holds true for H. Moreover, from the calculus of variations (Egoloski, 1962, Ch. 1-IV), it is clear that maximization of \Sigma w_i U_i requires maximization of \Sigma w_i U_0, at each \theta and T.

Suppose there is an internal maximum. Then, in the single-issue case, the first-order conditions for either maximization require \Sigma w_i U_1 = \Sigma w_i U_2 = \Sigma w_i U_3 at each \theta and T, where \Sigma U_0 = \Sigma \partial U_0/\partial x_0, and \Sigma w_i U_3 is the value of \partial H/\partial x_0 at the optimum. (If the set of expected-utility outcomes of bargaining is convex, H is linear and \Sigma w_i U_3; otherwise, \Sigma w_i U_3 may depend on (U_0, U_1, U_2) and does not necessarily equal \Sigma w_i U_3 at the optimum.) Normalize H and make linear transformations of U_0 and U_1, if necessary, to set \Sigma w_i U_1 = \Sigma w_i U_2 = 1. In the three-issue case, the first-order (Euler) conditions for maximizing H or \Sigma w_i U_i, subject to F(U_0, U_1, U_2; \theta, T) = 0, for each \theta and T, are then as follows, if F = 1:

\text{(5) } \delta U_0/\delta x_0 = \delta U_1/\delta x_0 = \delta U_2/\delta x_0, \delta U_1/\delta x_1 = \delta U_2/\delta x_2, \delta U_0/\delta x_2 = 0, \delta U_1/\delta x_1 = \delta U_2/\delta x_1, \delta U_0/\delta x_2 = \delta U_1/\delta x_2 = \delta U_2/\delta x_2,

\text{for } k = (1, 2, 3), \text{ for every } \theta \text{ and } T. \text{ Here: } U_0 = \partial U_0/\partial x_0, U_1 = \partial U_1/\partial x_0, U_2 = \partial U_1/\partial x_0, U_3 = \partial F/\partial x_1,

\text{and } U_0 = \partial U_1/\partial x_2 \equiv \partial F/\partial x_2. \text{ Let } X = (F, E_0) \text{ at } x_0 \text{ levels corresponding to some } \theta \text{ and } T \text{ and } T, \text{ and assume that } F \text{ is fixed at } (F, E_0) \text{ at levels corresponding to some } \theta \text{ and } T \text{ change from } (\theta, T). \text{ Then } \partial U_0/\delta x_0 = \partial U_1/\delta x_0 = \partial U_2/\delta x_0 = 0, \text{ and } \partial U_1/\partial x_1 = \partial U_1/\partial x_2 = 0, \text{ where } \partial U_0/\partial x_0 \text{ is some absolute risk aversion under those conditions, then:}

\text{(6) } \frac{\partial x_0}{\partial x_1} = \frac{U_0}{U_1}, \text{ for any risk-averse } \theta \text{ and } T \text{, Propositions Seven and Eight then hold, provided no constituency is risk-prefering, in the sense of having a negative risk aversion.
Proposition Seven (Monotonicity): If each constituency is risk averse (\(p_i < 0\) always holds), any unanimously real increases or decreases in \(X_k\) are shared among all constituencies. If one or more constituencies are risk neutral, they share all real increases or decreases in \(X_k\).

Finally, Proposition Eight, provided in the appendix, applies to the single-issue case. It applies when there are three issues, only if the optimal price weights remain constant, relative to one another, as \(\theta\) changes.

Proposition Eight (Risk-sharing): For any fixed \(T\), let \(X_k(0)\) be \(k\)'s certainty-equivalent share of surplus at \(\theta\), when bargaining concludes, with mean \(X_k = \int X_k(0)dG\) and variance \(\sigma_k^2\). If \(k\) has a smaller absolute risk aversion than \(j\), for all \(\theta\), \((X_k - X_j(0))/(X_k - X(0))\) and \(\sigma_k^2/\sigma_j^2\) have a smaller relative risk aversion, for all \(\theta\), \(X_k\) will be more rigid than \(X_j\), in the sense of having a lower coefficient of variation.

CONCLUSION

This paper takes an unorthodox view of the role of voting in democratic group choice. When majority voting threatens inefficient outcomes, this serves as an incentive to negotiate reductions in disagreement before voting begins. Conversely, if negotiations are costly, the prospect of voting under the majority rule potentially improves bargaining efficiency, even to the point of making every constituency better off than it would be under a rule requiring unanimous agreement. This is true despite a Condorcet paradox. The bargaining outcome also maximizes a social welfare function, whose arguments are the utility indices of the democratic organization's political constituencies. Under all around risk aversion, increases and decreases in the surplus available to the organization are shared among all constituencies in such a way that the least risk averse effectively insures the others.

FOOTNOTES

1. In addition, if a sufficiently wide variety of bargaining relations (U(A)) is admissible, it can be shown that axiom 3 can be derived from relations (4) and Proposition Two below.

2. There may be points \((u_1, u_2, u_3)\) in U(A), such that \(u_1 > u_2\) and/or \(u_3 > u_2\). At least one of the first two legislators would then do better than his opportunity cost, a result that potentially raises \(U_j(G)\), for each \(k = 1, 2, 3\), by comparison with equations (1) below. (Once this change is made, however, the subsequent discussion can stand as is.)

3. Recall that each \(k\) has the same time rate of discount. If these rates differ, each \(\bar{W}_k\) will depend on \(\theta\), but not on \(\theta\). If each constituency has a different subjective probability distribution, \(Q_k(T, \theta)\), the bargaining outcome will effectively maximize a social welfare function and provide for additional income transfers ("side bets") to cover differences in subjective probability densities, for each \(\theta\) and \(T\) (Wilson, 1968; and Borch, 1969).

REFERENCES

Apostol, T.M. (1957) Mathematical Analysis (Reading: Addison-Wesley).


MATHENATIONAL APPENDIX

With reference to axioms 1-4, bargaining cost is apt to be minimized for extreme outcomes, where \(k\) receives \(u_{k1}\) for some \(k = 1, 2, 3\), and where \(i\) and \(j\) do not bargain, for \(i = j \neq k\). Therefore, we have no guarantee that \(U(A)\) will be convex. Moreover, convexity is unnecessary to derive the Kalai-Smorodinski bargaining solution from axioms 1-4. The key to proving this result is to find a symmetric set contained in a normalized version of \(U(A)\), with the same bargaining solution as \(U(A)\). To see this, normalize \(U(A)\) by making linear transformations of the underlying utilities so that each \(U_{kb} = 0\) and each \(U_{kb} = 1\). Let \(U^0\) be defined initially as the point of intersection between the Pareto frontier of the normalized \(U(A)\) and the straight line through the origin whose slopes are equal to one. Clearly, we can find a symmetric set which contains the points \((0, 0, 0), (0, 0, 1, 0, 0, 1), (1, 0, 0, 1, 0, 1), and U^0\), and which is, itself, contained in the normalized \(U(A)\), even if \(U(A)\) is not convex. By axiom 3, \(U^0\) is the vector bargaining solution of the symmetric set, and, by axiom 2, of the normalized \(U(A)\). By axiom 1, the certainty-equivalent \(Y\)-vector associated with \(U^0\) is unaffected by the linear transformations.

Finally, assume axioms one and two, along with Proposition Two, but not necessarily axiom 3. Consider the set formed by the union of \(T\) line segments of unit length along the axes with the symmetric cube whose opposite vertices are the origin and \(-1, -1, -1\), for any \(\theta = 0\). If these bargaining sets are admissible, their solutions must be given by each \(U_{kb} = 0\), from (4) and Proposition Two, Axiom 2 then extends this result to all symmetric bargaining sets.

The following shows how to find the \(P^*\) of Proposition Five, such that \(U_{kb}(P^*) = U_{kb}(Q)\) for each \(k\). In general, \(U_k\) will depend on \(m\) and on \(U_{km}(0), U_{km}(0), U_{km}(0), (0, 0, 1), (0, 0, 1), and U^0\), as indicated in \(D^0\). To simplify the notation below, \(U_{km}\) will henceforth denote \(k\)'s expected bargaining outcome. (That is, the star is dropped.)

To find \(P^*\) in the simplex given by all \(P\), such that \(U_{kb}(P^*) = U_{kb}(Q)\), for each \(k\). In general, \(U_{kb}\) will depend on \(m\) and on \(U_{km}(0), U_{km}(0), U_{km}(0), (0, 0, 1), (0, 0, 1), and U^0\), as indicated in \(D^0\). To simplify the notation below, \(U_{km}\) will henceforth denote \(k\)'s expected bargaining outcome. (That is, the star is dropped.)

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where \( C_1 = [(MU_{10} - MU_{100}) + (MU_{20} - MU_{200})], \) and \((C_1 - C_2) = [(MU_{10} - MU_{100}) + (MU_{20} - MU_{200})] > 0.\) Thus, if \( C_1 = 0, \) set \( \delta_1 = 0 \) and \( \delta_2 > 0.\) If \( C_1 = 0, \) set \( \delta_1 > 0 \) and \( \delta_2 = 0.\) Otherwise, set \( \delta_1, \delta_2 \) so that \( \delta_1 > 0 \) and \( \delta_2 > 0.\) If \( C_1, C_2 \) have opposite signs \((\text{i.e., } C_1 > 0, \ C_2 < 0), \) set \( \delta_1, \delta_2, \delta_2 > 0.\) Moreover, if \( C_1, C_2 \) are both positive, set \( \delta_1, \delta_2 > 0.\) Reverse the last inequalities, if \( C_1, C_2 \) are both negative. It is easy to see that \( \delta_1 < 0 \) and \( \delta_2 > 0.\) Let \( \delta_1, \delta_2 > 0.\) In conclusion, I will prove Proposition Eight, using the following theorem (e.g. Apostol, Mathematical Analysis, p. 245, problem 9–14): Let \( f(x) \) and \( h(x) \) be two functions that are either increasing or decreasing and that are also integrable. Then \( \int f(x)h(x)dx < \int f(x)h(x)dx, \) provided \( \int g(x)dx = 1 \) and \( h(x) \) and \( f(x) \) are both increasing or both decreasing. If one is increasing and the other is decreasing, the inequality is reversed.

If \( \theta \) change, for any fixed \( T. \) Then (2a) can be rewritten as follows:

\[
R_1(U_1X_1)X_1(\theta) - R_1(U_1X_1)X_1(\theta) + R_1(U_1X_1)X_1(\theta)
\]

where \( X_1(\theta) = \frac{dU_1}{d\theta}, \) for \( k = 1, 2, 3. \) Let us further normalize the utilities by setting each \( U_1 = 0 \) and \( U_1 = 1, \) when \( \theta = 0. \) (It is easy to check that this is consistent with the normalizations suggested in connection with equations (1a).) If \( R_1(U_2) > R_2(U_2), \) for all \( \theta, \) equations (1a) imply that \( (X_1 - X_1)X_1(\theta) \) is an increasing function of \( \theta. \) The latter implies, in turn, that \( \int (X_1 - X_1)X_1(\theta) \) is an increasing, concave function of \( (X_1 - X_1), \) with first derivative \( X_1(\theta), \) and second derivative \( U_1X_1(U_1 - U_1). \) Therefore, \( (X_1 - X_1)(0) = (X_1 - X_1)(0) < \int (U_1 - U_1) \) for 0.

Finally, let \( R_1(U_2) > R_2(U_2), \) be its relative risk aversion. If \( R_2(U_1) > R_2(U_2), X_1(\theta) \) is an increasing function of \( \theta, \) from (4a). Therefore, \( \int (X_1 - X_1)X_1 - \int X_1(\theta)X_1(\theta) \) is positive. The same integral, but with \( \theta \) reversed, is negative. From here, it is straightforward to show that \( \theta < 0 \) and \( \theta > 0, \) as desired.

**INTRODUCTION**

Donald McCloskey's forays into methodology, first in his 1983 article and now in an expanded, more restrained book, *The Rhetoric of Economics*, are likely to infuriate many and delight others. The book is a sustained, frontal assault on "modernism" and the desirability and viability of any methodology. These, he argues, are the lingering manifestations of obsolete ideas that stipulate the pursuit of knowledge and, in any case, establish criteria that are not realizable or even adhered to in practice. The thrust of McCloskey's positive thesis is to argue for the primacy of "rhetoric" in economics, the literary character of economic science, and to show case studies that various rhetorical categories (such as figures of speech, metaphor, appeal to authority) do indeed pervade economists' discourse.

McCloskey's book is witty, iconoclastic, irreverent, and sometimes even brilliant. There is much in the book that I am in agreement with and that I believe needs to be said. Yet, I also harbor concerns about McCloskey's advocacy of "anything goes" (methodologically) and what I take to be his (unintended) trivializing of the nature and significance of rhetoric. I shall argue in Section II that in matters methodological anything does not go and in Section III that McCloskey's conception of rhetoric is incomplete. As a result, his desire to purge prescriptivism from methodology (which I endorse) is overwhelmed by his rejection of any rules (which I do not endorse), and his reduction of rhetoric to "literary criticism" leads to the epistemological irrelevance of rhetoric and hence to an argument for its second-rate status.

**DOES ANYTHING GO (METHODOLOGICALLY)?**

According to McCloskey (1985a) the "official methodology of economics is modernism" (p. 5), an amalgam of philosophical tenets roughly corresponding to positivism, but also including "scientism, behaviorism, operationalism, positive economics, and other quantifying enthusiasms of the 1930s" (p. 4). Economists pay homage to modernism but do not actually practice economics according to the "Ten Commandments and Golden Rule of modernism" (pp. 7–8).

Discussion in Chapters 5–7 of the work of Samuelson, Becker, Solow, Muth, and Fopol simply demonstrates that the criteria for rationality embedded in positivism do not provide useful guidance for scientific activity. In contrast to positivism, McCloskey's concern is appropriately the rationality of people, not the rationality of propositions as true or false determined by verification, confirmation, or probabilistic inference.

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