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The Disunity of Unanimity

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Abstract. Unanimity is the optimal voting rule in a world of zero transactions costs, when side payments are impossible. When side payments are available and transactions costs are zero, the voting rule is irrelevant to the ultimate outcome. In the more realistic situation where side payments are allowed but transactions costs are positive, a unanimity voting rule creates situations where the collective choice may fail a proposed measure even if all members favor the measure in principle. This evidences a disunity between unanimity rules and unanimous outcomes. Constitutional design should focus on rules leading to unanimous outcomes, as opposed to unanimity rules.

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1. Introduction

Much has been written about unanimity as a voting rule. Wicksell (1896) was the first scholar to examine the attractive normative properties of unanimity as a voting rule. In the case of zero transactions costs, a unanimity rule ensures that all Pareto-superior proposals will be enacted. Further, in a world of no side payments, it is the only rule guaranteeing that only Pareto-superior proposals pass. In principle, these properties make unanimity an attractive voting rule that a representative individual would be likely to choose at the constitutional stage. Indeed, Buchanan and Tullock (1962) argue that unanimity is the optimal voting rule if there are no transactions costs.

However, implicit in the Buchanan and Tullock analysis is some restriction on side payments. That is, if there are zero transactions costs and side payments are allowable, the choice of a voting rule is irrelevant to the final outcome, as all gains from trade will be exploited. Recognizing this, a representative individual will be indifferent between voting rules at the constitutional stage, as long as side payments are permitted and transactions costs are zero.

The assumption of zero transactions costs is quite unrealistic, however. Transactions costs in terms of simply reaching a consensus, as well as the strategic costs of bargaining change the outlook of a player at the constitutional stage significantly. Wicksell's recognition of this led him to suggest a voting rule slightly less strict than unanimity, and Buchanan and Tullock went into great deal about what was involved in choosing the optimal "non-unanimity rule." Even in the side payment world, the choice of voting rules

is no longer irrelevant once we consider transactions costs. In fact, under these parameters, unanimity is strictly inferior to a sub-unanimity rule.

In this article, we lay out this fundamental disunity of unanimity. That is, we show how a representative individual's evaluation of unanimity will vary considerably, depending upon his expectation of transactions costs and the role of side payments.

2. No Side Payments

We begin with an example in which three agents with identical bargaining power must choose what size coalition is necessary to determine how substantive policy choices must be undertaken. Specifically, in this first example, the individuals decide how to distribute some exogenously provided "manna" from heaven in a situation where there can be exchange of some other good for a larger share of the surplus. The three candidates for such a coalition size are: 1) a one-voter coalition (dictatorship rule); 2) a two-voter coalition (majority rule); and 3) a three-voter coalition (unanimity rule). In the process of making this decision, each voter must consider the utility he expects to get under each of these regimes.

Under the dictatorship rule, each voter has an equal chance of being chosen dictator. Obviously, whoever is chosen dictator will retain the surplus for himself, ignoring any possible altruistic motives he may have and assuming that once he is named dictator, he has no need to appease the other agents to retain his position. Thus, for each voter, there is an expected value equal to the probability he is named dictator multiplied by the utility he gets from that position. In our example, with the total surplus normalized to 1, this expected utility is as follows:

$$(1/3) * U(1). \tag{1}$$

Under the majority rule, each voter again examines his expected value from the rule. With three total agents, there are three possible majority coalitions: (1, 2), (1, 3), and (2, 3), each of which is equally likely to occur. Given our assumptions of equal bargaining power, no altruistic motives, and no need to appease the excluded, the eventual coalition will choose to split the surplus equally among the two coalition members.[2] Any individual voter has a 1/3 chance of being excluded from the coalition, giving him an expected value of the majority decision rule as follows:

$$(2/3) * U(1/2). \tag{2}$$

The last case to consider is the unanimity rule. Given our assumption of zero transactions costs, which includes the assumption of equal bargaining power, the expectation under the unanimity rule is:

$$U(1/3). \tag{3}$$

If we invoke the standard assumption of concave utility functions, by Jensen's inequality,[3] $U(1/3) \geq (2/3) * U(1/2) \geq (1/3) * U(1)$, with the operators being strictly

greater than for strictly concave utility functions. It is clear in this example then that the voters would rationally bind themselves to the unanimity rule. Even in the situation where a new dictator is chosen or a new two-person coalition is formed to allocate a new surplus each period, the qualitative argument would still hold.

A corresponding argument applies in the public good case. Assuming that G is a non-excludable good the consumption of which is non-rivalrous, the political question is not one of distribution but rather one of provision. A good deal of government activity is concerned with the ''market failure'' traditionally associated with such goods. Thus, it would be attractive if the meta-bargain described above could also account for the public good case. If government were only concerned with distributional issues, the non-rivalrous consumption of a public good would make the decision rule moot, assuming there is no question regarding the appropriate level of production as would be the case among identical individuals because preference revelation is no longer a problem. The only remaining question for government is the appropriation of the cost of the public good.

For each individual, *ex ante*, the choice of voting rule depends upon his cost share. He desires to maximize his utility, which would be a function of G and the composite private good X. His level of X will be dependent upon his level of after tax income, which is dependent on the portion of G's cost (C) he is forced to pay. The choice of the dictatorial voting rule will provide the voter with an expected tax share of 2/3*(1/2 C) because the dictator will impose half of C on each of his subjects. The majority voting rule, similarly, will allow the majority coalition to impose C on the excluded member, generating an expected tax share of 1/3*(C). The unanimity rule guarantees each individual the tax share of (1/3 C). Of mathematical necessity, each of these voting rules generates an expected tax burden of 1/3 C, but the expected utility generated by these rules is not equal except in the case of linear utility functions. It is trivial to show that in the case of concave utility functions, the voting rule preference mapping is the same as above because the tax share would enter the utility function as a negative. Essentially, the public good case represents a division of cost and is completely isomorphic to the exposition above regarding the distribution of surplus.

2.1. Harsanyi's Social Welfare Function as a Constitutional Principle

Our analysis bears resemblance to Harsanyi's derivation of the Benthamite social welfare function from the axioms of Bayesian decision theory. Harsanyi (1955, 1992) proposes an equiprobability model for moral value judgments. He shows that if: 1) Individual personal preferences satisfy the von Neumann-Morgenstern-Marschak axioms of choice; 2) Individual moral preferences satisfy the von Neumann-Morgenstern-Marschak axioms of choice; and 3) If two policies A and B are indifferent from each individual's perspective, there is social indifference with respect to A and B, then the implied social welfare function takes the form:

$$W = \sum_i a_i U_i, \tag{4}$$

where the weights assigned to each individual's utility are all equal.

Our analysis above posits that, at the constitutional stage, each individual considers the respective probabilities of being exploited rather than being able to exploit other losing coalitions, and the relative payoffs of each alternative outcome. From this *Gedanken* experiment, we show that individuals will rationally choose the unanimity rule, based on their *ex ante* expectations. Relying on this same kind of experiment, Harsanyi derives his social welfare function. Using similar fundamentals, we achieve similar ends, operationalizing the Harsanyi rule in the constitutional or contractarian context, outside of the ethical or moral context in which it was originally formulated.

2.2. Unanimity and Non-Consequentialist Ethics

Unanimity is supported by even non-consequentialist moral codes. Unanimity is the only voting rule that guarantees the Kantian (Kant 1785) categorical imperative: Always choose in such a way that in the same volition the maxims of the choice are at the same time present as universal law. That is, the only voting rule under which a minority can never be used as a means to some end for the majority is unanimity in which, effectively, there is no minority. Unanimity secures what Kant calls the "supreme principle of morality," the autonomy of the will. This sort of argument, in the economics jargon of external costs, is implicit in Buchanan and Tullock's support of unanimity, and Nozick (1974) specifically invokes Kant in his support of the minimal state.

3. Side Payments without Transactions Costs

What of more complicated collective decisions, such as the provision of goods over which the voters have different preferences? Clearly in such a case the unanimity requirement might not be optimal. For example, if the provision of a marginal unit of some good provided great net benefits to Voter 1, but infinitesimally small net losses for Voter 2 and Voter 3, we might desire a social choice rule that required the provision of the unit. Under a unanimity rule, the unit would not be provided unless there was some vehicle of trade available by which Voter 1 could compensate the other two.[4] This vehicle could involve some sort of side payment, including a logrolling payment that took the form of a future vote on some issue where Voter 2 and or Voter 3 hold strong preferences and Voter 1 holds a relatively weak preference in the opposite direction. Assuming enforceable agreements (i.e. voters could not renege on these bargains), we would expect to reach some global optimum in which the aggregate benefits produced by the bundle of collective decisions exceeded the aggregate costs, both financial and external.

The currency of the exchange implied by such a political process could take many forms. We could think of pecuniary side-payments as the simplest means of exchange, but the contemplation of such a possibility would unavoidably raise policy concerns. Public law scholars occasionally object to the "commodification" of political consensus. It is argued that the commodification of the vote would undesirably encourage citizens to bring their own self-interest into the process, at the expense of the aspirational and expressive qualities of the political exchange to the detriment of the community at

large.[5] Because of these objections, a more subtle approach might develop.[6] Specifically, in a functioning legislature of some sort, future votes might serve as the means of exchange.

Logrolling,[7] or vote trading, could conceivably serve as an alternate vehicle for the political quid-pro-quo that would take place under a system with side payments. Vote trading of this type is likely to occur under any voting rule,[8] as coalitions develop to secure the passage of bundles of legislation.

This begs the question, however, of how a unanimity rule with vote trading differs from a sub-unanimity rule with vote trading. For example, it would be the case that even under a majority decision rule, a minority with a strong preference will attempt to bribe a majority with a relatively weak preference, leading to collective action only being taken when the aggregate benefits exceed the aggregate costs of undertaking such an action. The answer lies in the notion that the unanimity rule gives each individual a property right in the status quo. That is, under majority rule, the majority will enact its preferred policies without compensating the minority. Of course, if the minority suffers a loss greater than the majority's gain, there will be gains from trade. If the loss, however, is smaller than the majority's corresponding gain, no compensation or trade will take place, despite the existence of an external cost. Under a unanimity rule, these external costs must be internalized by those who favor a given policy, requiring them to compensate those who lose from the policy for their loss relative to the status quo. That is, Pareto optimality is achieved.

However, behind the veil of ignorance at the constitutional stage, the representative individual will not know whether or not he will prefer the status quo or not. Thus, this property right will be of little benefit for him, since he faces the same likelihood of being the one who must compensate others for a movement from the status quo as he is to be the beneficiary of such compensation. Recognizing this, the individual will simply consider the expected welfare accruing under each voting rule after all bargaining has taken place.

3.1. Effective Unanimity

Following Parisi (1998 and 2002), consider the simplest case of a two-dimensional policy space (G_1, G_2) with three voters (1, 2, 3) who are allowed to bargain and offer side-payments in a generic consumption good (Y) in exchange for policy concessions from the other voters. The existence of concave and well-behaved[9] utility functions for all voters guarantees the existence of a single policy outcome satisfying the Pareto criterion of efficiency[10] and the Benthamite criterion of social welfare.[11]

The intuition behind the above proposition is relatively straightforward. The geometry of the model can be illustrated with a functional example, which allows the study of other interesting properties of the bargaining result as it relates to the Benthamite and Nash standards of social welfare.

Under conditions of concavity of the voters' utility functions, there is a global maximum which characterizes the social welfare properties of the bargaining result under a unanimity rule. Such an equilibrium will generally be found at the center of the policy space. These

uniqueness and centrality results are robust to different forms of preference aggregation, as shown in the following sections.

3.1.1. *Benthamite Social Welfare and the Market for Votes*

To examine the welfare implications of the bargaining result under the Benthamite criterion of social welfare,[12] consider again the three voters 1, 2, and 3 with concave utility functions:

$$\mathrm{F_i}(\mathrm{G_1}, \mathrm{G_2}) = f\left[(\mathrm{G_1}^* - \alpha_\mathrm{i})^2 + (\mathrm{G_2}^* - \beta_\mathrm{i})^2\right]. \tag{5}$$

To simplify the notations, the arguments of the function are renamed

$$\mathrm{w} = \left[(\mathrm{G_1}^* - \alpha_\mathrm{i})^2 + (\mathrm{G_2}^* - \beta_\mathrm{i})^2\right]. \tag{6}$$

For the purpose of this illustration, assume that the voters' ideal points A, B, and C are equidistant from the policy point P*. The squared radius connecting each voter's ideal point to P* will thus be $(\forall_\mathrm{i}^2 + \exists_\mathrm{i}^2)$ for all voters, in spite of the possible differences between the respective $\forall_\mathrm{i}$ and $\exists_\mathrm{i}$. This allows one to drop some unnecessary notations from the first order conditions found below.

The summation of these functions is denoted as:

$$Z(G_1, G_2) = \sum_{i=1}^{3} f_i(G_1, G_2). \tag{7}$$

Maximizing Z with respect to $\mathrm{G_1}$ and $\mathrm{G_2}$ and solving for all $\mathrm{i} = 1, 2, 3$ assuming equally shaped utility functions centered around different ideal points, there will be a central point P*, such that the voters' ideal points will lie along the $[\forall_\mathrm{i}^2 + \exists_\mathrm{i}^2]$ radius.

If voters have similarly shaped utility functions (in this case, spherical curvatures), centered around different ideal policy points, then the Benthamite social optimum is to be found at the "center of mass" of the policy triangle whose vertices represent the voters' optimal policy positions. As it happens, the result that was generated by the bargaining in a unanimity regime satisfies the Benthamite criterion of social welfare. If voters have utility functions with different curvatures, the result would differ algebraically. The properties of the derived Benthamite equilibrium — uniqueness and centrality in the policy space — however, would remain, subject only to the strict concavity of the voters' preferences.

3.1.2. *Nash Social Welfare and the Market for Votes*

One can now study the welfare implications of the bargaining result in a unanimity regime in conjunction with the Nash criterion of social welfare.[13] Consider again the three voters

1, 2, and 3 with concave utility functions

$$\mathrm{F_i}\ (\mathrm{G_1}, \mathrm{G_2}) = f\left[(\mathrm{G_1}^* - \forall_\mathrm{i})^2 + (\mathrm{G_2}^* - \exists_\mathrm{i})^2\right] \tag{8}$$

and denote the arguments of the function

$$w = \left[(\mathrm{G_1}^* - \forall_\mathrm{i})^2 + (\mathrm{G_2}^* - \exists_\mathrm{i})^2\right]. \tag{9}$$

The multiplication of these functions may be expressed as:

$$H(G_1, G_2) = \prod_{i=1}^{3} f_i(G_1, G_2). \tag{10}$$

If voters have identically shaped utility functions centered around different ideal policy points, the Nash social optimum coincides with the Benthamite social optimum studied above. Given the assumed "symmetries," the bargaining outcome satisfies both the Benthamite and the Nash criteria of social welfare. Conversely, if voters have differently-shaped utility functions, the Pareto-optimal point achieved through bargaining will not simultaneously satisfy the Benthamite and Nash criteria of social welfare. Indeed, the Benthamite and Nash social welfare functions would have different critical values. Given the different curvatures, the grand-sum and the grand-product of voters' utility would be maximized at different points of the policy space. However, even assuming voters with different ideal points and differently shaped utility functions, the Benthamite and Nash optima — reached at different points in the policy space — will share the same properties of uniqueness and centrality, subject only to the strict concavity of the voters' utility functions. It is interesting to note that, in the absence of transaction costs, the Benthamite optimum, rather than the Nash optimum, will be reached through voters' bargaining under a unanimity rule.

Parisi's "Political Coase Theorem" then implies that the voting rule is irrelevant to the final outcome. In a political environment where side payments can occur with zero transactions costs, the welfare maximizing bundle of policies will be reached, regardless of what voting rule is in effect. Obviously then, a representative individual is indifferent between voting rules at the constitutional stage since they all lead to effective unanimity.

4. Side Payments with Transactions Costs

An important assumption of the bargaining results derived above is that bargaining is not impeded by transaction costs. A costless transaction requires the absence of strategic behavior in the bargaining process. As pointed out by Buchanan and Tullock (1962), this condition is highly problematic in the context of unanimity voting.[14] The opportunity for individual strategic behavior is elevated where each individual voter holds an effective veto power over any policy proposal of other voters' coalitions.

The economic mechanism of veto power should be taken into consideration in examining the efficiency losses due to strategic behavior of the veto holders. Essentially, a unanimity rule allows for significant strategic behavior. The hold-out problem becomes very costly, as each voter has the incentive to refrain from joining the bargain in the hopes of increasing his share of the joint surplus.

This incentive implies that a unanimous voting rule will hinder the achievement of a unanimous outcome. Even if all voters agreed in principle to a policy proposition, they will likely fail to reach a unanimous consensus, if subjected to a unanimity rule. This can be demonstrated through a multiple-agent veto model similar to those used in the recent literature on cross-exclusion rights (e.g., Schulz, Parisi, and Depoorter 2001). Consider a legislative bundle, which comprises n proposals. Assume that the joint proposal is beneficial to all voters. Each individual voter contributes through his own support and investment to the approval of the proposal. The passage of the entire bundle requires the participation of a fixed number of voters. Each voter can influence through payments and persuasion other individual voters. Likewise voters can indulge in opposition, thus falsifying their preferences, in order to receive side payments from other voters. Let the investment of voter i be denoted by x_i, representing the participation investment under the form of pressure exerted toward other voters or forgone opportunity to be the recipient of side payments, once joining the coalition. The participation investment of some voter i does increase the probability of passing, thus increasing the value of other voters' participation, as the coalition approaches the required majority. Suppose the utility of voter i is of the linear quadratic type and c denotes the constant marginal cost of investing x_i (lobbying with other voters or forgone evaluated in terms of the numeraire):

$$V_i(x_1, x_2, \ldots, x_n) = a\, x_i - {}^1\!/_2 \left(x_i^2 - \frac{2\theta}{n-1} x_i \sum_{j \neq i} x_j \right) - c x_i. \tag{11}$$

Here $0 < \theta < 1/2$ denotes the positive impact of the investment of the remaining voters on the utility of voter i. The decision to invest can be described by the Nash equilibrium of a simultaneous move game. Solving the first order conditions yields the investment level

$$x_i^f = \frac{a-c}{1-\theta}. \tag{12}$$

We should contrast this participation equilibrium to the alternative equilibrium where the policy outcome is controlled by a single individual, who fully captures the interest and utility of all his subjects (i.e., perfectly benevolent lobbyist). Such an individual's total valuation of the policy is given by the sum of the values of the individual proposals for all the subjects:

$$V(x_1, x_2, \ldots, x_n) = (a-c) \sum_i x_i - {}^1\!/_2 \left(\sum_i \left(x_i^2 - \frac{2\theta}{n-1} x_i \sum_{j \neq i} x_j \right) \right). \tag{13}$$

Maximizing this expression yields

$$x_i^u = \frac{a-c}{1-2\theta}. \tag{14}$$

From this it follows immediately that, in the case of the concentrated decision-making carried out by a benevolent agent, the supply of optimal policies is larger than in the case of uncoordinated voters' participation under a fixed majority rule. Put differently, if the various voters could effectively pre-commit to cast their vote truthfully and not engage in strategic preference falsification, valuable policy choices would be carried out. However, more can be seen here. Firstly, the difference between the optimal level of voters' per-unit investment in the unified case and the equilibrium level of voters' per-unit investment in the fragmented case increases in θ. Hence, the degree to which voters under-invest increases with the degree to which they are affected by the participation of others. In the context of voting, this signifies that the problem is greatly exacerbated as the voting rule approaches unanimity. The hold up of one voter under a unanimity rule dissipates the value of the participation for all other voters. This dissipation of value amounts to an externality. The stronger the externality of each owner's investment, the more serious the incentive problem becomes. Secondly, *ceteris paribus*, aggregate investment in the fragmented decision-making case differs more if the number of voters increases. Hence, in large collective decision-making situations with a large number of voters, the paradox of participation is exacerbated.

Note that this is an example of a democratic participation of equal voters in a collective decision-making subject to a unanimity rule. Voters act on the same level of the value chain, with respect to investment in the policy proposal's passage. Unanimity rules grant individual veto rights to individual voters. This creates a likely hold-up problem because the overall outcome is influenced independently by multiple parties, each facing a positive externality problem in their participation choice. Even voters who might unanimously agree to a policy proposal when voting under a majority rule may paradoxically fail to reach such consensus, if subject to a unanimity requirement. Thus situations that would generate unanimity as an outcome (*ex post* unanimity), would likely fail to yield such a result, if unanimity is set as a voting requirement (*ex ante* unanimity).

The hold-up problem described above is not different from any other hold-up problem when multiple parties have a veto power over a mutually beneficial prospect. If acting under a unanimity rule, one individual's hold-up generates harm for other individuals, who see their opportunities dissipated. Bargaining under a unanimity rule creates mutual opportunities for strategic hold-ups even when all voters would like to approve the common policy. Given the opportunity to receive side payments, each voter will have incentives to falsify his preferences generating negative externalities for other voters. As a result, the willingness of voters who individually favor a given policy to act according to their true preferences may be seriously undermined. Every individual wishes to be a dissenting voter, having somebody else offer a side payment to acquire the dissenter's

approval of the proposed policy. Thus, similar to any hold-up situation, there will be a sub-optimal level of bargaining toward a unanimous policy agreement.[15]

5. Conclusion: Unanimity Rules versus Unanimous Outcomes

In this paper we have considered unanimity under each of three scenarios: no side payments or transactions costs; side payments without transactions costs; and side payments and transactions costs. In the first scenario, in the original position meta-bargain among political agents with concave preferences in the relevant policy space, each voter can achieve higher expected utility by binding himself to a unanimity rule, rather than risk the chance of being an excluded party in later period-by-period bargains. Once side payments are allowed, the voting rule is irrelevant, as effective unanimity is achieved. However, once transactions costs are considered, a unanimity rule will create situations where all voters might agree in principle to a policy proposition but fail to reach a unanimous consensus.

By contrasting the dynamics of "unanimity-as-outcomes" and "unanimity-as-decision-rules," we have brought to light two important dimensions of the unanimity problem. The constitutional design of decision-making rules should more explicitly consider these two dimensions of the problem, designing meta-rules and institutions that facilitate unanimous outcomes, while staying clear of unanimity meta-rules, given the paradox of unanimity voting illustrated above.

Notes

1. Address for correspondence: Jonathan Klick, c/o The Mercatus Center, 3301 North Fairfax Drive, Suite 450, Arlington, VA 22201-4433, USA. Phone: 703-993-4929; fax: 703-993-4935.
2. This equal share can be supported by invoking any of the standard axiomatic bargaining results, starting with Nash (1950).
3. See Mas-Collel, Whinston, and Green (1995).
4. The existence of a numeraire different from the object of the bargaining is essential for any of the bargaining to take place. The voters' bargaining for a change in the distribution of tax burdens, for example, will not be conceivable if money is the only thing that can be used as a numeraire for that exchange. It is, in fact, impossible to buy money with like money, since there would be no surplus from the trade.
5. According to Karlan (1999, p. 1711), there is a methodological tension in the current conceptualization of the right to vote: "On the one hand, the right to vote serves a powerful expressive function . . . . On the other hand, the functional point of voting is to aggregate individuals' preferences and to allocate political power (and ultimately the benefits and burdens the government confers) among groups." Karlan (1999, p. 1713) further notes that the presence of money could change voters' preferences: "If voters think of their votes as simply something to be auctioned to the highest bidder, they are likely to see the sole purpose of the political process as maximization of their own short-term self-interest."
6. At the electoral level, the 2000 presidential election prompted a highly organized vote trading effort between supporters of Al Gore and Ralph Nader. In this effort, using a number of Internet sites including voteswap.com and votexchange2000.com, Nader voters in swing states offered to trade their presidential votes with a Gore supporter in states whose presidential support was not in question. Nader supporters hoped

to ensure Nader enough votes to secure federal matching funds in the 2004 election, while Gore supporters wished to increase Gore's chances of winning. However, some officials have claimed this voting trading is illegal, and California Secretary of State Bill Jones even threatened prosecution of the web site operators if they did not cease their activities. The ACLU and the National Voting Rights Project were denied a request for a temporary restraining order against officials prosecuting or threatening to prosecute the operators of these sites in the California courts.

7. For a thorough analysis of logrolling, see Stratmann (1997).
8. Stratmann (1992) uses a three-equation simultaneous probit model to identify the existence of logrolling among agricultural interests on amendments to the 1985 farm bill in the U.S. Congress. Using a synthetic index to proxy for intensity, Stratmann finds significant evidence of vote trading among legislators from farming districts.
9. The assumption of well-behaved utility obviously refers to the functions being smooth and continuous to allow for differentiability. In the context of this Article, they carry the additional implication of single-peakedness of the individual preferences.
10. In this setting, the Pareto criterion is satisfied because nobody can be made better off without someone else being made worse off. Any policy move from the central equilibrium will be prejudicial to the interest of at least one voter.
11. See Mueller (1989).
12. See Mueller (1989).
13. See Mueller (1989, pp. 379–382); see also Nash (1950).
14. Although Mueller (1989) points out that, in experimental settings, rapid consensus is often achieved under a unanimity rule.
15. But see generally Coase (1974); Coase (1988); Parisi (1995).

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