When the unanimous voting rule is NOT the corollary to market exchange

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Abstract. The unanimous voting rule is generally viewed as analogous to voluntary market exchange. I demonstrate that when third-party pecuniary effects exist, this analogy breaks down because unlike markets, unanimous voting requires compensation for these effects. Thus, the outcomes will be necessarily, and fundamentally, different. This compensation renders the political process less efficient, and gives rise to rent-seeking behavior. Because of one-person-one-vote and high transactions costs of bargaining, this compensation is generally unfeasible, meaning an efficient market outcome will be rejected by the unanimous voting rule. This serves as another reason why a less-than-unanimous voting rule may be optimal.
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1. Introduction

Since the publication of James Buchanan and Gordon Tullock's *The Calculus of Consent* in 1962, the unanimous voting rule has served as a benchmark for evaluating outcomes of the political process. Indeed it is held that the unanimous voting rule is the corollary to voluntary market exchange. Because the unanimous voting rule requires everyone to approve, nobody is made worse off, and thus outcomes are guaranteed to be Pareto improvements just as is in the case of voluntary exchange.\(^1\) This analogy and high stature placed on the unanimous voting rule can be traced even further back in the literature to early works such as Wicksell (1958 [1896]). It also plays an important foundational role in the constitutional economics literature, where unanimous agreement of the social contract is seen to be the beginning place for efficient constitutional structures and constitutional evolution through amendment by unanimous approval.\(^2\)

This paper demonstrates that this analogy, between unanimous voting outcomes and the outcomes of voluntary market exchange, breaks down whenever two conditions are met: (1) the number of individuals exceeds two, and (2) there are third-party effects, either in the form of pecuniary or technological externalities. Because actions almost always generate pecuniary effects on third-parties, I consider this situation in the most detail. I show that there is always a difference in the market and unanimous voting outcomes under these conditions, but that its nature depends upon the size of the group involved.

In particular, I find that the unanimous voting rule differs from voluntary market exchange when
these conditions are met because: (1) it requires compensation for external effects in the final outcome, or (2) in large-group cases where the compensation cannot be transacted at low cost, the set of passable alternatives under unanimous voting will be only a subset of all efficient outcomes.

The ideas here have several important implications for public sector analysis more generally. First, the conclusions of this work give an additional, and perhaps more important reason than the holdout effect and high decision making costs for why the unanimous voting rule is not generally optimal. Second, I reveal that the voting mechanism is rather unique relative to markets because it effectively gives individuals a right to their current standard of well-being, or at least a right to interfere in the decisions of others that potentially affect their well-being, while markets do not. This additional right conferred through the political process leads to important differences in the outcomes of the political and market processes which cannot be eliminated under any decision rule. Third, because the political process effectively gives individuals this right, it creates demands for compensation or protection from pecuniary externalities. The compensation effects induced by the voting mechanism are indeed at the heart of the nature and causes of rent seeking behavior. A firm would lobby just as hard to have the public sector protect it from a polluting neighbor (technological externality) as from a new competitor (pecuniary externality). Thus, the ideas and conclusions here are at the center of current policy debates, such as the recent claims by power companies that they should be compensated for the effects of deregulation, and that firms and workers hurt by free trade agreements should be compensated for their losses.
2. Externalities, voting, and market exchange

2.1. The analogy between unanimous voting and market exchange in a two-person world

The analogy between unanimous voting outcomes and the Pareto efficient outcomes of voluntary market exchange is easily demonstrated in a two-person framework. If both persons A and B are made better-off by an action, they would both vote in favor of it, and thus the unanimous outcome guarantees a Pareto improvement. For a market exchange, the same requirement holds, and the exchange will only happen if it generates a Pareto improvement. Thus, in both cases the outcomes meet the Pareto requirement and are analogous. In other words, any agreed to voluntary exchange would pass the unanimous decision rule, leading to an equivalent set of outcomes under either process. With only two people, all benefits and costs are reflected between these two persons that form the core of both the voting group and the market exchange.

2.2. The analogy between unanimous voting and market exchange in a multi person world

Moving to a situation where society is composed of more than two persons introduces the possibility of third-party effects, better known as externalities. As is highlighted in the optimal voting rule model of Buchanan and Tullock (1962, Chapter 6), decision making costs rise as the voting rule moves toward unanimity, but external costs fall precisely to zero at the unanimous voting rule. To gain unanimous approval, all third-party effects must be fully compensated for to gain the agreement of the third party. Herein lies the fundamental distinction between the unanimous voting rule and voluntary market exchange because market exchange does not correspond to a situation with zero external costs. Markets do not require this compensation, nor a lack of external costs, for an exchange to occur. An
important difference exists in this case between two types of externalities, technological and pecuniary, and also in terms of whether Coasian-type bargaining is possible at low cost (i.e., group size). I will address these momentarily, but for now the fact that the market does not require this compensation, while the unanimous voting rule does can be demonstrated with a simple example.

Consider a situation in which a new competitor would like to enter an industry. Assume that the new firm would be greatly successful, to the point of drawing enough customers away from the existing firms to make them suffer losses in profits, and perhaps even go out of business. In the market, this outcome would be efficient, as the gains to the consumers and to the new firm combined would exceed the losses to the existing firms. Note, however, that while it is an outcome consistent with efficiency, the action itself was not Pareto superior, as the existing firms suffered losses as a result. These losses to the existing firms are external pecuniary costs of the entry of the new firm. Markets do not require compensation for these effects. In markets, the decision making parties (the new firm and the customers) are allowed to take action without the approval of other members of society (the existing firms).

In contrast, suppose the entry of the new firm was subject to collective approval by the unanimous voting rule. Now, to enter, the new firm would have to pay compensation to the existing firms to secure unanimous approval for entry into the industry. The decision making group (now the voting group) has been expanded relative to the market scenario and now includes parties who will suffer negative external effects. If indeed the entry was efficiency enhancing, there would be enough gains between the consumers and the new firm to fully compensate the existing firms for their losses. The relevant issue becomes whether the group is small enough for this compensation scheme to be
transacted at low cost. If so, then the firm will enter, but the outcome will fundamentally differ from the market because this compensation has taken place. Thus, despite the voluntary market and the unanimous decision rule both having an outcome of new entry, the characteristics of the outcomes differ due to the requirement of compensation under voting, while not under the market process. If the voting group is sufficiently large that transactions and bargaining costs preclude the compensation from being feasible, then unanimous approval will not be secured, and the entry will not occur. In this second case, the outcome is completely different from the market, and more generally the set of new entries produced under unanimous voting will be only a subset of the total new entries produced with voluntary market exchange.

Returning to the Buchanan and Tullock (1962, Chapter 6) optimal voting rule model, while external costs go to zero for the unanimous decision rule, the decision making costs grow exceedingly high. It is precisely the search and bargaining costs of transacting these compensations which composes this high decision making costs under the unanimous voting rule. In addition, the model suggests that these decision making costs (here the compensation bargaining costs) will generally be large enough that the second outcome (no entry) will generally prevail over the first (compensated entry).

In essence, there is now a divergence between the voting group composed of the full society, and the core group in the voluntary transaction, which is the two parties whose exchange generates the external effect. The unanimous voting rule requires all external effects be compensated, while the market mechanism does not. Now, I will extend this to a more detailed discussion of the types of externalities and the size of group effects.
2.3. *Types of external effects and the efficiency of market and unanimous voting outcomes*

In the previous section it was demonstrated that a fundamental difference between the unanimous voting rule and market exchange exists whenever, (1) the size of the group exceeds two, and (2) third-party external effects are present. This difference is caused by the unanimous voting rule requiring full compensation to harmed parties, while the market process does not require this compensation. Indeed it is this lack of compensation for third party effects in the market process which renders market failure in the case of traditional technological externalities. However, externalities, or third-party effects can be of two types: technological or pecuniary. The literature on this difference is well developed, and the main conclusion has been that for the sake of efficiency, technological externalities must be accounted for, while pecuniary externalities should be ignored.\(^5\) A technological externality exists when the actions of one individual directly interfere with the production function of another. A classic example is generally a polluting firm whose smoke is dirtying the freshly cleaned laundry of a nearby dry cleaner. These externalities, when not accounted for, have the potential to create a market failure. A pecuniary externality is generally viewed as a by-product of the pricing system in which price changes affect the consumer or producer surplus of others. The entry of more new Ph.D. economists into the profession might depress other economists' salaries, for example. These pecuniary externalities are generally viewed as a natural part of the competitive market process, and because it can be demonstrated that the gains outweigh the losses, they do not cause efficiency failures in private markets. With this distinction in hand, I now turn to size of group effects.
2.4. *Bargaining costs and size of group effects*

To gain unanimous approval, all third-party effects must be fully compensated to gain the agreement of the third party. In situations where the voting group is relatively small, the search and bargaining required for identification and compensation of these third parties is possible at relatively low cost. The resulting outcome of the unanimous voting rule would be a situation where full compensation to harmed parties is present. Again, in contrast, the market process requires only the two main parties agree. In situations where the exchange creates third party effects, there is no necessary requirement for compensation to the harmed third party.

Thus, the outcomes of unanimous voting with small numbers are characterized by full compensation for third-party effects, while market outcomes are not. A polluting firm does not have to compensate those harmed by the technological externality, nor does a new competitor have to compensate existing firms for the pecuniary externality imposed on them in the form of lost sales. If the production decision of the polluting firm, and the entry decision of the new firm were subject to unanimous approval, both would require compensation to the harmed parties. In the case of the pollution, a technological externality, the compensation requirement of the unanimous voting rule internalizes the externality, promoting efficiency. If the gains outweigh the losses, compensation is possible in a manner that will secure unanimous approval. In this small group case, the market process will alternatively evolve per the ideas of Ronald Coase (1960). The harmed party may offer a payment for the polluting firm to reduce output. Again, just as under the voting rule, the efficient outcome will prevail. In the case of the new competitor entering an industry, the unanimous voting rule would require compensation to the existing firms, in contrast to a market process that would not require this
compensation. In small groups with full bargaining, the same outcomes will prevail with unanimous voting as those that exist in the market, but the difference is compensation under voting but not in markets. In essence, the voting mechanism gives individuals a right to their current standard of well-being, while markets do not.

Recent trends toward deregulation in the electrical power industry have lead to power companies demanding compensation for the lost value of the removed regulations, and the passage of NAFTA was surrounded by demands for compensation by domestic firms who were going to suffer losses. The compensation effects induced by the voting mechanism are indeed at the heart of the nature and causes of rent seeking. In stark contrast, a firm who suffers losses from the entry of another firm, or a technological advance, does not get compensated in the market process.

When the size of the group grows sufficiently large to make bargaining and compensation impossible (or at least at prohibitively high cost), the analogy between unanimous voting outcomes and market exchange breaks down in a much bigger way. This is perhaps the standard situation, and again is demonstrated as the high decision making costs at the unanimous voting rule in the Buchanan and Tullock optimal voting rule model. When overcoming search and bargaining costs is impossible or too costly, situations where some third-parties are harmed will be unpassable under the unanimous voting rule. This failure is in part due to the idea of one-person-one-vote because votes are not summed and weighted by their dollar value in efficiency. Thus, an action, such as say, a new competitor opening and driving some others out of business is an efficient outcome afforded by the market process, but not under a unanimous voting rule where the compensation is prohibitively costly to transact.

Again, consider a hypothetical example. Suppose Wal-Mart wishes to open up in a small town
and the effect will be to run many smaller stores out of business. In the market, there is no requirement for Wal-Mart to compensate the losers in the competitive process. The mutual gains between consumers and Wal-Mart are all that is considered, and despite the pecuniary harm to the small stores, this outcome of the voluntary market process would be considered Pareto efficient. If the opening of the Wal-Mart was subject to collective approval using the unanimous voting rule, the winners (here the consumers and Wal-Mart) would be required to compensate the smaller stores to gain their approval in the unanimous vote. We know that because the outcome meets the standard efficiency criterion, that the gains do in fact outweigh the losses, so there exists the potential for this compensation to secure unanimous approval. It would appear that both outcomes are identical in that Wal-Mart is allowed to open. There are, however, substantial differences. First and foremost, in one case there has been compensation while not in the other. Second, if the voting group is expanded to realistic proportions, the transactions and search costs will likely render the compensation problem impossible (or at least very costly) to solve.\(^7\) Under these circumstances, it is likely that the bargaining required to secure unanimous approval cannot feasibly take place, and the vote on the opening of Wal-Mart will fail, despite its Pareto advantage. Because of one-person-one-vote, it is the number, rather than the size, of the gains and losses that gets reflected in the political process.

Thus, in summary, the unanimous voting rule differs from voluntary market exchange because:

1. it requires compensation in the final outcome, or
2. in cases where the compensation cannot be transacted at low cost, the set of passable alternatives under unanimous voting will be only a subset of all efficient outcomes.

3. Conclusions
The unanimous voting rule is often held as the corollary to market exchange. This similarity has lead to heavy reliance on this rule in many areas including constitutional economics and social contract theory. This paper demonstrates that this analogy between unanimous voting outcomes and the outcomes of voluntary market exchange breaks down whenever two conditions are met: (1) the number of individuals exceeds two, and (2) there are third-party effects, either in the form of pecuniary or technological externalities. Because virtually all voting groups exceed two, and because actions almost always generate pecuniary effects on third-parties, it would be the exception rather than the rule for the linkage not to break down. The net result is a divergence between the outcome under unanimous voting and under voluntary market exchange in terms of requiring compensation in the final outcome, or when transactions costs prohibit bargaining, the set of passable alternatives under unanimous voting being only a subset of all efficient outcomes.

The ideas here have several important implications for public sector analysis more generally. First, the conclusions of this work give an additional, and perhaps more important, reason than the holdout problem and high decision making costs for why the unanimous voting rule is not generally the optimal voting rule. By requiring less-than unanimous agreement in situations where bargaining is unfeasible, it opens the door for more of the efficient set of projects to be approved. Second, the voting mechanism is rather unique relative to markets because it gives individuals a right to their current standard of well-being, while markets do not. A person made worse off, say because of a job loss or lower wages, is given a voice in the political process to prevent the action imposing this cost. The fact that the voting mechanism internalizes these pecuniary effects is a major reason why government is inherently an institution that works to slow the economic progress afforded by the dynamic competitive
process of creation and destruction. The protection of individuals from these pecuniary effects through unemployment compensation and various other programs is a sign of this phenomenon. Third, because the political process effectively gives individuals this right, it creates demands for compensation or protection from pecuniary externalities. The compensation effects induced by the voting mechanism are indeed at the heart of the nature and causes of rent seeking behavior. A firm would lobby just as hard to have the public sector protect it from a polluting neighbor (technological externality) as from a new competitor (pecuniary externality). Thus, the ideas and conclusions here are at the center of current policy debates, such as the recent claims by power companies that they should be compensated for the effects of deregulation, and that firms and workers hurt by free trade agreements should be compensated for their losses.
References


1. Note, however, that if a unanimous final outcome is observed under a less than unanimous decision rule (such as under majority voting) it need not be a truly unanimous outcome had the unanimous voting rule been used, see Holcombe (1986, 1989).

2. The ideals of the founding principles of constitutions and unanimous approval can be found in Buchanan (1990) and Gordon (1976). See Holcombe (1991) for a discussion of the evolution and role of the unanimous decision rule in U.S. constitutional history.

3. See also Lee (1989) regarding the controversial nature of the merits of the unanimous decision rule.

4. Interestingly, the new firm is in a better position to bargain with the existing firms than is the large set of consumers. Thus, if the gains mostly accrue to the new firm, rather than the customers, this bargaining is likely to be less costly to transact. However, in standard cases, such as entry in a purely or monopolistically competitive market, the new firms enter and eventually drive market returns to zero economic profit. Here, the new firm would have little profits to bargain with because all gains are to consumers. This more typical situation would have much higher transactions costs of bargaining as the large consumer group holds the gains which must be reallocated to the existing firms.

5. For a discussion of the differences between pecuniary and technological externalities see, Meade (1952), Scitovsky (1954), and Mishan (1971).

6. Again, in a very small group case, the existing firms could offer to pay the new firm not to enter. There would exist substantial problems, however, with the ability of future (and perhaps noncredible) threats aimed at extracting more payment. However, in any case in which the entry is efficient, the potential for compensation under the unanimous voting rule is fully possible in the small numbers case.

7. See note 4 for how the distribution of gains between the new producers and consumers affects the costs of bargaining.

8. For an excellent review of how business failure is necessary for economic progress see Lee and McKenzie (1993). Lee (1991) discusses how the internalization of these pecuniary effects leads to malice and conflict between segments of society through the political process.