

Quadratic Election Law

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Abstract. The standard form of electoral system in the United States—plurality voting with one person, one vote—suffers from countless defects, most of which stem from its failure to enable people to register the intensity of their preferences for political outcomes when they vote. Quadratic voting, an elegant alternative system proposed by Glen Weyl, provides a theoretically attractive solution to this problem but is an awkward fit with America’s legal and political traditions. We identify the legal barriers to the adoption of quadratic voting, discuss modified versions that could pass muster, and show how even a modified version would address many of the pathologies of the existing system.

Introduction

Quadratic voting (QV) is a mechanism for optimal collective decisionmaking (Weyl 2012; Lalley & Weyl 2015). Posner and Weyl (2015) argue that quadratic voting is superior to traditional political mechanisms for aggregating public preferences, and advocate the gradual replacement of the voting systems used by the federal and state governments with a QV-based system. However, these voting systems are partly based on, and constrained by, federal constitutional law, which, as a practical matter, is unamendable. Another formidable barrier to reform comes from American political traditions, which close off certain avenues of reform. This means that any QV-based system would need to work around these constitutional and political norms.

In this paper, we discuss whether QV-based voting systems are permissible under American law. We argue that a QV-based system that respected American constitutional norms would be subject to certain limitations that would prevent it from producing optimal outcomes. However, we also argue that such a QV-based system, if well-designed, would be superior to the existing systems used in the United States and politically plausible reform options. In the course of comparing a QV-based system with these traditional alternatives, we also show how a QV-based system would achieve other political values more effectively than the traditional alternatives do.

By a “QV-based voting system,” we mean any of a number of possible electoral voting systems that incorporate quadratic voting to a significant extent. We can consider as a starting point a QV system that approximates the mechanism described in Weyl (2012). Imagine a town that periodically holds a referendum to determine whether a new public good will be implemented. Everyone who lives in the town is allowed to buy as many votes as he wants, paying the square of the number of votes. The proposed public good is implemented if supported

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by a majority of the votes cast, and the money that is collected is redistributed to voters on a pro rata basis.

Politically feasible QV-based voting systems would depart from this ideal in different ways. A referendum system in which people pay for votes out of their own pocket would be either unconstitutional or politically unacceptable. Instead, the government might provide each voter with an equal budget of credits, which voters spend quadratically across different elections. This equal budget requirement would prevent people with the most intense preferences from expressing them fully through voting, and also prevent people from making tradeoffs between public goods and private goods (instead, they would make tradeoffs between different public goods only). These restrictions would add noise to the outcomes, but—unless the budget is extremely low—the QV-based referendum with equal budgets would still produce better outcomes than traditional referendum voting (which is roughly equivalent to a QV-based system at the limit with budget equal to one credit).

A QV-based referendum system is a form of direct democracy, but with small exceptions here and there, we live in a system of representative democracy. Direct democracy is impracticable because citizens do not have the time and expertise to evaluate and vote on every public good produced by the government. What would a QV-based representative system look like? There are, again, many possible versions but for expository simplicity, we will consider only one, very simple version. Imagine that every (say) two years, everyone in the country votes in an election of all elected officials—federal and state representatives, the president, the governor, aldermen, and others. Everyone is given a budget of 100 credits at the age of 18.² In one's first election, one allocates as many of those 100 credits, however one wants, paying in quadratic fashion, among the candidates. One could also spend fewer than the full 100 credits. The remaining credits can be used in future elections. It might also be advisable to supply voters with additional credits—for example, 100 new credits every ten years. This QV-based representative system would enable voters to exert influence on elections in (rough) proportion to the intensity of their preferences for different candidates for different offices, across time.

In economics, voting systems are typically evaluated based on a social welfare function of some sort. When we compare a QV-based electoral system with a conventional electoral system, we ask which system produces a higher level of aggregate utility. In law, courts and policymakers evaluate voting systems based on an array of values. *Competitiveness* refers to closeness of elections and the extent that parties take turn in power. *Participation* refers to the extent that eligible voters take the trouble to cast votes and otherwise engage in political activity. *Minority representation* refers to the extent that racial minorities in a particular area are able to elect their preferred candidates and win their desired policy outcomes. *Individual liberty* refers to the extent to which citizens are able to vote and express their political views. And *alignment* between voters and representatives refers to the extent that the party affiliation and ideology of elected officials match those of the people they represent. Courts are more likely to approve a novel voting system if it advances these values, or most of them. While these criteria can obviously be given a welfarist gloss, it is doubtful they actually are used that way by courts. To

² The exact number of credits would depend on the number of elections. Experiments with quadratic voting indicate that the number of credits must be low enough to induce a sense of scarcity among the voters, but not so low as to cause frustration. See ___.

keep our discussion general, we will discuss both the economic and legal criteria for evaluating election rules.

Our plan is as follows. In Part I, we review the general case for a QV-based election system. In Part II, we focus on the law. We initially address the constitutionality of a QV-based system, and then discuss the implications of such a system for several legal areas—redistricting, voting rights, campaign finance, primary regulation, and franchise access. We argue that a QV-based system advances the values underlying these areas while avoiding the perverse consequences of the existing system. We also consider the possibility of quadratic campaign financing—a system in which the existing electoral system remains in place but donating and spending are subject to a quadratic tax. A broad theme is that many electoral policies are necessary in the first place only because of the defects of the current system of one-person, one-vote. To the extent that this system can be replaced with a QV-based system, the additional laws become less necessary.

I. Quadratic Voting and Democratic Decisionmaking

A. The Political Logic of QV

Imagine that a town holds periodic referenda, and today the question is whether public funds will be used to buy land and build a park. In a normal referendum, every adult resident can cast a single vote in favor or against the proposal, or not vote at all, and the proposal passes if it receives a majority of the votes. From the welfarist standpoint, the proposal should pass if and only if the aggregated preferences of the park supporters exceed the aggregated preferences of the park opponents.³ Obviously, majority rule does not ensure such an outcome. A minority with intense preferences will be outvoted by a majority with weak preferences.

If the town uses a QV-based mechanism, however, a minority with intense preferences will outvote the majority with weak preferences if and only if the aggregate willingness-to-pay of the minority exceeds that of the majority. Because people can buy votes, they have the power to bring to bear the intensity of their preferences on the outcome of the referendum. People with weak preferences will buy only a few votes; people with intense preferences will buy many votes. The quadratic function ensures that people with intense preferences do not buy too many votes; indeed, it ensures that the marginal cost and the marginal benefit of a vote are the same. A person who is thinking about how many votes to buy must estimate the probability of being pivotal. An additional vote will, within a range, increase the probability of being pivotal at a linear rate. Thus, the marginal benefit is linear. By setting the cost of votes as a quadratic function, the QV mechanism ensures that the marginal cost is linear as well.

If the town does not allow people to buy votes using their personal funds, but instead distributes equal amounts of credits, then the QV mechanism works less well but will normally still be superior to the one-person, one-vote system. People with the most intense preferences may not own enough credits to buy votes that reflect the intensity of their preferences; moreover, people will no longer make tradeoffs against private goods, and can only make tradeoffs against

³ This might be understood in monetary terms, albeit with the understanding that wealth differences could skew outcomes.

future public goods. The system will be noisier as a result, but will be superior to one-person, one vote, which can be understood as a limiting version of QV where everyone is given just one credit at every referendum.

B. QV in a Representative Democracy

How might QV work in a representative democracy? The voter now uses credits to buy votes for or against the various candidates who compete for offices. On election day, the voter enters the booth with (say) 100 credits, and uses them to buy votes for or against candidates for the federal House, the federal Senate, the state House and Senate, the president, the governor, the alderman, and others.

QV enables the voter to exert the greatest influence on the candidates whom he most prefers or opposes. The voter must make some complicated (but, we think, manageable) calculations. He singles out candidates who best serve his interests considering (1) their competency, (2) the extent to which they are ideologically aligned with him, (3) the extent of the powers of the offices they are running for, and (4) their probability of being elected. Consider a voter who thinks a presidential candidate and aldermanic candidate are equivalent in terms of competency and ideological alignment. He might cast more votes for the presidential candidate than for the aldermanic candidate because he thinks that the president's decisions will have more influence on his (the voter's) well-being than an alderman's. (Of course, this need not be the case.) But the voter must also take into account his probability of being pivotal. If the presidential candidate is a shoo-in, or conversely has hardly any chance at all, while the aldermanic race is competitive, the voter does better by buying votes for the alderman.

The candidates who are elected will approximately reflect the aggregated preferences of the public. Of course, once the candidates are in office, they may act contrary to the interests of those who elected them. We will not consider the possibility that the government's decisionmaking process could itself be put on a quadratic basis (see Posner & Weyl 2015, for a discussion). If the decisionmaking process is approximately efficient (as it could be if Coasean bargaining among elected officials is possible), the QV-based election system ensures that those outcomes reflect the interests of the public to a greater extent than conventional election mechanisms. If government decisionmaking is completely irrational, then the QV-based system will be no better than the conventional system but also no worse. Accordingly, the QV-based system will be at least as good as the existing system and—if, plausibly, government decisionmaking is not completely irrational—better. Moreover, elections do not just select officeholders; they also discipline officeholders by holding out the prospect of ejection from office if they displease the voters. A QV-based election system serves this disciplinary function more effectively than a conventional system because it better reflects voters' preferences.

What exactly is a conventional voting system? There are many different types. For example:

- (1) Single-member plurality voting. The population is geographically divided into as many districts as there are legislators; the population of each district votes for a legislator; each person has one vote; plurality wins.

(2) Multimember at-large voting. The population is *not* geographically divided into districts. Each voter gets as many votes as there are seats, and can allocate those votes to different candidates, but can allocate no more than one vote to a particular candidate. As many candidates as there are seats are elected, with the candidates who receive the most votes taking priority over candidates who receive fewer votes.

(3) Multimember elections with limited, cumulative, or preferential voting. Same as (2), except that each voter gets fewer votes than there are seats (for limited voting), or is allowed to distribute votes among candidates as she sees fit (for cumulative voting), or ranks the candidates by her order of preference (for preferential voting), and as many candidates as there are open seats are elected.

(4) Party-list proportional representation. Multiple seats are up for election; each voter votes for a party; and parties are allocated seats based on their share of the vote. Each party lists candidates according to priority.

Single-member plurality voting, familiar in the United States, provides the voter with no way to register the intensity of his preferences. For this reason alone, it is inferior to the QV-based system. The same is true for multimember at-large voting. The major advantage of the latter system is that it avoids the need to redistrict and thus the possibility of gerrymandering,⁴ but that—as will discuss in Part II—is not a problem for QV. The third approach—multimember elections with cumulative voting and variants—*does* allow people to register the intensity of their preferences for candidates. Under cumulative voting, a voter may use all her votes on the candidate that she likes best. However, this approach is exceedingly crude. Because of the absence of a quadratic function, the voter will, under general conditions, allot too many votes to a candidate that she cares about. In party-list voting, the voters delegate the power to the party to put the best and strongest candidates at the top of the list; but the party has only weak incentives to do this.

Alternatives (3) and (4) are interesting chiefly because they show awareness of the problem that animates QV—that voters normally cannot influence electoral outcomes in proportion to their interests—and some effort to solve this problem, albeit crudely. In the United States, where system (1) dominates, two mechanisms have evolved for allowing people with intense preferences to influence political outcomes—in other words, to counter tyranny by a majority with weak preferences. First, people can donate their time and money to campaigns. Plausibly, people with strong preferences will donate more time and money to favored candidates than people with weak preferences, and those candidates can spend their extra funds to improve the probability of being elected. However, spending money on ads and rallies is an extremely inefficient way of translating intense preferences into policy outcomes; at the same time, it may give an excessive advantage to wealthy people. Research indicates that elected officials are excessively responsive to big donors and high-income voters (Gilens 2012; Barber 2014), suggesting both inefficient levels of spending and inefficient political outcomes.

⁴ The problem is that it also can give the majority excessive power, and may tax the attention of voters.

Second, courts have developed a complex system of legal rights that can be interpreted as efforts to protect people with intense preferences from majoritarian sentiment (Posner & Weyl 2015). But judicial enforcement of rights is itself an extremely crude mechanism, as it requires judges to be able to perceive the intensity of people’s interests, and to act consistently with those interests. These assumptions are in tension with the basis of democracy, which is exactly the opposite—that voting is necessary just because government officials (including judges) lack information about public preferences and the motivation to act consistently with them.

Any of the four systems (as well as variants and alternatives) could be modified so as to incorporate a quadratic element. To keep things simple, however, we will focus on system (1)—the version that is most common in the United States—and compare it to the quadratic version of it that we introduced above.

II. QV and Election Law

We begin our discussion of QV’s legal implications by considering its constitutionality. It is reasonably clear that the pure form of QV is unconstitutional because it differentiates among voters based on their ability to pay and violates the principle of equal voter treatment. But the modified form of QV, in which each voter is given the *same* number of credits, is likely lawful, though it would require some extension of existing precedent.⁵ We then evaluate how QV would impact several areas of election law: redistricting, the Voting Rights Act, campaign finance, primary regulation, and franchise access. Beyond its promise of general welfarist improvement, QV might have a number of beneficial effects: it could destabilize partisan gerrymanders, make possible new remedies for minority groups, divert funds from campaign advertising, avoid the need for primaries, and counteract franchise restrictions.

A. Constitutionality

At least three lines of constitutional precedent are relevant to the validity of QV. The first is the rule, enshrined in Warren Court decisions and the Twenty-Fourth Amendment, that electoral regulations cannot discriminate on the basis of wealth. As the Court stated in a seminal 1966 case, “a State violates the Equal Protection Clause . . . whenever it makes the affluence of the voter or payment of any fee an electoral standard” (*Harper v. Va. St. Bd. of Elec.* 1966, at 666). The second is the one-person, one-vote principle, which means not only that districts must have roughly equal populations, but also that “all who participate in the election are to have an equal vote” (*Gray v. Sanders* 1963, at 379). And the third is the Court’s general framework for assessing electoral regulations, under which the level of scrutiny varies based on the severity of the burden imposed on voters (*Burdick v. Takushi* 1992).

At least the first two doctrinal lines, and possibly all three, indicate that pure QV is unconstitutional. It plainly distinguishes between wealthier voters, who can afford to purchase more votes, and poorer voters, who cannot buy as many. True, the number of votes purchased is a function of both ability to pay *and* intensity of preference. But the first of these is a forbidden consideration given the Court’s view that “[t]o introduce wealth . . . is to introduce a capricious

⁵ When we refer to “modified QV,” we mean QV with equal budgets. We generally refer to the representative version, but most of what we say would apply to the referendum version as well.

or irrelevant factor” (*Harper v. Va. St. Bd. of Elec.* 1966, at 668). Similarly, pure QV cannot be reconciled with the one-person, one-vote principle since some (wealthier and higher-intensity) voters may buy more votes than other voters. In fact, the policy is almost directly precluded by the Court’s holding that “it is inconceivable” that “certain of the State’s voters could vote two, five, or 10 times for their legislative representatives, while voters living elsewhere could vote only once” (*Reynolds v. Sims* 1964, at 562).⁶

Things are somewhat more uncertain, though, under the Court’s general framework of sliding-scale scrutiny. Pure QV probably imposes a severe burden on voters who would like to buy more votes but cannot afford to do so, meaning that it must be “narrowly drawn to advance a state interest of compelling importance” to pass constitutional muster (*Burdick v. Takushi* 1992, at 434). But pure QV arguably satisfies this stringent test. The state interest it seeks to achieve—electoral and policy outcomes that maximize the public’s welfare—is extraordinarily significant.⁷ And no other voting system promotes this interest as well: not conventional plurality voting, which gives voters no way to express the intensity of their preferences; not the various types of proportional representation, which only crudely allow preferences to be conveyed; and not even the modified form of QV, which denies voters the ability to make tradeoffs between private and public goods. Only pure QV results in maximal welfare gains.

Moreover, QV also advances political equality relative to the crude one-person, one-vote principle that the Court claims to endorse on equality grounds. One-person, one-vote is equal only in a formal sense. A person with strong preferences that diverge from those of the majority cannot influence outcomes even if the majority cares little. This is the famous problem of tyranny of the majority, which resulted in a long history of racial oppression in the United States even where African Americans formally enjoyed a vote. A huge swath of American voting law (discussed below) tries to advance substantive equality for African Americans by giving them, through legally mandated district manipulation, influence on political outcomes greater than that produced by one-person, one-vote without such manipulation. If the baseline from which equality is measured is taken as the distribution of preferences and interests—or well-being more broadly—then QV advances equality more effectively than one-person, one-vote.

In the end, though, it is immaterial whether the policy would survive the Court’s sliding-scale scrutiny. Pure QV clearly would *not* survive the application of the doctrines involving differentiation on the basis of wealth and the equal treatment of voters as traditionally defined. And since these doctrines would ensure the policy’s invalidation, it does not matter that it might be lawful under a different strand of precedent. We therefore turn next to the constitutionality of

⁶ It may be possible to distinguish these precedents on the ground that they addressed voting systems whose purpose and effect were to block certain categories of people—the poor and urban residents, respectively—from influencing electoral outcomes. By contrast, pure QV gives everyone—poor or rich, urban or rural—the ability to convert their dollars into votes. Moreover, by redistributing the funds collected from vote purchases, pure QV effectively gives the poor an entitlement they lacked under the systems struck down by the Court. However, these distinctions probably do not blunt the precedents’ force. They *do* mean that pure QV is quite different from a poll tax or a malapportioned district plan. But the Court’s decisions are written broadly enough to encompass not just these policies, but also others that share the crucial defect of differentiating among voters.

⁷ Like cumulative or preferential voting, QV also serves the “legitimate interest[] in providing voters an opportunity to express nuanced voting preferences” (*Dudum v. Arntz* 2011, at 1116).

the modified form of QV, with equal budgets and for the election of representatives. This is a closer question that hinges on whether voters must be treated equally in each race or overall.

First, modified QV in no way differentiates between richer and poorer voters. *All* voters receive exactly the same number of credits, regardless of their wealth, to allocate among races as they see fit. The policy thus does not run afoul of *Harper* (1966) or the Twenty-Fourth Amendment because it severs any connection between electoral influence and ability to pay.

Second, modified QV is most likely valid under sliding-scale scrutiny too. Like pure QV, it advances the compelling interest of maximizing public welfare. If pure QV is unconstitutional, there is also no better way than modified QV to promote this interest. And unlike pure QV, modified QV imposes at most a minor burden on voters: a limit on the number of votes they may cast in certain races based on the number of votes they have already cast in *other* races (as well as their overall credit allocation). This burden is comparable to that imposed by any voting system, and so suggests that modified QV would be subject only to highly deferential rational basis review. In the Court's words, when a regulation "imposes only reasonable, nondiscriminatory restrictions," "the State's important regulatory interests are generally sufficient to justify the restrictions" (*Burdick v. Takushi* 1992, at 434).

And third, there is a strong (though not ironclad) argument that modified QV is consistent with the one-person, one-vote principle. The case in favor is that the policy treats all voters equally by distributing the same number of credits to each of them and then applying the same quadratic conversion rate between credits and votes. These features mean that "every voter is equal to every other voter," and that "equality of voting power" is achieved (*Gray v. Sanders* 1963, at 379). Notably, the existing voting systems most similar to modified QV, cumulative and preferential voting, have both been upheld against one-person, one-vote challenges. "By allowing each voter the same number of votes, cumulative voting subscribes to the one-person, one-vote requirement with numeric exactness" (*McCoy v. Chicago Hghts.* 1998, at 984). Likewise, under preferential voting, "[e]very voter has the same opportunity to rank candidates when she casts her ballot, and in each round every voter's vote carries the same value" (*Minn. Voters Alliance v. City of Minneapolis* 2009, at 693).

On the other hand, modified QV differs from cumulative and preferential voting in that it allows for (in fact, requires) inequality in individual races. The whole point of modified QV is that voters will make tradeoffs among different races held at the same time, as well as among races held at different times. As a result, it is inevitable that voters will not be identically situated in any particular race. Some voters will have already used more of their credits, leaving them with fewer credits to spend in the race at hand. Other voters will have refrained from as much earlier electoral activity, and so will be able to exercise greater influence in the current race. These disparities cannot be avoided under modified QV, and indeed are necessary if voters are to be able to convey the varying intensity of their preferences. If each voter could use the same number of credits in each race, then modified QV would collapse into cumulative voting, and its unique intensity-eliciting aspect would disappear.

Whether modified QV complies with the one-person, one-vote rule thus depends on the level at which equality must be present. If it is voters *overall* who must be treated equally, over

all of the elections in which they participate, then modified QV is constitutional thanks to its equal allocation of credits. But if it is voters *in each race* who must be treated equally, then modified QV is unlawful since some voters will always have more or fewer credits left to spend in any particular election. Unfortunately, existing precedent does not address this crucial issue of the scope of the equal treatment principle. Given the courts' strong tendency to uphold alternative voting systems against one-person, one-vote challenges, though, we are cautiously optimistic that modified QV would be deemed valid. At the very least, the policy's constitutionality is plausible enough to justify an examination of its functional consequences. This is the next topic to which we turn.

B. Redistricting

Election law is commonly divided into five areas: redistricting, minority voting rights, campaign finance, primary regulation, and franchise access (Stephanopoulos 2014). We go through these areas in this order, commenting on the implications that modified QV could have for each of them. As we have already made the general point about the policy's welfarist appeal, we focus here on its more fine-grained potential effects.

We begin with redistricting: the decennial redrawing of district lines to satisfy the Constitution's equal population requirement. By most accounts, the worst redistricting problem in recent years has been partisan gerrymandering: designing districts with the purpose and effect of advantaging one party and handicapping its opponent. At both the congressional and state legislative levels, the extent of gerrymandering is greater today than at any point in the modern redistricting era (Stephanopoulos & McGhee 2015). This rise has been fueled by both technological advances and heightened partisanship.

Crucially, gerrymandering is only possible if a mapmaker can reliably *predict* the electoral performance of different districts. Take, for instance, the common gerrymandering technique of "cracking," or spreading a party's supporters among multiple districts in which their preferred candidates lose by relatively small margins (Cox & Holden 2011). This technique only works if the cracked party's candidates actually lose. If they unexpectedly win, then a map that was intended to benefit the line-drawing party ends up assisting its adversary. The planned gerrymander inadvertently becomes a "dummymander" (Grofman & Brunell 2005).

Modified QV makes it more difficult for a mapmaker to predict the outcomes of district races, and so reduces the forecasting accuracy essential to gerrymandering. The policy has this consequence because a simple head count of each party's likely backers is no longer enough to determine how a district will perform. Rather, the head count must be combined with an assessment of the intensity of voters' preferences—a variable that is harder to measure *ex ante*, and that can change from election to election. Assume, for example, that a district is drawn so that 55% of its voters are Republicans and 45% are Democrats. Under ordinary plurality voting, this district, a classic case of cracking, will elect a Republican candidate unless there is a pro-Democratic shift of at least 5% (a relatively unlikely scenario). Under modified QV, on the other hand, it is hard to say whom the district will elect. If all voters feel about equally strongly and spend about the same number of credits, then a Republican will win. But if Democratic voters'

preferences are more intense, then a Democrat will prevail. And if it is Republican voters who are more passionate, then a race expected to be tight could turn into a landslide.

Accordingly, would-be gerrymanderers would be significantly constrained by the adoption of modified QV. It would become imprudent for them to design districts with narrow partisan majorities—which are optimal under plurality voting because they waste the most of the opposing party’s votes and the fewest of the favored party’s—due to the unacceptable risk that these districts would not perform as anticipated. This is not to say, though, that gerrymandering would be *eliminated* by modified QV. A party could still benefit itself by drawing a small number of districts in which its opponent’s voters are very heavily concentrated (say 90% to 10%) and a larger number of districts in which its own supporters are more efficiently distributed (say 70% to 30%). Even given variations in the intensity of voters’ preferences, these districts’ supermajorities would likely be able to elect their preferred candidates, with bigger margins of victory in the former group than in the latter. But even if this is correct (which is not certain⁸), the severity of gerrymandering would be lower than is currently observed. A party simply cannot advantage itself to the same extent once narrowly cracked districts are removed as an option.

A related benefit under modified QV is that electoral competitiveness might increase. At present, the vast majority of American elections are highly uncompetitive. At the state legislative level, for instance, only about 10% of races are decided by fewer than 10 percentage points, and about 95% of incumbents are reelected (Klarner & Evans 2015). Modified QV could improve both of these figures by making it more uncertain how any race would turn out. As noted above, a district with a 55% to 45% partisan makeup could easily elect the minority’s preferred candidate if the minority is particularly motivated. Similarly, a district with a lopsided partisan breakdown could produce a close race if the minority is energized and the majority is apathetic.

Of course, these forces may operate in the opposite direction too. If the majority’s preferences are more intense than the minority’s, races that might be expected to be tight, based on partisan composition, could become blowouts instead. Likewise, safe districts could become safer still. It is therefore premature to predict that modified QV would necessarily make American elections more competitive. The better forecast is that it would them more *unpredictable*—with actual outcomes sometimes being closer than under plurality voting, and sometimes further apart.

We should add that QV exposes, in this context and others, the difficulty of evaluating election laws using the usual legal and policy criteria. In a well-designed QV system, people would have very strong incentives to participate because (in our simple design) election day occurs once every two years, with all (or most) offices up for grabs. Citizens who care at all about political outcomes will come to the polls; they can use all their credits to support someone they care about, or divide them as they see fit. It also seems likely that the competitiveness of each race would increase because, even in safe districts, people who support the obvious winner will not waste all their credits on that person. This is not inherently good or bad; it is just a feature of the system. Meanwhile, participation in each race should increase (because one can

⁸ The problem for the line-drawer is that as the gerrymander becomes more extreme, the minority in the district will have a stronger incentive to expend credits for its favored candidate. This adds to the cost of gerrymandering under QV.

cast fractional votes in unimportant races) and participation across all races should rise dramatically.

C. Voting Rights Act

An area of election law related to redistricting is minority vote dilution, which refers to electoral practices (often the setting of district lines) that do not disenfranchise anyone but still result in fewer minority-preferred candidates being elected. The Voting Rights Act (VRA) bans vote dilution, and under certain circumstances requires the imposition of remedies that enable minority voters to elect the candidates of their choice (Stephanopoulos 2016). By far the most common VRA remedy is the majority-minority district, a district drawn so that minority voters make up at least 50% of the population. Reformers also often advocate alternative remedies such as multimember districts with cumulative or preferential voting (Stephanopoulos 2013).

Modified QV has mixed implications for the usual VRA remedy. On the one hand, if the policy is in effect, it might be less necessary to craft districts in which minority voters constitute an outright *majority*. If these voters have relatively intense preferences, they could elect their preferred candidates even in districts where they are outnumbered by white voters. Take a district that is 40% minority and 60% white and in which there is high racial polarization in voting. Under plurality voting, it would be unlikely that this district would elect a minority candidate of choice. But under modified QV, this outcome is quite possible; all that is needed is for minority voters to spend somewhat more of their credits than white voters. The policy could thus allow lines to be drawn in a less race-conscious manner, with not as much riding on the presence or absence of majority-minority districts.

On the other hand, if it is usually *white* voters whose preferences are more intense, then bare majority-minority districts would be defective remedies under modified QV. Despite their numerical predominance, the less engaged minority voters would be outvoted by their more animated white peers. Under these conditions, the policy could therefore require a return to something like the old “65% rule,” under which remedial districts with minority populations above 65% had to be drawn to compensate for minorities’ lower eligibility and turnout rates (*United Jewish Orgs. v. Carey* 1977).⁹ It is an empirical question, of course, whether minority or white voters typically have more intense preferences, and so whether bare majority-minority districts are excessive or inadequate remedies.

As for the multimember districts favored by reformers, modified QV presents a familiar set of advantages and disadvantages relative to cumulative or preferential voting. On the positive side, because the policy enables voters to make tradeoffs not just among candidates but also among races, it permits more complex preferences to be conveyed. Under the right circumstances (namely, strong minority preferences and high racial polarization), it also results in the election of more minority-preferred candidates than cumulative or preferential voting,

⁹ However, even if minorities are unable to elect their *most* preferred candidate in a given district, modified QV may enable them to prevent their *least* preferred candidate from being elected. Minorities could credibly threaten to cast many more votes to oppose, say, a racist candidate. And this point is generalizable: Because extreme candidates may be expected to provoke more intense opposition, modified QV should benefit more moderate candidates, even if they do not belong to certain voters’ race or party of choice.

whose ceiling is proportionality. Less sunnily, the representational *floor* of modified QV is lower than that of cumulative or preferential voting. Even if minority voters reliably back minority candidates under the policy, fewer of the candidates will be elected if the voters fail to spend many credits on them. In contrast, under cumulative or preferential voting, the intensity of minority voters' support is immaterial. All they have to do is follow the right strategy (casting all votes for minority candidates under cumulative voting, ranking minority candidates highest under preferential voting) no matter how strongly they feel.

This uncertainty reflects in part the ambiguity of the VRA's goals. Suppose that the purpose of the VRA is simply to increase the number of minority elected officials. Modified QV would yield more of them than plurality voting if and only if minority (or other) voters intensely prefer minority candidates while white (or other) voters weakly prefer other candidates. On the other hand, if the VRA's aim is to improve policy outcomes for minority voters, then modified QV is superior to plurality voting simply because it produces more efficient outcomes overall (at least as long as this efficiency gain is not offset by negative distributive effects). Modified QV thus highlights the tension between the VRA's objectives of descriptive and substantive representation (Stephanopoulos 2016).

D. Campaign Finance

Turning next to money in politics, we briefly consider how it might be affected by modified QV (a topic one of us has already addressed in previous work (Posner & Weyl 2015)). We then evaluate a system of QV-based campaign finance, in which campaign contributions and expenditures are taxed quadratically. The latter policy would have more sweeping consequences, but its constitutionality is also less clear.

The principal impact of modified QV would be to change the goal of the money that is spent trying to influence voters. At present, this aim is to convince voters to cast their lone ballot either for or against a given candidate. Because most voters today are partisans (Pew 2015), the bulk of spending is directed at the small number of undecideds whose votes are plausibly in play. Under modified QV, in contrast, there would be little point in trying to sway voters who are having trouble making up their minds. Even if these voters were persuaded, their preferences would likely be weak, and so they would probably cast only a small number of votes. Instead, the key would be to induce voters already leaning in a candidate's direction to grow significantly more partial toward him. If this inducement was successful, then these voters might cast *many* more votes for him. Thus driving up the intensity of the base, not seeking to win over the mushy middle, would become the focus of campaign spending.

To be somewhat more precise, all equally sized changes in voter intensity are equally valuable under modified QV, whether they occur among a candidate's supporters, his opponents, or undecided voters. Large changes in intensity seem less likely among undecided voters, and more likely among a candidate's existing backers (or adversaries). This is why appeals to the base (as well as efforts to quell the passion of the other side's core voters) would probably become more prevalent under modified QV.

Now imagine a system of QV-based campaign finance—layered over either our current regime of plurality voting or modified QV. Under this system, people may both *donate* as much money as they want to candidates, and independently *spend* any sum in support of them. However, only the square root of the amount that they donate or spend, multiplied by an amount set to make the system as a whole budget-neutral, would actually be deployed. The rest of the money would enter the public Treasury. Assume, for example, that a multiplier of 10 would make the system budget-neutral. Then if a person donated \$1 to Bernie Sanders, his campaign would receive \$10 ($(\$1^{.5}) \times 10$). Similarly, if a person wanted to independently spend \$10,000 to back Donald Trump (or if Trump wanted to spend \$10,000 on his own candidacy), \$1000 could be used on commercials, mailers, and the like ($(\$10,000^{.5}) \times 10$), and the other \$9000 would go to the government.

The justification for QV-based campaign finance is the same as the justification for QV-based voting. People would be able to influence election outcomes through donations and spending only in proportion to the intensity of their interests as reflected in money. Of course, QV-based campaign finance would improve outcomes only to the extent that donations and spending *affect* outcomes, but that is widely (though not necessarily correctly) thought to be the case. It's also worth noting the interesting shift in perspectives here. While pure QV-based voting (superficially) appears to disadvantage the poor because they have less money, QV-based campaign finance seems to disadvantage the rich because the effective tax on their activity is higher if (as would normally be the case) they want to donate and spend more than the poor do. Both of these impressions reveal the strangeness of our current system, which is strictly egalitarian for voting but completely plutocratic for donating and spending. QV is less egalitarian than our current voting system but more egalitarian than our campaign finance regime.

An additional point in favor of QV-based campaign finance is the multiplier that makes the system as a whole budget-neutral. Thanks to this multiplier, small contributions and expenditures are significantly *augmented*, thus incentivizing the less wealthy to supply more campaign funding—and candidates to seek their money instead of just that of the rich. On the other hand, donating and spending on a large scale are taxed at an ever increasing rate, which is beneficial as well. Because of this property, the rich would face a rising marginal cost as they tried to exert more financial influence. The multiplier thus produces an appealing combination of public financing for small contributions and expenditures, fully paid for by a quadratic tax on large ones.¹⁰

Would this system be constitutional? The courts have held that both contribution and expenditure limits burden the First Amendment right to engage in political speech, and that the imposition is worse in the case of expenditure limits (*Buckley v. Valeo* 1976). Accordingly, both types of policies must be tailored to promote significant state interests, and the level of scrutiny is higher for expenditure limits. Contribution limits need only be “closely drawn” to serve a “sufficiently important interest” (*Nixon v. Shrink Mo. Gov't PAC* 2000, at 387-88), while expenditure limits are subject to “exacting scrutiny” (*Buckley v. Valeo* 1976, at 44-45). The only rationale for regulation thus far recognized by the Court is the prevention of corruption and its appearance, with corruption defined narrowly as a quid pro quo exchange (*McCutcheon v. FEC*

¹⁰ The cutoff between public financing and taxing would be located at the square of the multiplier. With a multiplier of 10, for example, a \$100 donation would result in \$100 going to the campaign ($(\$100^{.5}) \times 10$).

2014). The Court has repeatedly rejected egalitarian interests, whether involving equality of candidate spending (*Ariz. Free Enter. Club's Freedom Club PAC v. Bennett* 2011) or of voter influence (*Buckley v. Valeo* 1976). However, the Court has also held that public financing is generally constitutional (*Buckley v. Valeo* 1976).

Under this framework, QV-based campaign finance imposes a First Amendment burden on certain individuals. Specifically, people who want to donate or independently spend an amount in excess of the square of the multiplier will be able to put fewer funds to use with QV than without. QV effectively operates as a tax on larger-scale campaign financing, with its level rising as the sum of money to be given or spent increases. However, QV is arguably less burdensome than more conventional caps on contributions or expenditures (like the \$2700 donation limit currently in effect for federal elections). These measures *prohibit* giving or spending beyond a certain threshold, while QV merely taxes it at a higher rate. QV also subsidizes smaller-scale campaign financing, thus eliminating any possible imposition on people whose activity is relatively limited. On the other hand, the QV tax applies to *all* dollar amounts above the square of the multiplier, even ones below the current legal threshold (which caps tax at a 0% rate). How speech-restrictive QV is deemed thus depends on how a lower tax at above-threshold levels is weighed against a higher tax at certain below-threshold levels.

Turning to the state interest for QV-based campaign finance, it is the same as for the usual form of QV: improving collective decision-making by causing it to reflect the intensity of people's preferences.¹¹ This interest is obviously important, at least as significant as the prevention of corruption. It also has not been rejected by the Court, as optimizing decision-making is quite different from equalizing candidate spending or voter influence. However, it is unclear to what extent the interest is actually served by quadratically taxing campaign contributions and expenditures. Doing so may ensure that the amount of money in politics corresponds to the strength of people's preferences—but the amount of money in politics does not actually decide any issue. Voters do not always prefer the better-funded candidate, nor do representatives always side with whoever more generously supported their campaigns. More money may be *correlated* with desired outcomes, but it does not *guarantee* them the way that more votes do.

Accordingly, the constitutionality of QV-based campaign finance is a close call. The First Amendment burden it imposes is comparable to that of conventional ceilings on donating and spending, meaning that it requires a similarly compelling state interest that it is similarly tailored to promote. Improving collective decision-making *is* a similarly compelling interest, but it may not be advanced enough by QV-based campaign finance to establish the policy's lawfulness. Because money is merely an input into collective decision-making, rather than the unit on whose basis decisions are made, it may not ultimately matter whether campaign funds come to reflect the intensity of people's preferences. Even if they do, citizens' and representatives' votes still may not.

We note, though, that there is one variant of QV-based campaign finance that is almost certainly constitutional. This is using public funds to provide vouchers to citizens (Ackerman &

¹¹ As noted above, a secondary interest advanced by QV-based campaign finance is incentivizing small donations and expenditures, which are augmented by the multiplier.

Ayres 2002), which the citizens could then allocate to candidates on a quadratic basis, as first advocated by Hasen (1996). For example, all citizens might be given 1000 credits per election cycle, which they could then convert into contributions quadratically (1 credit for a 1 dollar donation, 25 credits for a 5 dollar donation, and so on). This policy would be lawful because it does not restrict anyone's ability to give or spend her *own* money. It only creates a quadratic relationship for the translation of *publicly* supplied credits into contributions. It is well-established that the government can attach conditions to campaign funds that it makes available (*Buckley v. Valeo* 1976), and a quadratic conversion formula fits comfortably within this line of precedent.

D. Primary Regulation

Primary elections are used in almost every state to select the party nominees who then compete in the general election. There are several kinds of primaries: open primaries in which voters of any affiliation may participate; closed primaries in which only voters registered with a party may participate; top-two primaries in which all voters may select among all candidates, and the top two vote-getters then advance to the general election; and so on (FairVote 2016). Parties have almost complete discretion in choosing among these primary types. Any effort by the state to compel a party to use a primary type to which the party objects is likely to be deemed an unconstitutional violation of the party's First Amendment right to political association (*Cal. Dem. Party v. Jones* 2000). However, there is no constitutional entitlement to a state-organized primary in the first place. A state may decide to scrap its primary and conduct only a general election (*Wash. State Grange v. Wash. State Rep. Party* 2008).

If modified QV were adopted in a primary (at a party's request), the policy could have a range of positive consequences. First, it might reduce the odds of "wrong winner" outcomes, where the winning candidate is opposed by a majority of voters. These outcomes are common in fragmented multicandidate races under plurality voting,¹² but they are less likely if voters can express the intensity and order of their preferences—rather than just the identity of their top choice. Second, modified QV could lower the stakes of debates over who may participate in primaries, which currently prompts a good deal of litigation. At present, parties fear (and reformers hope) that if non-party members are allowed to take part, they may affect who wins the nomination. But if we assume that party members have stronger preferences than non-party members as to who should carry the party's banner in the general election, then this concern dissipates. The involvement of the non-party members would not greatly influence the primary results.

More radically, modified QV makes possible the elimination of primaries altogether. Primaries are needed in a world of plurality voting to prevent wrong-winner outcomes in general elections. Unless a party is able to winnow its field of candidates to a single nominee, it risks dividing its vote and then losing the election. But as noted above, this worry of splitting the vote and so allowing the "wrong" candidate to win is relieved under modified QV. When voters can support or oppose multiple candidates, and to different degrees, the probability plummets that the

¹² For example, assume that Donald Trump wins 40% of the vote in a primary, Ted Cruz wins 35%, and Marco Rubio wins 25%, but that Rubio would beat either Trump or Cruz in a head-to-head matchup. Then Trump prevails even though a majority of voters prefer Rubio.

winning candidate will be an inefficient choice. Voters are able to prevent this result by voting not only for their top-choice candidate (e.g., a co-partisan unlikely to win), but also for their second preference (e.g., a more viable co-partisan) and *against* their worst option (e.g., the most popular candidate of the opposing party). These kinds of complex preferences cannot be expressed under plurality voting, thus necessitating a two-tiered system with a primary followed by a general election. But when voters can both calibrate and order their choices, only a single electoral stage is required.

E. Franchise Access

The final area we examine is access to the franchise, or how the right to vote is and may be limited. State election codes pervasively regulate franchise access, specifying, among other things, who may register to vote and when, whether early or absentee voting is permitted, where polling places are located, and how voters' identities are validated. When these policies are challenged, their constitutionality is assessed using the framework of sliding-scale scrutiny described above. The more severe a burden on the right to vote a measure is found to impose, the more important the interest advanced by the measure must be, and the more tailored the measure must be to promote this interest (*Burdick v. Takushi* 1992).

From roughly the 1960s to the 2000s, it became progressively easier for people to register and vote. Jim Crow restrictions like literacy tests and poll taxes disappeared thanks to the VRA and cases like *Harper*; many states adopted early or absentee voting; and the National Voter Registration Act required voter registration to be offered to people applying for driver's licenses. But over the last decade or so, new limits on the right to vote have proliferated. Many states have enacted photo identification requirements for voting, proof-of-citizenship requirements for registering to vote, cutbacks to early voting, and the like (Brennan Ctr. 2016). Most of these policies have been upheld in litigation; the Supreme Court, notably, sustained a photo ID requirement against a facial constitutional challenge (*Crawford v. Marion Cty. Elec. Bd.* 2008). Plaintiffs have enjoyed some success, though, bringing claims under the Voting Rights Act, state law claims, and constitutional claims limited to specific sets of plaintiffs.

Photo ID requirements exemplify the current debate. These laws are putatively aimed at preventing voter fraud—a legitimate state interest. However, critics argue that the actual motivation of the mainly Republican legislators who enacted the laws was to deter voting by low-income people—mainly Democratic voters—who did not have the wherewithal to obtain a driver's license or other approved means of identification. The critics also point out that voter fraud is in fact exceedingly rare. One of the ironies of our current system is that because voters do not gain materially by voting—the probability of being pivotal is too remote—they have little incentive to vote fraudulently. The type of person who votes generally does so out of civic duty.

Under modified QV a voter has a greater effect on political outcomes; therefore, the incentive to engage in voter fraud is stronger too. Modified QV also requires more elaborate tracking and record-keeping of voters, so that their budget of credits is properly maintained. For these reasons, identification requirements would likely be a more important part of modified QV than of the current system. It would continue to be important, however, for courts to guard

against attempts by legislatures to impose onerous identification requirements that disenfranchise the poor.

An additional point is that modified QV could counteract the turnout-dampening effects of the recent wave of franchise restrictions. The common theme of these laws is that they raise the costs of voting: by requiring citizens to obtain documentation before registering or voting, by making it harder to vote early or absentee, and so on. Modified QV, on the other hand, increases the *benefits* of voting, by enabling voters to exert more influence on a larger number of races. For citizens on the cusp of voting, who may be discouraged from participating by the new restrictions, modified QV could helpfully nudge them toward going to the polls. They would still have to comply with the restrictions, but now the impact of their ballot would be greater.

Conclusion

In previous work, one of us has argued that the alignment of policy outputs with the preferences of the median voter should be the overarching goal of election law (Stephanopoulos 2014; Stephanopoulos 2015). Alignment with the median voter is certainly preferable to what we see today, which is all too often alignment with the median *donor* or alignment with the median member of the gerrymandering party. But alignment with the median voter has a significant drawback as well: while the median voter necessarily represents the views of a numerical majority, her position does *not* always maximize aggregate utility. This is because people vary in the intensity of their preferences, meaning that utility is sometimes maximized by siding with a passionate minority rather than a less motivated majority.

The appeal of quadratic voting is that it allows election law to set a more ambitious target than median voter alignment: namely, the achievement of efficient election and policy outcomes, or *mean* voter alignment. Unique among voting systems, QV makes this aim realizable by causing the marginal cost of voting to rise linearly as more votes are purchased. Voters then cast the number of votes that equalizes their marginal cost and benefit and so optimizes their personal utility. To be sure, the pure form of QV is probably unconstitutional, thus barring tradeoffs between private and public goods and preventing true utility maximization. But even modified QV, which permits tradeoffs among public goods only, constitutes an important step forward. It captures all of the utility gains that are possible while treating voters with formal equality. It also has an array of positive collateral consequences ranging from the disabling of gerrymandering to the dilution of the electoral influence of the wealthy. These benefits make it a policy well worth trying.

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