

Interests/preferences, equality/efficiency.

Historical notes on Quadratic Voting

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Abstract: Ancient Greek and contemporary political thought draws attention to the connections between the equality of moral standing among citizens and systems of voting, and to the relationship between assumptions about equality or inequality of standing to the bases of desert and the distribution of influence in a democratic state. These issues in turn bear directly on the bases of democratic legitimacy. Applying QV to the domain of political decision-making in a democracy risks undermining democratic legitimacy. The costs of system-threatening civil conflict attendant upon delegitimation may outweigh efficiency gains within the system.

In this short paper I offer a brief discussion of the classical Greek prehistory of the idea of “two kinds of equality,” based on the still-fundamental paper of F.D. Harvey (1965). I raise a few concerns, drawn from classical and contemporary political theory, about the application of Quadratic Voting (QV) to the political domain – that is, to voting by citizens of a democratic state, either for representatives or in referenda, as discussed in Posner and Weyl 2015: “Voting Squared: Quadratic Voting in Democratic Politics.” My concerns are directed to the strong form of “political QV,” in which quadratic vote-buying would employ voters’ own real money, rather than some sort of proxy currency distributed according to some notional political principle. None of these objections bears on the value of QV as a contribution to decision theory, and none of my concerns relate to the use of QV in corporate governance (Posner and Weyl 2014: “Quadratic Voting as Efficient Corporate Governance”), or to other non-political (in the ordinary sense) domains of decision.

In their 2014 paper (“Quadratic Voting”), Lalley and Weyl include, as an epigraph, a quotation from Aristotle’s *Politics* “(T)he will of those whose qualifications, when both sides are added up, are the greatest, should prevail” (Book VI, Part III).

Although the epigraph is decorative rather than substantive, in that it is not discussed in the body of the paper, it does point to the fact that arguments for theoretical and practical alternatives to 1P1V voting were developed in Greece of the fourth century BCE. The most prominent (at least in our existing sources) Greek theory went under the name “Geometric (as opposed to arithmetical) Equality”; call it GE. Like QV, the theory of GE had both a normative and a mathematical dimension: that is, GE was meant to address an issue of distributive justice (who ought to be the recipient of what resources or what powers, based on some notion of desert), and the expression of the normative idea was given a mathematical form. While, as Harvey (1965) has shown, Aristotle was not the originator of the theory of GE, it is in Aristotle’s *Politics* that it is most fully articulated.

Harvey (1965: 103) shows that GE can be traced back at least to the early fourth century BCE, to the Pythagorean philosopher Archytas of Tarentum, who refers to “three proportions in music:” the arithmetical, the geometric, and the harmonic. Archytas’ description of the first two of these “proportions” is worth citing in full:

The arithmetical is when there are three terms that stand in the following relation to one another in proportion: the first exceeds the second by the same amount as the second exceeds the third (e.g. 6, 4, and 2, where $6 - 4 = 2$). And in this proportion, it is the case that the ratio between the larger terms is smaller, and that between the smaller is greater (i.e. $6 = 1.5 \times 4$, but $4 = 2 \times 2$, a greater ratio). The geometric is when the first stands in the same relation to the second as the second to the third (e.g. 8, 4, 2, where $8:4::4:2$) And of these the greater are in the same ratio as the smaller (i.e. $8 = 2 \times 4$, $4 = 2 \times 2$). (transl. Harvey, adapted).

As Harvey showed (1965:104), Archytas (probably), and Plato, Aristotle and other fourth-century BCE Greek political philosophers (certainly), applied this musical “proportionality” theory to politics. The arithmetical proportion was seen by them as applicable to and the standard principle behind, democracy, in which 1P1V was the normal method of decision-making. The normative justification of the arithmetical proportion in ancient Greek democratic political theory (insofar as it can be reconstructed) was the idea of political equality – each citizen was taken to be the moral equal of each other citizen, and thus his (only men were citizens) chance to have an influence on public affairs, expressed in a vote (or a chance in a lottery for public offices, based on random selection) should likewise be the same as that of every other citizen. So: equality of moral standing among citizens in a democracy = 1P1V.

Equality was, in classical Greece (and of course still is) a very powerful and pervasive normative idea: Plato, in the *Republic*, among others asserted that justice is a kind of equality. But the ancient Greek critics of democracy, including Plato and Aristotle, asserted that the democratic conception of equality as equal moral worth among citizens (and thus the majority decision rule predicated on 1P1V) was only one way to look at the issue of desert, and thus, in the political domain, the question of the appropriate distribution of political influence among persons. Moreover, they claimed that equality of moral worth, and thus equality of political influence, was the wrong way to think about it, if and when some people could legitimately claim to be superior, in morally relevant ways, to others. For these critics of democracy, the primary error of democrats was to assume equal moral worth among citizens. Where some are superior, so too should some people's influence be greater.

In any real-world society, the philosophical critics of Greek democracy argued, some people actually are better, more worthy, than others. Their worth might be gauged by various criteria. Aristocratic birthright, wealth, and virtue were the usual differentia. Rather than assert that equality was simply a bad idea, democracy's ancient critics claimed that democrats were committed to the wrong kind of equality. In a truly equal system, they argued, influence (in the political domain) would be distributed, not according to the per capita "arithmetical" principle, but according to the principle of merit: In order to achieve true (merit-based) equality, more worthy (higher born, richer, more virtuous) persons would be accorded proportionally more influence in public affairs.

But how much more influence? Here is where the geometric musical proportion came into play, to provide a mathematical underpinning to what would otherwise be hopelessly subjective judgments about the relationship of worth to influence. And thus was born the theory of GE, as we find it worked out in Aristotle's *Politics*.

It seems, on the face of it, that the ancient theory of GE and the contemporary theory of QV, have some features in common: As noted above, each theory has a normative motivation and a mathematical expression. Obviously the math is quite different - in GE the increase in influence is not quadratic, and there is no reason to believe that GE had a sophisticated algebraic proof sitting behind it. But more saliently, to my purposes in this paper, the normative intuition seems very different.

The Greek originators and propagators of GE were motivated by the belief that some people are, in morally relevant ways, "better" than other people, and these superior persons deserved, as a matter of equity, to have a proportionately greater influence on public affairs. I find no such normative assumption about the inherent moral

superiority of some persons in QV. Indeed, the primary example of political QV offered, gay marriage, seems to imply a commitment to the fundamental equality of moral standing of persons: i.e. that marriage is a good that ought to be distributed equally to all persons, not restricted to a heterosexual minority. I take it that one goal of QV (in the political domain) is to enable those with equal moral standing, but who have been (through the political process) denied an equal distribution of some good (say, marriage), to effect a change in the (morally indefensible, because treating moral equals unequally) rules.

The proposal to apply QV to the political domain suggests that normatively choice-worthy changes in the law could be effected through the democratic process of voting on the basis of intensity of preferences. Implicitly, this is a better way to go than having to rely on some extra-democratic judicial authority, for example a court with the right moral standards – as in the legal theory of Ronald Dworkin (1986). So, QV may be seen as seeking to express both a commitment to democracy (as opposed to judicial activism) and a belief in the possibility of democratically promoting fair outcomes, with fairness being predicated on the assumed equality of moral standing among persons. The fair outcome, which could not be readily achieved through a 1P1V vote, is made possible by the quadratic vote process, the choice-worthy outcome is made possible by the unequal political influence that arises from a system that respects preference intensity.

The question is, however, whether unequal political influence (as advocated by application of QV to politics) can readily be accommodated within an existing democratic regime, i.e. without undermining the bases of democratic legitimacy. The Greek originators of GE embraced unequal political influence because they rejected equality of moral standing, and they meant to throw out democracy in favor of a political system that they regarded as better. So undermining democratic legitimacy was their explicit goal. Can political QV, by way of contrast, be accommodated as a “friendly amendment” to an existing democratic regime, like that of the USA? Or does political QV entail throwing out democracy and replacing it with some other form of government? I reiterate that I do not think that the originators of QV make the kind of assumptions about inherent superiority of persons that led the Greek originators of GE to happily contemplate anti-democratic revolution. But the result of applying QV to democratic politics might, I suggest, be to delegitimize democracy.

If Harvey is right, as I think he is, Aristotle had the concept of “two kind of equality,” along with its mathematical expression per Archytas’ musical theory, in mind throughout his discussion of democracy and oligarchy in the *Politics*. The

mathematical underpinning comes through most clearly in one extended passage. Again, it is worth quoting in full (*Politics* 5.1301b27-1302b8):

For civil conflict (stasis) is everywhere due to inequality, where classes that are unequal do not receive a share of power in proportion (for a lifelong monarchy is an unequal feature when it exists among equals); for generally the motive for factional strife is the desire for equality. But equality is of two kinds, numerical equality and equality according to worth—by numerically equal I mean that which is the same and equal in number or dimension, by equal according to worth that which is equal by proportion; for instance numerically 3 exceeds 2 and 2 exceeds 1 by an equal amount, but by proportion 4 exceeds 2 and 2 exceeds 1 equally, since 2 and 1 are equal parts of 4 and 2, both being halves.

But although men agree that the absolutely just is what is according to worth, they disagree (as was said before) in that some think that if they are equal in something they are wholly equal, and others claim that if they are unequal in something they deserve an unequal share of all things. *Owing to this, two principal varieties of constitution come into existence, democracy and oligarchy; for noble birth and virtue are found in few men, but the qualifications specified [humanity, wealth] in more: nowhere are there a hundred men nobly born and good, but there are rich men in many places. But for the constitution to be framed absolutely and entirely according to either kind of equality is bad. And this is proved by experience, for not one of the constitutions formed on such lines is permanent. And the cause of this is that it is impossible for some evil not to occur ultimately from the first and initial error that has been made. Hence the proper course is to employ numerical [arithmetical] equality in some things and equality according to worth [GE] in others.* (transl. Rackham, adapted).

There are a few things in this passage that seem relevant to the application of QV to modern political decision-making; the most relevant phrases are italicized. Aristotle (like Archytas and Plato: Harvey 1965: 118 n. 65) associated conflicting ideas about equality and desert with civil conflict. Greek city-states (like some modern states) were endemically at risk of violent civil strife. There was, therefore, a lot at stake in getting distributional principles and mechanisms right – with right, here, being the principle and mechanism that would distribute political influence in a way that would best promote long-term regime stability -- i.e. fend off the tendency to fight of those who believed they were being treated unfairly (unequally according to their own lights). Aristotle advocated a mix of arithmetical and GE approaches to the distribution of political influence. His arguments were grounded both in theory (his

philosophical preference for “middle” and “mixed” approaches, in various domains) and in empirics (his study of Greek revolutions and their causes: one of the primary topics of *Politics* book 5). In the *Politics*, Aristotle fails to provide his readers with a detailed institutional design for a stable regime. But, based on the passage cited above, he clearly believed that, if political stability is to be preserved within an existing democratic regime, GE might be applied to voting in certain contexts, but that arithmetical (1P1V) voting would need to be reserved for other contexts.

Suppose we postulate that Aristotle was right to worry about the politically destabilizing effects of contextually inappropriate application of “unequal influence” voting systems based on the second (inequality of moral worth, and thus of desert) kind of equality. Suppose further that his worries have some application to modernity. In that case, the relevance to QV of the ancient theory and practice of GE would seem to be that, if the legitimacy of a contemporary democratic regime is to be sustained, and if civil conflict is to be avoided, we should be carefully attentive to the contexts in which QV is applied. To paraphrase Aristotle, “the proper course is to employ QV in some things and 1P1V in others.” But in which things?

As noted above, Aristotle does not give his readers a great deal of guidance in actual institutional design, but he does have a useful discussion, in book 1 of the *Politics*, of the difference between common interests and factional preferences. While there is much in Aristotle’s discussion of interests and preferences that is not applicable to any conceivable modern regime, the basic idea is, I think, worth taking into account. In brief, his discussion allows us to conclude that preference intensity is not, or at least not always, the right criterion on which to base the kind of desert that is implied by inequality of political influence. Where preference is not the right criterion on which to base desert (and thus influence), QV, which is predicated on preference intensity as a legitimate basis for inequality of influence, is not the contextually appropriate decision mechanism.

Aristotle insists that, in any human community, there *are* common interests and that furthering those interests is essential for the flourishing of the community. Leaving aside his special definition of what flourishing entails, that seems to me (and to many other political theorists) a plausible claim. If we say that common interests include certain sorts of public goods -- say, at a minimum, internal and external security -- then we might have a preliminary basis for a decision context in which QV is not applicable. If we take security to be a non-rival and non-excludable public good, in which each citizen has the same interest (by making the egalitarian assumption that avoiding death or violent harm is of equal value to each citizen), then decisions about security would seem to be outside the realm of the sorts of

things that QV, with its focus on differential intensity of preferences, is well suited to address.

The security/interests context might be generalized to the domain of democratic politics, if we accept Aristotle's basic argument about the dangers of civil conflict that can arise from disagreement about kinds of equality, and thus about where and when inequality of influence is legitimate. In sum, my central concern about the application of QV to the domain of politics (as opposed to, e.g., corporate governance) is that, by making preference intensity the standard of desert in political matters it would undermine the basis of democratic legitimacy (equal moral standing among citizens), and thus would be likely to lead to more civil conflict and ultimately to violent strife among citizens. My core claims, then, are that (1) democracy is legitimate and thus stable only when citizens are reliably regarded, by one another but especially by the law, as equal in moral standing, and (2) equality of moral standing is expressed most clearly and explicitly in 1P1V. Democrats and their opponents have been convinced of those two claims since the fourth century BCE, and I think they had, and have, good reason to believe them to be true.

Rightly noting that vote-buying is illegal in democracies, and indeed, taboo, Posner and Weyl (2015: 50), are "painfully aware" that "any suggestion that vote-buying should be legalized will be met with incredulity." But they suppose that, once the source of the taboo is understood, it will be seen as inapplicable to QV. Their argument is that vote-buying under QV will have good outcomes, in contrast to the bad outcomes of ordinary vote-buying (usually called corruption) in democracies. They point out that (2015: 50), "under QV it would still be necessary to outlaw extra-system vote buying that could be used to undermine the quadratic nature of costs by allowing one individual to buy votes as a proxy for another." My concern, as noted above, is not about efficient outcomes, but about the source of democratic legitimacy: once buying votes is legitimized in law, then the idea of equal moral standing of persons, and desert as equal interest in certain fundamental public goods, seems also to be at risk. Moreover, per below, I do not see how the ban on "extra-system vote buying" could be sustained, once the taboo against vote-buying has been shown to be inapplicable in the public domain.

Posner and Weyl (2015:51) note that "vote-buying is permitted in the corporate setting, which suggests that the prohibition on vote-buying does not reflect some intrinsic moral constraint but instead advances specific institutional values that vary by context." Indeed, none of the concerns I have raised above are relevant to the domain of corporate governance. While I am inexpert in corporate law,

corporate governance seems, on the face of it, an entirely appropriate context for QV. The reason is precisely because there is no “moral constraint” in this context. Corporate governance raises no very obvious issue of common (to the citizens of a state) interests that would be meaningfully similar to state security. The flourishing or failure of a corporation is of course of concern to workers and those worried about a local tax base. But the corporation is owned by shareholders, and their ownership stake is determined by the number of shares owned. Equality of moral standing of persons does not come into it. Desert (thus legitimate influence) in the case of corporate governance seems self-evidently to be determined with reference to share-ownership and the preferences of share-owners. Voting that expresses intensity of shareholder preference by being somehow (per share or via QV) linked to the quantity of shares owned raises no moral quandaries. There is no worry here about a second kind of equality, no background normative issue of equality of moral worth.

Assuming, per above, that “the proper course is to employ QV in some things and 1P1V in others,” corporate governance seems indeed to be the sort of context in which QV makes sense. But I do not think the goodness of fit of QV to corporate governance offers a reason to think that QV is an equivalently good fit in the public domain, or that the irrelevance of the taboo against vote buying in corporate governance is in any way relevant to the taboo against vote buying in the domain of politics (Posner and Weyl 2015: 50-51). The taboo against vote buying in the political domain arises, if I am right, because the taboo is necessary to sustain the legitimacy of the democratic regime. Even if most Americans really understood how corporate governance worked, I do not think they would in it a good reason to believe that vote buying in the political domain was a fair way to go. And, in the real world of actual states (as opposed to ideal theories of justice proposed by political theorists and predicated on “hypothetical consent,” e.g. Rawls 1971), legitimacy does depend on whether or not most people actually accept the system as basically fair.

I briefly raise two other issues. First, per above, if the taboo against vote buying is set aside, and so political vote-buying is seen as legitimate within the system of QV, why should (and why will) people respect the government’s monopoly in the vote market? Votes that can be bought have monetary value; that is explicit in both the quadratic vote-selling process and in the pro rata return to voters of the money spent on votes. It seems obvious enough on the face of it that a natural market for votes will quickly emerge within a QV system: Once the marginal price of another vote by A reaches the level at which B is willing to sell his vote, why should B not sell his vote to A? Given that the cost of votes in a highly contested quadratic election

could go very high, there is every reason to suppose that efforts by a coercive government to forbid extra-system vote buying will be met with inventive (say, dark internet) systems for vote selling. Extra-system vote-buyers and vote-sellers know that vote-buying is non-taboo. Extra-system vote buying and selling is illegal, but the law, they may reasonably feel, has no normative force. After all, why should the government have a monopoly in this market as opposed to other markets for goods and services? Judges may agree with them, and move to legalize extra-system vote markets. And at this point, I presume, the intended purposes of QV will be defeated, and the voting system corrupted.

My final concern is that political QV could become a high, and vicious, tax on small and wealthy minorities. Suppose that the QV system is well entrenched and the concerns, above, about extra-system markets in voting prove irrelevant. Suppose, further, that in a given democracy there is an identifiable minority of persons, known to be, per capita, relatively wealthy. Suppose now that this rich minority is subject to prejudice on the part of the relatively poor majority. The current rules protect the minority from the hostility of the majority. But under QV, the hostile majority may see fit to launch a legislative attack (via opportunistic representatives or referenda) on the minority. The legislation proposed might, eventually, be knocked down in the courts, but then it might not. The small minority responds quadratically to the attack, spending freely to defeat the prejudicial legislative initiative. The hostile majority loses the vote and pockets, pro rata, the income from the vote. Then they do it again. And again. At least until the resources of the minority have been exhausted (or they emigrate), the hostile legislation fails to pass due to quadratic voting by the minority. But the minority is subject to what amounts to a tax. Both the method by which the tax is levied and its motivation seem morally indefensible, and likely to further erode the idea of the legitimacy of democratic process. Of course the minority may also be attacked under 1P1V, but quadratic voting seems to give a perverse monetary incentive to the hostile majority to keep up their attacks rather than giving up the first time the hostile legislation is slapped down by the courts. Opportunistic legislators, using the QV process, offer prejudiced voters a chance to continually “hurt their enemies and help their friends” – a definition of justice employed by some Greek aristocrats.

I conclude by reiterating that none of the concerns raised here is meant to cast doubt on the originality or importance of the QV as a decision theory, or as a method applicable to some important domains of real-world decision-making. My very incomplete historical survey was meant to draw attention to the connection between the equality of moral standing among citizens and systems of voting, and the relationship between that kind of equality to the bases of desert, and the

distribution of influence in a democratic state. These issues in turn bear directly on the question of the bases of democratic legitimacy. If applying QV to the domain of politics undermines democratic legitimacy, as I suppose that it could, then the costs of system-threatening civil conflict might quickly outweigh efficiency gains within the system.

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