The Vickrey-Clarke-Groves "Pivotal Mechanism" as an Alternative to Voting for Organizational Control

Yair Listokin*

Organizations with multiple stakeholders typically make decisions by following the will of the majority of some subset of stakeholders that are entitled to vote. This Article examines an alternative decision-making mechanism — the "pivotal" mechanism developed by Vickrey, Groves and Clarke. Unlike voting, the pivotal mechanism produces efficient outcomes in the presence of heterogeneous voter preferences. Moreover, the mechanism allows control rights to be allocated more widely, reducing the costs of opportunism when a controlling class of stakeholders has interests adverse to another class. These benefits come with costs. The pivotal mechanism's efficiency diminishes in the presence of collusion between voters and requires the creation of "pools" that disperse revenues created by the mechanism. The mechanism is therefore most attractive when the costs of heterogeneity are large and the risks of collusion are small. As a result, I propose the development of a legal basis for the pivotal mechanism as a menu option for organizational decision-making.

INTRODUCTION

Who makes the decisions and how do they do so? Much of organizational law is preoccupied with these questions. Generally, decision-making is bifurcated.

"Agents" of the organization make most decisions, but some other single class of "stakeholders," e.g. claimants to residual profits,[1] alumni,[2] or suppliers,[3] often has control over some critical decisions, such as the hiring or firing of the managerial agents. This class of stakeholders exercises control through some form of voting.

While voting has many virtues as a control mechanism, it also has many flaws. Voting cannot measure intensity of preferences.[4] If someone cares greatly about an issue but holds one vote, then that individual's preference is accorded no greater weight than another individual who holds a different preference with much less intensity. This makes the choice of a voting population critical. If a voting population for an organization is comprised of many individuals who care little about the organization, then these individuals may swing the vote in the direction of their slight preference, in spite of the fact that individuals with extremely strong preferences prefer an alternative direction.

For-profit business corporations mitigate these flaws of voting by implementing control via majority or plurality voting by claimants of residual profits (shareholders). Limiting voting to shareholders has the advantages of clearly defining the voting population and allocating control to a group with relatively homogeneous preferences for maximizing profits.[5] Voting by shareholders, however, also entails some inefficiencies. The control rights associated with voting are valuable to many parties other than claimants to residual profits. As a result, other patrons[6] may purchase shares and exercise the concomitant voting power to maximize their total interest rather than their interest as residual claimants exclusively. In other words, ensuring homogeneity of preferences among shareholders is tricky and expensive. Thus,

---

1   In a for-profit corporation.
2   In a university.
3   In a farm cooperative.
4   For a discussion of vote buying and selling as a solution to the inability of voting to measure intensity of preferences, see Saul Levmore, *Voting with Intensity*, 53 STAN. L. REV. 111 (2000).
5   Shareholders cannot be perfectly homogeneous. If they were, then all corporate votes would have unanimous outcomes, making voting pointless. Corporate voting makes sense only if there is some heterogeneity among shareholders, but not too much.
6   I use the terms "patron" and "stakeholder" interchangeably to refer to any party that transacts with an organization.

corporate law restricts "minority oppression,"[7] "coercive tender offers,"[8] and "vote buying,"[9] in which control rights are exercised to maximize interests other than corporate profit maximization. These restrictions are difficult to maintain, however, and many academics now decry the existence of empty voting, in which voting rights are decoupled from claims on residual profits through the use of derivatives.[10]

Even if all votes are cast with the intention of maximizing residual profits, voting exclusively by shareholders causes other inefficiencies. For example, the "asset substitution" problem[11] encourages corporations controlled by claimants to residual profits to take inefficient risks, since the upside of the risks are enjoyed by the residual claimants while the downsides are shared with the creditor class of patrons.[12] Similarly, some inefficient changes in corporate control may take place because control is vested with residual claimants to profits, who may ignore the surplus enjoyed by employees that will be destroyed by a change in control.[13] In both cases, the inability of voting to account for the interests of stakeholders other than residual claimants causes inefficiencies. To reduce these costs, other stakeholders may desire some measure of control of the corporation. Under current U.S. default law, however, obtaining such control requires the concomitant acquisition of a right to residual profits.[14] Because of risk aversion or capital constraints, stakeholders may view the costs of buying a dual right to control and residual profits prohibitive, even if a simple right to control is worth acquiring.

---

7   *See, e.g.*, Robert B. Thompson, *The Shareholder's Cause of Action for Oppression*, 48 Bus. Law. 699, 729 (1993).

8   *See* Eisenberg v. Chicago-Milwaukee Corp., 537 A.2d 1051 (Del. Ch. 1987) (finding a tender offer coercive).

9   *See* Chew v. Inverness Mgmt. Corp., 352 A.2d 426 (Del. Ch. 1976) (throwing out votes in a corporate election that looked to have been bought).

10   For a discussion of corporate voting pathologies, see Robert B. Thompson & Paul H. Edelman, *Corporate Voting*, 62 Vand. L. Rev. 129, 152-66 (2009), and the references therein.

11   For a discussion of the asset substitution problem, see *infra* Subsection III.B.3.

12   Michael C. Jensen & William H. Meckling, *Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure*, 3 J. Fin. Econ. 305 (1976).

13   *See* Andrei Shleifer & Lawrence H. Summers, *Breach of Trust in Hostile Takeovers*, *in* Corporate Takeovers: Causes and Consequences 33, 37-41 (Alan J. Auerbach ed., 1988).

14   The "one share one vote" rule implies that voting rights come with equivalent claims on residual profits. For a discussion of the rule, see Frank H. Easterbrook & Daniel R. Fischel, *Voting in Corporate Law*, 26 J.L. & Econ. 395, 408 (1983).

Voting is only one technology for exercising control, however. Therefore, these costs associated with voting are not inescapable. To mitigate the costs imposed by voting, I propose that organizational law should develop the Vickrey Clarke Groves (VCG) "pivotal" decision-making mechanism as an alternative to voting.[15] The pivotal mechanism provides a method for eliciting the efficient decision from a heterogeneous group of stakeholders by giving each stakeholder an incentive to truthfully reveal their valuation of different corporate decisions. The pivotal mechanism, developed by public-choice scholars in the 1970s and currently overlooked by organizational law, addresses many of the critiques of voting just presented, but introduces a different set of costs. As a result, I believe that organizational law should offer the VCG mechanism as a menu option for organizations and allow them to choose their preferred decision-making mechanism. At present, however, corporate codes such as the Delaware General Corporation Law assume that voting is the only technology for decision-making, referring repeatedly to voting and requiring the "election" of directors on an annual basis by stockholders.[16]

Economic theory demonstrates that the pivotal mechanism offers several advantages over voting as a decision-making mechanism for organizations. Under certain conditions, it can be shown that the pivotal mechanism will favor a decision if and only if the decision is efficient from a Kaldor-Hicks perspective. This is not the case with ordinary voting. The mechanism will therefore be most attractive to organizations wherein voting costs are particularly salient.

The Article proceeds as follows. Part I examines theories of organizational control and demonstrates how voting technology occupies a central place in these theories. Part II then develops the VCG pivotal mechanism as an alternative decision-making mechanism to voting. Part III demonstrates the pivotal mechanism's many advantages relative to voting, while Part IV examines costs associated with the pivotal mechanism relative to voting. The last Part concludes.

---

15 *See* William Vickrey, *Counterspeculation, Auctions, and Competitive Sealed Tenders*, 16 J. Fin. 8 (1961); Edward Clarke, *Multipart Pricing of Public Goods*, 11 Pub. Choice 17 (1971); Theodore Groves, *Incentives in Teams*, 41 Econometrica 617 (1973).

16 Del. Code Ann. tit. 8 § 211(b) (2010).

I. Organizational Decision-Making Mechanisms: The Prominence of Majority Voting

A. The Costs of Exercising Control via Voting

Henry Hansmann explains that organizations can transact with patrons of a firm in one of two ways — "contract" or control.[17] In a contractual relationship, a patron is guaranteed its contractual rights, but no more. In a control position, by contrast, a patron enjoys the ability to resolve any contractual gaps in its favor. Both control and contract entails significant costs, and each group of patrons has differing costs of transacting with the organization via contract or control. Hansmann, as well as Frank Easterbrook and Daniel Fischel, argues that contracts and control rights are allocated to minimize the total costs of patrons transacting with the organization.[18] This Article focuses on the costs of granting control rights to a group of patrons, such as shareholders, via voting. They include the opportunism that arises when those patrons' incentives conflict with the interests of other organizational stakeholders and the costs of collective decision-making.[19]

Granting control of the organization to any group of stakeholders entails costs. With control, patrons can take inefficient actions that accrue some benefit to the controlling patrons but impose even greater costs on other patrons. For example, shareholders may take actions that increase profits but impose even greater costs on employees or creditors. The separation between the effects of the decision and the right to make the decision thus creates inefficiencies.

Control rights mean nothing if they cannot be exercised. The class of patrons with control must have some method for implementing collective action. In practice, corporate law and commentators assume that voting is the only means of collective decision-making.[20] Majority voting is the default rule for most corporate decisions that must be made by vote, while plurality voting is the default rule for director elections.[21] Delaware corporate law

---

17 Henry Hansmann, The Ownership of Enterprise (1996) (explaining how organizational form evolves to minimize the sum of the costs of "transacting" via contract and the costs of transacting via control).

18 *See id.* ch. 1; Easterbrook & Fischel, *supra* note 14.

19 Hansmann, *supra* note 17, ch. 3.

20 *See* Del. Code Ann. tit. 8 § 216 (speaking of "the vote that shall be required for a certain action"). Proportional voting is also presumed to occur in nonstock corporations. *See id.* § 215; Professional Service Corporations, Del. Code Ann. tit. 8 § 612 (1953).

21 Del. Code Ann. tit. 8 §§ 216(2)-(3).

also explicitly recognizes the possibility of cumulative voting for directors.[22] Similarly, academic commentary on the allocation of power in organizations focuses exclusively on "voting schemes" rather than other collective choice mechanisms.[23]

Voting imposes several inefficiencies. First, voting is expensive and time-consuming, requiring many disparate parties to obtain knowledge about the problem at hand and make the effort to vote. In large voting pools, individual voters have a small probability of changing the outcome, and therefore may rationally remain uninformed, diminishing the chance that voting will produce an informed collective decision that is supported by the voting population. Second, voting produces inefficient decisions in many cases where the set of controlling patrons exhibit diverse preferences. Majority voting, for example, favors the choice of the median voter, while Kaldor-Hicks efficiency considers the valuation of all voters (and nonvoters). These inefficient decisions occur when a small group of controllers desire some action intensely but are outvoted by a larger group that mildly dislikes some action. In these circumstances, an outcome may lose in spite of the fact that it is efficient from a Kaldor-Hicks perspective.

B. Allocating Control

In a typical large organization, the vast majority of control rights are exercised by patrons of the organization termed the board of directors, who in turn appoint the executives of the company. (To keep things simple, I will assume that the Board of Directors and executives are a homogeneous body that I call "management.") Granting control rights to management allows decisions to be made relatively quickly and cheaply. Requiring a vote for all organizational decisions is not feasible.

Management control, however, raises the specter of principal-agent problems. Instead of running the organization to maximize its benefit for all patrons, management may run the organization to maximize the benefit to management. Fiduciary duties may limit managerial opportunism, but cannot eliminate it. As a result, management generally does not have unfettered control over the organization. Instead, some class of patrons generally exercises control on important issues such as the choice of management. Hansmann[24] and Easterbrook and Fischel[25] assume that control should only be exercised by

---

22   *Id.* § 214.
23   Hansmann, *supra* note 17, at 39.
24   *Id.* at 62-64.
25   Easterbrook & Fischel, *supra* note 14, at 405.

one group of patrons. They observe that heterogeneity of preferences, which is likely to be extreme when multiple groups of patrons enjoy voting rights, raises the probability that median preferences will diverge from average preferences, leading to inefficient voting choices.

Which single class of patrons should exercise this element of control over management? Easterbrook and Fischel observe, partially incorrectly, that "voting rights are universally held by shareholders, to the exclusion of bondholders, managers, and other employees."[26] While this observation does not apply to nonprofit organizations, mutually owned corporations, or cooperatives, it accurately describes publicly held for-profit corporations. They explain that "residual claimants . . . are the group with the appropriate incentives to make discretionary decisions" because they receive "most of the marginal gains and incur most of the marginal costs" of decision-making.[27] As a result, allocating control to residual claimants maximizes social welfare, explaining its prevalence.

In addition to the factors examined by Easterbrook and Fischel, Hansmann argues that residual claimants have another characteristic that makes them ideal controlling patrons. He claims that residual claimants share a common goal, namely maximizing residual profits.[28] This reduces heterogeneity, which in turn reduces the costs of collective action. Employees, by contrast, "are far more likely than investors to differ among themselves concerning the firm's policies."[29] As a result, employee control is relatively rare, in spite of the large costs associated with acquiring labor via market contracting.[30]

C. Critiques of Control via Voting as a Transaction Cost Minimizer

The existing framework provides a convincing explanation for many patterns of control. Nevertheless, the framework makes several questionable assumptions, including: 1) voting is the only means of collective decision-making; 2) shareholders are homogeneous; and 3) the costs of heterogeneity between shareholders and other stakeholders are relatively small. If these assumptions

---

26   *Id.*

27   *Id.* This claim is debatable. Employees may also bear a significant amount of marginal costs and benefits of decision-making, to say nothing of customers, local residents, etc. Even the government, through corporate taxation, receives a substantial share of the benefits of profitable new projects.

28   Hansmann, *supra* note 17, at 62-63.

29   *Id.* at 89-90.

30   *See id.* ch. 5.

prove false, the framework's explanatory power and normative force are attenuated.

1. Exclusion of Other Means of Collective Decision-Making

The theories described above assume that voting, in particular majority or plurality voting, is the only means of collective decision-making. In practice, this assumption is justified. Many organizations, such as corporations, democracies, or condominium associations, make collective decisions through voting. Some of the practical appeal of majority or plurality voting, however, may be due to its entrenched status within the law. Majority or plurality voting is the default standard for corporate collective action, and corporate default laws, and even default laws that are *ex ante* inefficient for numerous organizations, are extremely sticky.[31] Thus, the preponderance of voting rather than alternative control mechanisms may not be due to voting's inherent efficiency, but rather to its privileged legal status.

As a theoretical matter, the focus on majority and plurality voting is simply unjustified. There are many other collective choice mechanisms.[32] Each of these mechanisms entails costs and benefits. As detailed above, the costs of majority and plurality voting are considerable. Consequently, the assumption that collective decision-making occurs by voting is not innocuous. Majority voting imposes costs, and organizations and organizational law will evolve to minimize those costs. Thus, assuming that voting is the only means of collective decision-making carries implications for all of organizational law.

2. The Costs of Heterogeneity

In majority voting, heterogeneity leads to inefficiencies. Intensity of preferences cannot be accommodated in majority voting, and thus voting maximizes the welfare of the median voter, rather than maximizing efficiency.[33] While the ability to purchase multiple shares allows claimants to residual profits with intense preferences to acquire multiple votes, risk aversion and capital

---

31   *See, e.g.*, Omri Ben-Shahar & John A.E. Pottow, *On the Stickiness of Default Rules*, 33 Fla. St. U. L. Rev. 651, 651-52 (2006); Henry Hansmann, *Corporation and Contract*, 8 Am. L. & Econ. Rev. 1 (2007); Michael Klausner, *Corporations, Corporate Law, and Networks of Contracts*, 81 Va. L. Rev. 757 (1995); Yair Listokin, *What Do Corporate Default Rules and Menus Do? An Empirical Analysis*, 6 J. Legal Stud. 279 (2009).

32   *See* Dennis Mueller, Public Choice III, at ch. 7, 8 (2003).

33   *See* Levmore, *supra* note 4.

constraints limit this solution to the intensity problem.[34] If voting is the only means of taking collective action, then this inefficiency implies that control should gravitate towards groups with homogeneous preferences. Indeed, homogeneity figures prominently in the explanations of allocation of organizational control just described. Control is typically exercised by a single class of claimants because allowing multiple claimants to exercise control increases heterogeneity among the voters. Claimants to residual profits, and not employees or some other group of patrons, typically exercise control of large organizations because their preferences are relatively homogeneous.

Even when control is awarded to a supposedly homogenous class of stakeholders such as shareholders, heterogeneity cannot be avoided. Indeed, aversion to shareholder heterogeneity explains a considerable amount of corporate law regarding shareholder voting. Minority shareholders need protection because collective decision-making is exercised via vote and the preferences of minority shareholders may be different — and more intense — than the preferences of the majority. Suppose, for example, that a corporation is 51% owned by a majority shareholder and that an asset is worth $100 to the corporation and $80 to the majority shareholder. Efficiency requires that the asset stay with the corporation. In unfettered majority voting, however, the majority shareholder may exercise control of the corporation and attempt to sell the asset to herself for $50. The majority shareholder gains from this transaction. The value of her shares go down by 0.51*$50=$25.50, but the value of her personal assets go up by $30=$80-$50. Thus, she would vote in favor of the transaction because it gives her $4.50. The minority shareholder loses 0.49*50=$24.50. The minority shareholder's preferences are more intense than the majority shareholder's, but there is nothing he can do because the majority vote wins. To prevent this inefficient outcome of majority voting, corporate law has developed the fairness doctrine for corporate transactions.[35] This doctrine restricts voting as a collective decision-making mechanism.

Restrictions on vote buying and empty voting[36] also stem from fears of preference heterogeneity in the class of controlling patrons. Both techniques allow some patrons to amass control without a proportionate claim on residual claims. This enables patrons who seek goals other than residual claim maximization to acquire control, raising the possibility of inefficient

---

34   If there were no such constraints, the claimant with the most intense preferences would acquire all votes, and therefore every decision would be unanimous.

35   *See, e.g.*, Kahn v. Tremont Corp., 694 A.2d 422, 428 (Del. 1997); Sinclair Oil Corp. v. Levien, 280 A.2d 717 (Del. 1971).

36   Paul Edelman & Robert Thompson, *Corporate Voting*, 6 Vand. L. Rev. 129 (2008) (providing an excellent discussion of these subjects).

voting outcomes due to preference heterogeneity. These restrictions are complicated, costly to enforce, and sometimes hotly debated. Nevertheless, they are necessary to prevent majority voting from causing widespread inefficiencies in the presence of preference heterogeneity among shareholders. Collective decision-making mechanisms that produce efficient decisions in spite of preference heterogeneity, however, would reduce the need for these doctrines.

In total, allocation of control rights and legal restrictions on control depend critically on the technology of collective decision-making. Organizational law relies heavily on voting, particularly majority voting, for decisions by controlling patrons. Voting has many advantages, but entails large costs in the presence of heterogeneous preferences. As a result, much of organizational law seeks to mitigate heterogeneity problems amongst the controlling patrons. In the following Parts, I seek to demonstrate how an alternative collective decision-making mechanism — the VCG "pivotal" mechanism — facilitates efficient decision-making in the presence of heterogeneity. I propose that the pivotal mechanism be offered as a menu option to corporations and other organizations via organizational law. The pivotal mechanism would mitigate many of the costs of majority voting, though it would also introduce some novel costs.

II. THE VCG "PIVOTAL" MECHANISM

In the presence of heterogeneity in the population of controlling patrons, why not simply ask people the value they personally attribute, in dollar terms, to a given outcome? If the sum of the values attributed to a given outcome is greater than the cost of attaining that outcome, then pursue that outcome. Otherwise, do not pursue the outcome. This procedure accounts for heterogeneity. Someone who intensely desires the outcome will have a large impact on the outcome in this procedure by reporting a strongly positive value for the desired outcome.

There is a fatal flaw with the "mechanism" of asking and summing preferences, however. When asked for her preferences, an individual has no incentive to tell the truth. If she wants the entity to pursue an outcome, she can tell the entity that she values the outcome at an incredibly high amount rather than her true value, because this will raise the probability that the outcome that she prefers will occur. If no one is telling the truth, then the mechanism may not produce efficient outcomes, since it is not adding up true individual preferences.

Unlike the technique of simply asking people about their preferences with regard to public goods, the pivotal mechanism accounts for heterogeneous valuation, while inducing truth-telling. The mechanism induces truth-telling by requiring individuals to pay for the "externality" caused by their preferences. If an individual's preferences are "pivotal," changing the decision from what it would be without that individual, then that individual must pay some amount to compensate the rest of the polity for altering the decision.

I propose that corporate law, and organizational law more generally, explicitly enable decision-making via the VCG "pivotal" mechanism in which all shareholders of a corporation participate. To illustrate the mechanism, assume, as in Table 1, that a corporation has three shareholders, A, B and E,[37] and is facing the choice between two decisions X and Y.[38] (For example, suppose that X is one slate of directors, and Y is a dissident slate.) Further assume that all individuals have quasi-linear preferences.[39] This means that there is some "numeraire" good, such as money, that can be used to measure the values of other goods in a consistent fashion, enabling the value difference between decisions X and Y to be expressed in terms of the numeraire good.[40] For simplicity, assume that there are no other stakeholders. All shareholders have $100 in preexisting monetary wealth. A, B, and E's relative preferences for decision X versus Y are given in Table 1.[41] A prefers X to Y by $30, B prefers Y to X by $40, and E prefers X to Y by $20.[42]

---

37   More generally, suppose that there are $i \in I$ agents.

38   More generally, suppose that an outcome is a vector $x = (k,t_1,...,t_I)$, where $k \in K$ denotes the choice of a particular outcome and $t_i \in \mathbf{R}$ denotes the "tax payment" of individual i.

39   That is, $u_i(x_i,\theta_i) = v_i(k,\theta_i) + (\overline{m}_i + t_i)$ where θ_i denotes agent i's type and $\overline{m}_i$ denotes agent i's initial endowment of the numeraire quantity. Andreu Mas-Colell et al., Microeconomic Theory 43, 876 (1995).

40   Stakeholders may care about the identity of the directors for any reason. All stakeholder preferences for decision X must be "monetized" — expressed in a term that can be added to the amount of money that they have in determining their overall welfare. These preferences are called "quasi-linear preferences." *Id.* at 876.

41   These valuations may include or exclude a per capita payment from each individual to finance the outcome in question.

42   This follows Mueller, *supra* note 32, at 160 tbl. 8.1. In terms of our general framework, this example corresponds to I=3, $\overline{m}_A = \overline{m}_B = \overline{m}_E = \$100$, $v_A(X_i) - v_A(Y_i) = \$30$, $v_B(X_i) - v_B(Y_i) = -\$40$, $v_E(X_i) - v_E(Y_i) = \$20$.

Table 1: The Pivotal Mechanism: An Illustration

Stakeholder	Decision		VCG Tax	Preexisting Monetary Wealth
	X	Y		
A	$30		$20	$100
B		$40		$100
E	$20		$10	$100
Total	$50	$40	$30	

The pivotal mechanism proceeds by asking for valuations from A, B, and E and then specifying an outcome, X or Y, and payments for A, B, and E, that is a function of the reported valuations.[43] The state, or some other trustworthy operator, asks A, B, and E their relative valuations of X and Y, which are provided as noted below. The state then adds up the net valuations for each decision and chooses the outcome with the highest total value. The total valuation of X sums to $50, which is greater than the total valuation of Y, which sums to $40. Thus, the X slate of directors is declared the victor.[44]

Now the state must determine payments. Shareholder B is not pivotal. His statement that he preferred Y by $40 did not change the outcome. Thus, he pays nothing. Shareholder A, by contrast, is pivotal. Without shareholders A's statement that she preferred X by $30, decision Y would have won rather than decision X. A must therefore pay a VCG "tax" equal to the total net gains expected by B and E from the victory of decision Y in A's absence. The net benefits of Y in A's absence would be $20, which is the difference between $40 [B's valuation of Y] and $20 [E's valuation of Y]. A therefore pays a pivotal mechanism "tax" of $20. Shareholder E is also pivotal: without E's valuation, decision Y would have defeated decision X by $40 to $30. Thus, E must pay a tax of $10. The total VCG taxes of $30 are passed to the government or to some other entity outside the organization.

Now consider A, B, and E's incentives to tell the truth about their valuations, given that the others tell the truth. If A states any (false) relative valuation of less than $20 for X, then Y will be the winning decision. In this case A will not be pivotal, and will therefore save paying the $20 VCG tax. A will also be deprived of decision X, however, which was worth $30 to her. Thus, underreporting her value below $20 causes A to be worse off than reporting her true value of $30. If A states any value greater than $20, then her total

---

43   A social choice function, $f(\ )$ in this context takes announced preferences, $\hat{\theta}$, and produces outcomes, $K(\ ) \in K$ and $t_1(\ ),...,t_I(\ )$.

44   More generally, a social choice mechanism is efficient when $\sum_{i=1}^{I} v_i(k(\theta), \theta_i) \geq \sum_{i=1}^{I} v_i(k, \theta_i)$.

surplus does not change. So bidding her true value of $30 is at least as good as any other strategy, but better than some.

A is indifferent between bidding any number greater than $20 in this example, but now suppose that A does not know the sum of B and E's valuation for X. For example, E's valuation could have been $11 instead of $20. In this case, any number less than $30 would leave A in a worse position than stating $30, because any number less than $30 means that decision Y wins. Alternatively, E's valuation could be $9. In this case, any (false) overstatement of value by A hurts A. If A said $35 when E's value was $9, A would pay a tax of $31, which exceeds A's benefit from decision X of $30. Thus, stating $30 for decision X is better for A than any other statement, and A tells the truth. An identical calculus occurs for stakeholders B and E.[45]

We have therefore demonstrated that the VCG mechanism creates incentives for each stakeholder to tell the truth in this example.[46] In turn, the truth-telling incentive ensures that the VCG mechanism delivers the Kaldor-Hicks efficient outcome. The mechanism chooses the outcome that maximizes the sum of aggregated utilities — which is exactly the Kaldor-Hicks criterion — and these utilities are stated truthfully.

III. Advantages of the Pivotal Mechanism

The pivotal mechanism just described offers many advantages for organizations. In organizations that take decisions by voting but face considerable heterogeneity — such as condominium associations — replacing member voting by the pivotal mechanism ensures that the organization takes decisions that maximize social welfare. In organizations where control is allocated to a homogeneous group to avoid the costs of heterogeneity, the pivotal mechanism offers a

---

45 Note that multiple equilibria are possible. The equilibria of everyone stating X is worth $1000, for example, is a Nash equilibrium. No one gains from deviating in these equilibria. Nevertheless, some argue that the truth-telling equilibrium is focal in a way that these other equilibria are not. *See* Mas-Collel et al., *supra* note 39, at ch. 23 app. AA.

46 Formally, it can be shown that an outcome determination, $k'(\theta)$, satisfying the condition in footnote 44 is "truthfully implementable in dominant strategies" if, for all i, $t_i(\theta) = \left[\sum_{j \neq i} v_j\left(k'(\theta), \theta_j\right) \right] + h_i\left(\theta_{-i}\right)$, where $h_i(\ ) = -\max\left[\left[\sum_{j \neq i} v_j\left(k'(\theta), \theta_j\right) \right], 0 \right]$. There are an enormous variety of published proofs of the theorem. *See, e.g.,* Bernard Salanie, The Microeconomics of Market Failures 78-85 (2000); Mas-Collel et al., *supra* note 39, at 877-78.

means of expanding the population exercising control, with the potential for increases in efficiency.

A. Exercising Control of Condominiums: The Pivotal Mechanism Improving the Decisions of Nonprofit Organizations

Occupant ownership of multifamily dwellings provides many advantages over renting from a landlord. Rental tenants may not optimally maintain properties, as the long-term benefits of maintenance accrue to the landlord. Landlords may holdup tenants when the lease is over, knowing that moving is costly for the tenant. Occupant ownership mitigates these problems, and has proliferated through the condominium and cooperative ownership forms.

Occupant control of multifamily dwellings raises other costs. Multi-unit dwellings inevitably include some common spaces, such as elevators, lobbies, or amenities, which must be jointly controlled. While a single owner of a multi-unit dwelling will invest in these goods to maximize expected profit, a condominium must collectively make these decisions. Inevitably, the preferences of condominium owners are not identical. Some owners may desperately want lavish amenities, while others prefer to economize. While preferences for such public goods vary, their costs are generally shared without reference to the preferences. Indeed, condominium law generally resolves these questions by majority vote.[47] When preferences are intense, this leads to inefficient outcomes as well as tension.

To illustrate, suppose that condominium owner A prefers option X (cheap amenities, low per capita cost) $30 more than option Y (fancy amenities, high per capita cost), B values option Y at $60 relative to option X, and E values option X at $20 more than option Y (see Table 2). In this case, the Kaldor-Hicks efficient outcome is option Y, which has total benefits of $60, rather than option X, which has total benefits of $50. In this example, the three condo owners have extremely heterogeneous preferences. B intensely values option Y, while A and E value option X to a smaller degree.

In the presence of such heterogeneity, voting does not produce the Kaldor-Hicks efficient outcome. If A, B, and E vote on option X versus option Y, then X will receive the votes of A and E. Majority voting yields option X rather than the more efficient Y.

---

47   *See* Carol Rose, *Canons of Property Law*, 108 Yale L.J. 601, 621 (1998).

Table 2: The Pivotal Mechanism with Y as the Socially Efficient Outcome

Stakeholder	Decision		VCG Tax	Preexisting Monetary Wealth
	X	**Y**		
A	$30			$100
B		$60	$50	$100
E	$20			$100
Total	$50	$60	$50	

The pivotal mechanism, by contrast, produces the efficient outcome, Y, by summing up the values of A, B, and E with respect to X and Y and choosing the option with the higher sum. Y has a sum of $60 while X has a sum of $50. Shareholder B must pay $50, while owners A and E pay nothing. As demonstrated above, the pivotal mechanism produces incentives for all owners to tell the truth about their valuations, ensuring that the mechanism sums honest reports of preferences and producing the efficient outcome.

The pivotal mechanism's superiority to majority voting in this reasonable scenario of intense preference heterogeneity supports the following recommendation. Instead of providing that the condominium board of directors provide one budget for ratification by condo owners,[48] the law should offer a second budget approval process as an option. In the new process, the board of directors formulates two budgets: a "cheap budget," with low amenities and cost, and an expensive budget, with high amenities and cost. The condo owners would then choose either option via the pivotal mechanism. Pivotal voters' payments would go either to the government or to a pool of condominium voters (see below for details). While the pivotal mechanism cannot prevent hard feelings, it can ensure efficient outcomes and assuage losers with the knowledge that some of the winners paid for their victory in cash.

B. Shareholder Voting

Although shareholders in for-profit corporations are generally presumed to be homogeneous, this is not necessarily the case. Indeed, if shareholders truly are homogeneous along all dimensions (including preferences and information), then decision-making by majority voting is unnecessary. Any voting rule, including one requiring unanimous approval, produces the outcome desired

---

48   For a description of Connecticut's requirements for budget approval, see GEORGE COPPOLO, CONDOMINIUMS — ANNUAL BUDGET — UNIT OWNERSHIP ACT (2008), *available at* http://www.cga.ct.gov/2008/rpt/2008-R-0354.htm.

by all homogeneous shareholders. The existence of non-unanimous votes and majority decision rules demonstrates that shareholders are not always perfectly homogeneous. Non-homogeneity may have two causes. Shareholders may share a preference to maximize residual profits, but have different opinions about the best way to achieve such maximization. Alternatively, shareholders may have different preferences, with some desiring to maximize profits while others have more complicated ends, such as maximizing profits without harming the environment,[49] or maximizing the value of some other relationship with the corporation. Given the existence of shareholder heterogeneity, the pivotal mechanism may improve efficiency under the following conditions.

1. Intense Minority Information Relative to the Majority

Suppose that all shareholders vote to maximize profits but differ regarding the best way to do so. Each shareholder receives an unbiased and independent estimate of the relative value of options X and Y and votes for the option with the higher value. To illustrate, consider Table 2. In Table 2, efficiency is maximized and the Kaldor-Hicks efficient outcome is option Y, which has total benefits of $60, rather than option X, which has total benefits of $50. In this example, the three shareholders have extremely heterogeneous preferences. B intensely values option Y, while A and E value option X to a smaller degree.[50] In the presence of such heterogeneity, voting does not produce the Kaldor-Hicks efficient outcome. If A, B, and E vote on option X versus option Y, then X will receive the votes of A and E. Majority voting yields option X rather than the more efficient Y.

The pivotal mechanism, by contrast, produces the efficient outcome, Y, by summing up the values of A, B, and E with respect to X and Y and choosing the option with the higher sum. Y has a sum of $60 while X has a sum of $50. Shareholder B must pay $50, while shareholders A and E pay nothing. As demonstrated above, the pivotal mechanism produces incentives for all shareholders to tell the truth about their valuations, ensuring that the mechanism sums honest reports of preferences. Note that the difference

---

49   "Socially responsible" investment funds currently manage over two trillion dollars in assets. *See* Forum for Sustainable & Responsible Inv., REPORT ON US Sustainable, Responsible and Impact Investing Trends 2014 (2014), *available at* http://www.ussif.org/Files/Publications/SIF_Trends_14.F.ES.pdf.

50   One might argue that the ability to purchase shares means that the example provided above would never occur. B's intense preference would lead B to purchase shares from A and E. Capital constraints and risk aversion, however, may prevent B from purchasing all shares. Indeed, without some constraints on the ability of the highest-valuing user to purchase additional shares, there would be no non-unanimous corporate votes.

between shareholder decision-making and condominium decision-making is not in kind. In both contexts, there are heterogeneous preferences (different opinions about profit maximization, or different preferences about amenities) that imply that simply majority voting is inefficient. The relevance of the pivotal mechanism to such a wide class of situations demonstrates the wide range of the mechanism's potential applicability.

2. Minority Oppression

Now suppose that shareholders share information but have different preferences. Some shareholders seek to maximize profits, while others seek to maximize the sum of their share of profits and their private benefits. Specifically, suppose that E is the manager of the company as well as the controlling shareholder and owns two shares of the company, as shown in Table 3. Shareholder B just wants to maximize profits, and outcome Y provides $60 more in profit per share than X. X, however, provides private benefits to E as manager. These private benefits are sufficient to overcome the lost value of residual claims for E, but not sufficient to overcome the total lost profit from choosing X. In a majority vote between X and Y, however, E will cast two votes for option X, leading to option X's victory. The majority shareholder is able to impose his will to force the corporation into inefficient outcome X.

Table 3: The Pivotal Mechanism: Overcoming Minority Oppression

Stakeholder	Decision		VCG Tax	Preexisting Monetary Wealth
	X	Y		
E	$20			$100
B		$60	$40	$100
E	$20			$100
Total	$40	$60	$40	

As mentioned above,[51] corporate law is acutely aware of this problem, termed "minority oppression." Indeed, Delaware corporate law imposes several restrictions on majority voting to prevent the inefficiency presented here. Instead of ordinary majority voting, corporate law makes transactions with controlling shareholders or directors voidable unless approved in good faith by the majority of disinterested stockholders (termed "a majority of the minority").[52]

---

51   *See supra* note 7 and accompanying text.
52   *See* Del. Code Ann. tit. 8 § 144(a)(2); *In re* Wheelabrator Techs. Inc. S'holders Litig., 663 A.2d 1194 (Del. Ch. 1995).

While requiring "a majority of the minority" to approve interested party transactions reduces the costs of majority voting with a controlling shareholder, it imposes some new costs. First, it excludes a shareholder who may well have purchased shares at a premium in order to exercise control from exercising that control. Second, it deprives shareholder voting of the signal of potentially the most informed shareholder. While a controlling shareholder is conflicted, they also possess good information about whether an asset is worth more in the hands of the company or in the hands of a private party. Majority of the minority doctrines lose this information, with the potential for a resulting loss of efficiency. To illustrate, suppose that the controlling shareholder E in Table 3 values option X at $40 per share rather than $20. This means that option X is more efficient than Y. Majority of the minority voting, however, includes only shareholder B, who will choose option Y in spite of option X's efficiency.

In total, ordinary majority voting produces inefficient outcomes when a controlling shareholder exercises control to exploit the corporation. Majority of minority voting produces inefficient outcomes when there are differences in information and the controlling shareholder's information is discarded.

If we use the pivotal mechanism, by contrast, we get the efficient outcome in all cases. In Table 3, there are two participants in the mechanism, B and E. E values decision X at a total of $40,[53] while B values Y at $60. Both will truthfully tell their preferences. The mechanism produces outcome Y — the efficient outcome — with shareholder B making a payment of $40. Thus, the pivotal mechanism offers a cure for minority oppression that is not available under majority voting.[54]

Alternatively, if shareholder E values decision X at a total of $80, then E will report this preference; the total value of X ($80) will exceed Y ($60) and X will prevail, with E making a payment of $60. The pivotal mechanism thus produces the efficient outcome in this case also, while the majority of the minority voting mechanism would produce outcome Y.

3. Asset Substitution and the Pivotal Mechanism

Because the pivotal mechanism can accommodate heterogeneity at relatively low cost, it allows expansion of control to corporate stakeholders that are currently without control. One important conflict between shareholders and other stakeholders is the asset substitution problem. Consider a firm with two

---

53   Alternatively, E could participate twice with each share and state that his valuation is $20 per share. Some problems with this alternative are discussed below.

54   Although the pivotal mechanism produces the efficient outcome (Y), shareholder B is forced to make a payment to avoid being exploited in this example. The costs of this requirement are discussed in Part IV below.

shareholders, A and B, and one creditor Z. Creditor Z is owed $40. The firm is choosing between two options X and Y. X is a risky alternative. With a probability of 0.4 it will yield $100 and with a probability of 0.6 it will yield $0, for an expected value of $40. Option Y will yield a safe $50 at all times.

Table 4 presents the relative values assigned to options X and Y by shareholders A and B and creditor Z. A and B only realize residual profits after Z has been paid and split these profits evenly. If option X is chosen, a 50% share to residual claims is worth $12=0.5(0.4*($100-$40)+0.6*$0). If option Y is chosen, a 50% share to residual claims is worth $5=0.5($50-$40). Option X is therefore worth $7 more per share than option Y. Creditor Z's claim is worth $16=0.4*$40 if option X is chosen and $40=1.0*$40 with option Y. Z therefore values option Y by $24 more than X.

Table 4: The Pivotal Mechanism and Asset Substitution

Stakeholder	Decision		VCG Tax	Preexisting Monetary Wealth
	X	**Y**		
A	$7			$100
B	$7			$100
Z		$24	$14	$100
Total	$14	$24		

Under these circumstances, A and B are not the only "residual claimants" of the firm. Instead, Z is also a residual claimant because Z is not paid in full in some circumstances. If control is exercised by voting by A and B, then they will choose option X because it produces higher payoffs to them than Y. X is not efficient; however, it is chosen because shareholders A and B do not take into account creditor Z's loss from choosing X.

Creditors and owners are aware of the asset substitution problem and take steps to avoid it. For example, contractual covenants and security interests may limit the ability of claimants to residual profits to take inefficient decisions that hurt creditors more than they help shareholders. Shareholders may agree to these restrictions because they lower the interest rate demanded by creditors, who must be compensated for bearing the risk of asset substitution. Nevertheless, contracts are invariably incomplete and the asset substitution problem remains a real one, as evidenced by the existence of fiduciary duties to creditors in the zone of insolvency.[55]

---

55 *See* Credit Lyonnais Bank Nederland, N.V. v. Pathe Commc'ns Corp., No. CIV. A.12150, 1991 WL 277613, at *1155-56 (Del. Ch. Dec. 30, 1991) ("[I] n managing the business affairs of a solvent corporation in the vicinity of

Granting voting rights to creditors appears to be a simple solution to the asset substitution problem, but this solution entails its own inefficiencies. If creditors are granted considerable voting rights that enable them to prevent the asset substitution problem, they may exercise these rights to have the firm inefficiently avoid risks. The positive expected value of some risks benefits equity, and not creditors, in a mirror image of the asset substitution problem. The pivotal mechanism, on the other hand, offers a means for aggregating shareholder and creditor preferences to produce efficient outcomes. If a decision harms creditors more than it benefits shareholders, as in Table 4, then creditors will use the pivotal mechanism to prevent the inefficient imposition of risk. If the benefits to shareholders exceed the costs to creditors, by contrast, then the pivotal mechanism will produce shareholder victories.

I therefore propose that organizational law develop the pivotal mechanism with shareholder and creditor participation as a means of mitigating the asset substitution problem, without preventing efficient risk-taking. This mechanism could be introduced when a firm's solvency is at risk. For example, bankruptcy decision-making is plagued by the difficulty of aggregating preferences of investors with many different priority levels. Many commentators believe that decisions in bankruptcy are therefore unlikely to be efficient.[56] Allowing bankruptcy decisions to be decided by the pivotal mechanism allows these heterogeneous preferences to be aggregated in a manner that promotes efficiency.

4. Stakeholder Control of for-Profit Organizations and the Pivotal Mechanism

The asset substitution problem is far from the only type of opportunism that arises in shareholder-controlled firms. Shareholders may choose employment levels and conditions to maximize returns, ignoring the value of employment to employees. If this value is positive, then shareholder/controllers may systematically choose inefficient levels of employment.[57]

Complete or partial employee control enables a firm to account for employee preferences when taking decisions, while retaining flexibility. Indeed, these control benefits must be considerable because employees of organizations own

---

insolvency, circumstances may arise when the right (both the efficient and the fair) course to follow for the corporation may diverge from the choice that the stockholders . . . would make if given the opportunity to act.").

56   For creative mechanisms that improve bankruptcy outcomes, see Philippe Aghion, Oliver Hart & John Moore, *Improving Bankruptcy Procedure*, 72 Wash. U. L.Q. 849, 858-61 (1994); and Lucian Arye Bebchuk, *A New Approach to Corporate Reorganizations*, 101 Harv. L. Rev. 775, 778 (1988).

57   *See* Shleifer & Summers, *supra* note 13.

more than one trillion dollars of equity in their employers,[58] in spite of the fact that a claim on a firm's residual profits is an extremely undesirable asset for an employee from a diversification perspective.[59] Under German law, for example, employees are granted some control rights through membership on a supervisory board that exerts some control over a firm.[60] Too much employee control, however, raises costs of its own. Employees, ignoring the interests of claimants to residual profits, may prefer to protect jobs rather than explore positive expected value opportunities that may lead to job losses. Moreover, employee preferences are often heterogeneous themselves. If a firm has two factories and employees are in control, then employees in factory B may vote to shut factory A and vice versa,[61] producing inefficiencies resulting from heterogeneity.

The pivotal mechanism, by contrast, offers a means of aggregating residual claimant and employee preferences in a manner that promotes efficient decision-making. Consider Table 2, reproduced below, and assume that A and E are shareholders, while B is an employee. Option X represents closing a factory, while option Y represents keeping it open. When shareholders take decisions by majority vote, they will choose option X. Option X is inefficient, however, because it imposes costs on employees that are greater than its benefit to shareholders. The pivotal mechanism, by contrast, yields the efficient outcome Y, with employee B making a large payment into the pool as the pivotal participant. The pivotal mechanism also produces the Kaldor-Hicks efficient outcome when job loss is efficient. If the benefits of Option Y to employee B are $40, as they are in Table 1, then the pivotal mechanism specifies option X, with shareholders paying into the pool.

---

58   *See A Statistical Profile of Employee Ownership*, The Nat'l Ctr. for Emp. Ownership (updated June 2014), http://www.nceo.org/library/eo_stat.html.

59   Professor John Langbein views this diversification problem as sufficient reason to prohibit employee pension plans from acquiring stock in an employer. *See Reforming ERISA Investment Law: Testimony Before the House Comm. on Educ. & the Workforce*, 106th Cong. (2000) (statement of Prof. John Langbein, Yale Law Sch.), *available at* http://archives.republicans.edlabor.house.gov/archive/hearings/106th/eer/erisa21500/langbein.htm.

60   For a description of the two-tiered board as of 1996, see Thomas J. Andre, Jr., *Some Reflections on German Corporate Governance: A Glimpse at German Supervisory Boards*, 70 Tul. L. Rev. 1819, 1826 (1996) (describing the German two-tiered system).

61   Hansmann, *supra* note17, at 89-98.

Table 2: The Pivotal Mechanism with Y as the Socially Efficient Outcome

Stakeholder	Decision		VCG Tax	Preexisting Monetary Wealth
	X	Y		
A	$30			$100
B		$60	$50	$100
E	$20			$100
Total	$50	$60	$50	

With these efficiencies available, shareholders could choose to allow any identified stakeholder of the firm, including shareholders, creditors, management, other employees, customers, neighbors, etc., to take part in the pivotal mechanism. The mechanism will ensure that a firm's decisions maximize total social welfare rather than shareholder welfare alone. Instead of restricting control in direct proportion to claims to residual profits, the pivotal mechanism allocates control to anyone who participates in the mechanism.

Extending pivotal mechanism control rights to creditors, employees, or other stakeholders introduces complications to corporate governance. The mechanism can only be used sparingly, and so fiduciary duties would need to fill in the gaps. To limit the change to corporate law, I suggest that fiduciary duties of management to shareholders remain unchanged, with the pivotal mechanism introducing an occasional, formal mechanism for recognizing rights of stakeholders that are not ordinarily protected by managerial fiduciary duties.

IV. Costs of the Pivotal Mechanism

A. Direct Costs of the Pivotal Mechanism

As developed above, the pivotal mechanism appears to offer many advantages for the law of corporations and other associations, producing efficient decisions in many cases where other control mechanisms, such as majority voting by residual claimants or management control, produce poor outcomes. The pivotal mechanism is no free lunch, however. It introduces a different set of costs that must be weighed against its benefits. Some of these costs are common to all collective action mechanisms, while others are unique to the pivotal mechanism. These costs will be examined below.

Any decision-making that requires the participation of many parties is an expensive proposition. Individuals not actively involved in an organization's function must take the time to learn about the decision being confronted, a

costly process. This explains why most organizational decisions are not taken by a collective decision-making mechanism, but rather by individual agents. The pivotal mechanism is no exception. Indeed, because the pivotal mechanism involves the participation of all patrons of an organization rather than just shareholders, the direct decision-making costs of the mechanism may be even higher than taking a vote. This implies that the pivotal mechanism cannot be used frequently. Instead, it should only be used for important decisions, in which the efficiencies gained are more likely to outweigh the costs.[62]

The pivotal mechanism also has some unique direct costs; it requires some subset of participants to pay money in some instances. The money raised by the pivotal mechanism cannot be distributed in a way that disturbs the pivotal mechanism's truth-telling properties. If an individual received a redistribution that is a function of her own report of value, then the truth-inducing incentives of the pivotal mechanism would be distorted. The individual would have an incentive to report false preferences, knowing that these reports would affect her payment. As a result, redistribution of the payments cannot depend upon on an individual's valuation report.[63]

If the money raised by the pivotal mechanism is simply wasted, then the truth-telling properties of the mechanism are undisturbed, but the mechanism is no longer as attractive because it involves large amounts of waste.[64] Other methods of redistribution, however, allow the payments to go unwasted without distorting incentives. They may involve the payment of money to individuals outside the organization, however.[65] For example, all pivotal mechanism payments could go to the government. While this would avoid waste, it would be unattractive for any organization to unilaterally adopt the mechanism under these circumstances.

An alternative solution is to have similar organizations trade claims to pivotal mechanism payments.[66] If there are two organizations, H and I, then company I will receive all pivotal mechanism payments made with respect

---

62   To this point, I have assumed that the mechanism guarantees one outcome or another. But if the mechanism can be imposed repeatedly to retake a decision, then this assumption is unwarranted. This changes the expected payoff associated with participation in the mechanism. As a result, there must be some restriction on reuse of the mechanism for the same question.

63   Mueller, *supra* note 32, at 166-67.

64   *Id.* at 161, 166.

65   If an organization unilaterally adopts the pivotal mechanism and transfers the resulting payments outside the organization, then the mechanism would be wasteful from the perspective of the organization adopting the mechanism, even though such a transfer is not wasteful from a social perspective.

66   Mueller, *supra* note 32, at 166.

to organization H, and organization H will receive all pivotal payments made with respect to organization I. If organizations H and I have similar expected pivotal mechanism payments, then from an *ex-ante* perspective the pivotal mechanism is revenue-neutral for each organization. If even this proves unworkable, then there are other more complicated mechanisms for redistributing revenue within the organization that do not distort truth-telling incentives.[67]

In total, while there is no question that the pivotal mechanism is costly, it does not appear that these costs make the mechanism impractical for important decisions.

B. The Problem of Coalitions

A more conspicuous obstacle to the pivotal mechanism is the possibility of coalition formation. Coalition formation may distort truth-telling incentives in the pivotal mechanisms, and prevent the mechanism from producing an efficient outcome.[68]

To illustrate, return to Table 2, which is reproduced below. In this example, outcome Y is efficient. Suppose, however, that A and E know B's valuation and form a coalition, agreeing to each bid $100. In that case, option X would win with a value of $200. In addition, neither A nor E would have to make payments because neither is pivotal. Without E, X would be assigned a value of $100, which is greater than Y's value of $60. Thus, E's bid is not pivotal: X would be chosen even without E's bid. Similarly, without A, X would be assigned a value of $100, meaning that A is not pivotal. Moreover, B has no incentive to change their bid: even if B knows about the coalition between A and E, B can only alter the outcome to Y by bidding over $200, which would require B to make a payment ($200) that is greater than B's preference for Y. By forming a coalition and telling false outcomes, A and E get their desired result — option X — without having to make payments. Option X, however, is inefficient. As a result, if A and E can form a coalition like the one described, the efficiency-generating characteristics of the pivotal mechanism are distorted.

---

67 *See, e.g.*, Martin Bailey, *The Demand Revealing Process: To Distribute the Surplus*, 91 Pub. Choice 107 (1997).

68 Mueller, *supra* note 32, at 167-68; Elaine Bennet & David Conn, *The Group Incentive Properties of Mechanisms for the Provision of Public Goods*, 29 Pub. Choice 95 (1977). Note that other allocation mechanisms, such as the market, fail to produce efficient outcomes when there is collusion.

Table 2: The Pivotal Mechanism with Y as the Socially Efficient Outcome

Stake-holder	Decision			VCG Tax	VCG Tax When Coalitions are Formed	Preexisting Monetary Wealth
	X	X-Coalition	Y			
A	$30	$100			$0	$100
B			$60	$50	$0	$100
E	$20	$100			$0	$100
Total	$50	$200	$60	$50	$0	

Gordon Tullock notes that the problem of coalition formation may not be particularly important.[69] If A and E are not certain about B's valuation, then their incentives to report a false valuation are weakened. If B's valuation of Y is $150, for example, then A and E will have to pay $50 each. Thus, uncertainty weakens A and E's incentive to form a coalition. In addition, both A and E will have incentives to defect from the coalition. If A knows that E will report $100 and does not know B's valuation, then A's optimal report is $30. By reporting $30, A ensures that he pays nothing if B's valuation is under $100 or greater than $130 (assuming that E reports $100). If B reports a number between $100 and $130, then A will make a payment, but will receive the desired outcome. Thus, a coalition where both A and E report $100 is inherently unstable. Finally, coalition formation can be prohibited, much as cartelization is banned under antitrust laws.

If A and E are controlled by the same source, however, then the "defection" obstacle to coalition formation is of little significance. This problem is particularly acute when there is no natural definition of a participant in an organization. For example, if a residual claimant can participate separately for each share that they own, then the claimant can create a coalition with himself, acting as both A and E and precluding the risk of coalition defection.

While this complication cannot be eliminated, there are several responses. First, note that false valuations create risk even when there is no risk of defection. If the false bids prove pivotal, then they each must make a payment. Stating falsely strong preferences therefore creates a risk of high payments in the event that each report is pivotal. Someone controlling two opportunities to participate must weigh the benefits of victory against this risk. Second,

---

69   Gordon Tullock, *Demand Revealing Process, Coalitions and Public Goods*, 29 Pub. Choice 103 (1977).

income restrictions, discussed in the next Section, may reduce the ability of participants to sway outcomes. If participants must show the ability to actually make a payment in order to participate in the mechanism, then their ability to make falsely high reports will be constrained by their assets. Third, the law could develop rules against multiple participations in the pivotal mechanism by the same party.

These rules should be strict: if interests are significantly overlapping then they should be required to make a single report. If someone owns multiple claims to residual profits, for example, then they will be allowed to make only one report to the mechanism. This report may be large: the effect of a decision on multiple claims to residual profits will be greater than the effect on a single claim. Such aggregation will force patrons to make bids that have a higher probability of being pivotal, reviving the truth-telling incentives of the pivotal mechanism.

The cost of multiple participation and collusion is significant enough, however, to suggest that the pivotal mechanism works best when individual participants are relatively easily identified. This could be the case in condominium organizations or in closely held corporations.

C. Income and Wealth Limitations

In the pivotal mechanism, intensity of preferences is measured by someone's ability to trade dollars for a given outcome. While this is a good measure of intensity of preferences and social welfare under the assumption of quasi-linear utility, it has obvious limitations.

Preference reports must be feasible. An individual may feel strongly about an issue, but they cannot report a preference that is greater than their lifetime supply of the numeraire quantity, i.e., money. Any pivotal mechanism will therefore have to verify that an individual can actually pay their reported valuation if they are pivotal before allowing an individual to participate in the mechanism.

But this implies that wealthier individuals, with fewer budget constraints, will have greater ability to express intense preferences, even if poorer individuals feel just as strongly about a certain outcome. Indeed, this is a good argument against using the pivotal mechanism as a substitute for citizen democracy. Democracies may have a strong presumption that all individuals "count" equally, even if they have different resources. This presumption is less powerful when it comes to private organizations. Many of these are already presumed to maximize economic interests rather than democratic interests. At present, for-profit organizations are controlled to maximize the economic interest of shareholders. Enabling other stakeholders to take part in control, even if their

ability to participate is related to their wealth, expands rather than constricts their ability to influence outcomes. In total, the problem of income inequalities should not preclude the use of the pivotal mechanism in organizational law.

D. Can It Work? Evidence from Auctions

In the face of these important objections, can the pivotal mechanism function as a practical method of allocating control of organizations? While there is no definitive answer, several related examples provide some evidence that the pivotal mechanism can produce efficient outcomes.

In a series of lab experiments, Vernon Smith and others examined whether the pivotal mechanism produced efficient outcomes.[70] In eight-player games involving the provision of public goods with the potential for free-riding, the pivotal mechanism consistently produced outcomes that were near the social optimum, suggesting that the theoretical liabilities of the pivotal mechanism do not prevent it from producing "good" outcomes in laboratory settings.[71]

Even better evidence of the pivotal mechanism's practicality comes from real-life auction mechanisms. To maximize revenue and allocate scarce resources to firms valuing them the most, economists recommend auction procedures, sometimes called "Vickrey Auctions," that are analytically very similar to the pivotal mechanism.[72] The goal is to induce individuals to reveal their true valuation of a good and allocate efficiently by having the allocation of the good depend upon everyone's report (the good goes to the highest reporter), without the price paid by any individual depending upon their own report (the winning bidder pays the second highest bid, rather than the highest). This second-price auction mechanism has truth-telling properties very similar to the pivotal mechanism. The mechanism is similarly vulnerable to collusion and should be similarly costly.[73] In spite of these problems, it has been recommended by an expert panel, for use in auctioning CO_2 emissions permits through the United States' first large-scale greenhouse gas trading market.[74] The panel reviewed a large body of empirical research examining mechanisms, and concluded that the pivotal mechanism analogue was practical.[75]

---

70   *See, e.g.*, Vernon L. Smith, *Experiments with a Decentralized Mechanism for Public Good Decisions*, 70 Am. Econ. Rev. 584 (1980).

71   *Id.*

72   *See* Charles Holt et al., Auction Design for Selling CO_2 Emission Allowances Under the Regional Greenhouse Gas Initiative (2007), *available at* http://www.rggi.org/docs/rggi_auction_final.pdf.

73   *See id.* at 45-53.

74   *Id.* at 77-78.

75   *Id.*

Thus, the efficacy of a similar mechanism in auctions provides some evidence regarding the practical applicability of the pivotal mechanism.

Conclusion

In total, it is not clear whether the benefits of the pivotal mechanism in terms of efficient decision-making will outweigh the costs for any organization. It is therefore important to emphasize that the mechanism should be enacted as a menu option, and not as a requirement. The most important benefit of the pivotal mechanism is that it provides a very different set of costs and benefits from traditional methods of organizational decision-making. As a result, enacting the pivotal mechanism as a menu option for collective choice will significantly expand the set of choices of organizational form and decision-making. The creation of such public goods is the primary purpose of organizational law.[76]

The pivotal mechanism may also be held back simply because it has not been widely tested. Voting's weaknesses are well known after centuries of use, and practices and doctrines have developed to mitigate them. The pivotal mechanism's strengths and weaknesses, however, have not been tested. By providing a framework for testing, offering the pivotal mechanism as a menu option for organizational law may facilitate the identification of strengths and weaknesses (and responses to the weaknesses) that would enable it to become a realistic alternative to voting for organizational decision-making.

The pivotal mechanism offers clear advantages over simply majority voting whenever preferences are heterogeneous. The law should therefore further explore opportunities to turn the mechanism's theoretical advantages into practical benefits for the control of organizations.

---

76   *See* Frank Easterbrook & Daniel Fischel, *The Corporate Contract*, 89 Colum. L. Rev. 1416 (1989).