

## A Synthesis

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Papers in this volume address three basic issues. First, are there identifiable economic consequences of accounting reports? Hakansson's paper in the main, and the Leftwich-Watts-Zimmerman and Smith papers in part address that question. The second question—does accounting reporting make a difference in terms of social welfare—is also addressed by Hakansson. Finally, the Newman and Johnson papers primarily address the third question: what is the role of the state in shaping this welfare impact of the accounting standards? Hakansson's paper also addresses this issue.

Much accounting research during the past 15 to 20 years has been concerned with the question: Does accounting matter? Certain interpretations of the finance literature provide the following answer: accounting matters, but only a very little, so far as security markets are concerned. It is not much comfort to know that similar unanswered questions plague the finance literature too. Do dividends matter? Does the capital structure matter? In any case, it seems that a considerable part of theory building in accounting is going to consist of attempts to answer this question and its variations: does accounting matter?

Two models of economic consequences of accounting have appeared. First, chronologically, came the model of accounting as an *output* of the firm jointly produced with other products. The second, more recently developed model sees accounting as one of the *inputs* to the firm. In order to conform to the order of presentation of papers at this conference, we shall discuss the input model before returning to the output model.

In the Hakansson and Leftwich-Watts-Zimmerman papers, accounting systems are regarded as a part of the monitoring scheme of the firm. In Hakansson's framework, timeliness of accounting information and the cost of search are the critical factors that determine the economic

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consequences of the accounting reports. Managers receive a part of their compensation in the form of privileged access to information which they use for trading purposes. Hakansson thus provides a conclusion, and no small comfort to accountants, that in equilibrium, the optimal behavior of agents is affected by the choice of accounting system. Not only the profits of the firm but also the efficiency and distribution of wealth are affected.

Leftwich, Watts, and Zimmerman see reporting as a part of a larger package of monitoring and control devices. Other items in the package are the outside members of the board of directors and listing on a stock exchange. They attempt an evaluation of financial reporting as a part of the control and monitoring package.

Both the Hakansson and the Leftwich-Watts-Zimmerman papers reflect a relatively recent (perhaps no older than ten years) and a welcome change in the way accounting researchers think of a business firm. The standard microeconomic model in which firm is a monolithic, profit-maximizing entity has given way to the model of the firm originated by Coase [1937] and Alchian and Demsetz [1972], where the firm is seen as a set of contracts among independent maximizing agents. In this model, the firm is a set of agents, each of whom seeks advantage for himself. Accounting, along with other devices, helps enforce the rights and obligations of the agents brought about by the contracts that tie them together.

The standard microeconomic model of the firm, being a perfect information model, allows no role for accounting. The contract-theoretic model, on the other hand, permits a much clearer role for accounting reports. This is a welcome change in that the models of imperfect information in economics permit application of economic analysis to substantive accounting issues.

Leftwich et al. refer in the appendix to their paper to an interesting issue: if we are going to use equilibrium models in accounting, we must also face a logical consequence of equilibrium models. The single-equation estimation methods will not, in general, provide us with useful answers. It is well known that if we take the price and quantity data from a market where the price is determined by equilibrium between the supply and demand, a single-equation regression of price on quantity cannot identify the demand or the supply function. A simultaneous-equations approach is needed for estimation of parameters in equilibrium models.

The introduction of models of economic equilibrium into accounting literature therefore places a much heavier burden of using more sophisticated econometric techniques than the single-equation approach used almost universally by accounting researchers. Formal modeling of monitoring variables requires careful development of theory.

Thus, much remains to be done before we can claim that we are using supply and demand equilibrium models and before we can claim that the empirical estimates have a reasonable interpretation. In the meantime,

we have to be careful not to place too much faith in the single-equation results. In simultaneous-equation models, qualitative dependent variables are difficult to handle. The dependent variable in the Leftwich et al. study, too, is a qualitative variable.

In the second, output, model of accounting, a firm is seen to be producing many things, one of which is its accounting reports. In that tradition, Smith's paper seeks to examine the consequences of the change in reporting on stock prices. As an output, reporting could be useful in assessing both the production-investment decisions of the firm as well as the interdependence among the firms in the economy (see Foster [forthcoming]). As an output of the production system, financial reporting has some special properties: (1) it has zero marginal cost of adding one more person to the list of those who are informed; (2) excludability is possible, that is, you can exclude certain people from learning about what those reports are, but it is extremely hard and costly to enforce; and finally, (3) even if you could enforce excludability, in a rational expectations environment the value and price of that information will still be driven to zero because those who have not learned directly about the information will learn about it from the prices. In a fully revealing rational expectations environment, even if the excludability condition were satisfied, the price of information would still be zero and nobody would buy that information.

The rational expectations literature has a couple of interesting implications for what we are doing in accounting literature. Morse mentioned that Hakansson did not permit the nonsubscribing investors to learn from the marketplace. The reason, of course, is that in a fully revealing rational expectations environment there would be no incentive for search, and since Hakansson's purpose in formulating the model is to explain the search phenomenon, the fully revealing rational expectations model would not be suitable for that purpose. But this does not mean that in rational expectations Hakansson's conclusions would not hold. An earlier paper by Kanodia [1980] proves that even in a rational expectations environment a change in reporting system will, in general, change both the equilibrium market price and the equilibrium production investment decisions of the firm when the securities of the firms are traded in a competitive market. We need not be overly concerned by the fact that to prove his results Hakansson used a nonrational expectations type of environment and a not fully revealing rational expectations environment. If we want to explain search phenomenon or to assign nonzero value to information in a marketplace, we cannot assume fully revealing rational expectations.

A second interesting implication of rational expectations in the literature concerns the suggestion made earlier today about the possibility of experimentation by the Securities and Exchange Commission or the FASB on accounting. Let us conduct a thought experiment of this type. An accounting rule is issued, stock market reaction is observed, and if the

reaction is undesirable, a change is made in the accounting rule. Consider a scenario of what will happen if the FASB or the SEC adopted and announced such a policy. A change in the accounting rule for, say, the oil firms is made. It hurts these firms and their stock price goes down. But the investors conclude that because the stock price of these firms has gone down, the FASB will have to reverse its earlier decision. Suppose the FASB has already announced that anytime there is more than a 1-percent decrease in stock price, the rule will be changed. The consequence will be that investors will anticipate the reversal, and therefore the decline in stock price will not take place. If a decline in stock price does not take place, of course, the FASB will not reverse the rule!

Thus, the relationship between the anticipatory effect of a competitive marketplace and its relationship to this kind of fine-tuning policy is very complex. It does not permit us to make simple policy rules or conduct economy-wide experiments. These feedback effects in a competitive market have also been recognized more recently in what is being done in macroeconomics policy in recent years. Many economists are no longer keen on trying to fine tune the economy, and many are now arguing for a stable policy that allows all concerned to know what the economic system is going to be like in the future. A steady policy allows economic agents to have a chance to adjust their behavior to a stable system. Perhaps we could consider adopting something like that for the accounting environment: hold the accounting environment steady so people can adjust their own behavior to that accounting environment and do not try to fine tune the reporting system to every little change in the environment. Changes in financial standards themselves cause further disturbances and ripples which often become grounds for more changes.

The papers in this conference do not give a definite answer to the question: does accounting matter? Our reading of the papers is: Hakanson says "yes," Smith says "seems so," and Leftwich, Watts, and Zimmerman say "well, we can't tell from this data, at least not yet."

The second question was: if accounting methods do have observable economic consequences, what are their welfare economics interpretations? Presumably, the purpose of this conference has something to do with society at large and with social institutions. Can we make an argument that there should be some social involvement in accounting standards? The third issue is: if there is going to be some social intervention, then what should be its forms?

We approach the second question of welfare consequences of accounting with standard welfare economic tools. These seem to be the only tools which may help analyze the various market failures that would justify social intervention in accounting reports. The nature of market failure depends on how one views the role of accounting in the total production of the firm. If accounting is seen as an input, then the firms themselves should be able to design the terms which govern the principal agent relationships. Competition among firms will induce them to take advan-

tage of their unique circumstances and to develop efficient, perhaps unique practices for their organization. There seems to be no important role for accounting standards if accounting is seen as an input. If accounting is seen as an output by investors to decide where to put their funds, then it has the attributes of a public good. Here, the possibility of a market failure of a classic public good/externalities type arises.

Seen as an output, the accounting report is a commodity that can be produced at zero marginal cost; and we must face the usual problems in enforcing property rights. Furthermore, rational expectations models suggest that if one buys the information and uses it, his actions immediately reveal what he knows; therefore other people can take advantage of what he knows. The prisoner's dilemma then says that in such cases no one will pay for the information. Everyone will sit back and wait for someone else to buy it. Management will have trouble selling the information, and therefore no one has a unilateral incentive to produce the information. The whole thing collapses with no information, even though everyone would be better off if it were produced and distributed. Thus, according to the theory, we need some sort of intervention.

This brings up the third problem. If we are going to have intervention, what should be its form? We know from Hakansson's work that if the information is an input to the production process, then the unknowledgeable people should not be setting the standards. This is because the standards themselves are going to alter the production relationships—the incentive contracts. Unless the people making the rules are knowledgeable about these delicate relationships, the rules themselves will introduce inefficiency in the production process.

This leads to another problem: if knowledgeable people are involved in setting rules, they too have a self-interest in the rules. It would be surprising if the accountants were unlike lawyers and if they had not, by setting accounting standards, discovered the type of make-work that people accuse lawyers of having discovered years ago. We obviously have the potential problems of special-interest capture of a regulatory process. Whether the FASB is or is not involved in such an exercise is controversial. Before we turn to the two papers that address indirectly our understanding of this process, another point needs to be made.

In Hakansson's paper, price information is used to make welfare judgments as reviewers. We do not entirely understand what is going on in the paper; but a problem is hovering in the background of the welfare economics literature related to that type of analysis. The idea is that prices alone might serve as an indicator of the movement, expansion, or contraction of the production function in response to policy changes. A series of theorems by John Chipman and John Moore address this issue from the point of view of an economy. Several different forms of these results are published in *Econometrica*, *JET*, and *International Economic Review*. The results look something like this. Consider two competing equilibria. Assume that at one competitive equilibrium, the nominal *GNP*

measured in terms of both sets of prices dominates that of the other. Now, we want to inquire if such facts can be relied on as an indicator that the real *GNP* is greater at the one competitive equilibrium, in a sense that the people who prefer the one can pay off the other people to make some people better off while nobody is worse off. Does a higher nominal *GNP* on both indices guarantee the existence of a compensation scheme which will achieve Pareto-dominance? The answer is "yes" if and only if people have identifiable homothetic preferences with identical endowments. In other words, it is a very negative result. It suggests that extreme care is necessary in pursuing this line of research.

Let us now discuss the questions raised in the Newman and the Johnson papers. If there are no externalities, there is no market failure. The argument of the Johnson paper is that the U.S. Constitution anticipated that possibility, and we should have relied on the Constitution to protect ourselves from political interventions in the market processes. Somewhere, according to this thesis, the courts failed to interpret the Constitution properly, and perhaps by reviewing history and changing either the courts or statutes the situation can be corrected. In the absence of externalities, property rights and procedures are appropriately defined by the Constitution itself; no additional board or review process is necessary. If there is an externality and the market fails, can we still depend on the absolute rights arguments, such as those in constitutional provisions, that are being advanced by Johnson?

If absolute rights do not foster efficiency, it is natural to turn to some decision-making body such as a committee. Newman raises a critical question: how do we compare the future performance of two different types of organizations when we do not know the type of problems they will face? We are now not too sure what the issues are going to be, what the preferences are going to be, etc., so we are not able to predict or evaluate decisions. Newman uses power indices and related game theory to address that question. We shall discuss another set of tools that has evolved, in part, as a response to the types of criticisms the discussants in this conference have made.

The criticism of the power indices expressed by the discussants is that the indices apply only to zero sum games. Actually, the application is not restricted to zero sum games, but it does require a game model with side payments, in characteristic function form. This requirement boils down to the following: when analyzing a committee process, we can only look at one variable. That variable involves the concept of a coalition. We need not consider the options, the procedures, or the preferences. The only thing that we have to use as a predictive variable is the concept of coalition itself. This concept is a rather difficult one. In experimental work at least, it is very difficult to tell when a coalition forms. We have heard arguments about focusing on voting data to determine if the choice of voting rules makes a difference to decisions. Thus the number of issues that would have passed under the lower voting rule is determined by

counting those issues which were blocked by only a small coalition. The problem with voting data and with this procedure is that the observed votes change with the rule. For example, voting patterns under unanimity and majority rule almost always look similar because votes under the majority rule are frequently unanimous. Why is that? Minority coalitions tend to vote with the majority. When people in the minority recognize that they are going to lose a battle, they do not bother fighting it. So frequently voting data show more harmony than the voting rule might suggest.

Let us turn now to the rules and the institutions themselves. The following examples are taken from the mathematical economics and political science literature and provide useful illustrations of the strength of rules and the structure of committees. They will also help in gaining an understanding of the problems encountered by an application of power index theory to committee behavior.

Consider a committee of three people and three options. How do the rules of a committee affect the outcome? Consider the majority rule and assume that the members of the committee have formed their preferences before meeting to resolve their conflict. In figure 1, individual *I* prefers *x*

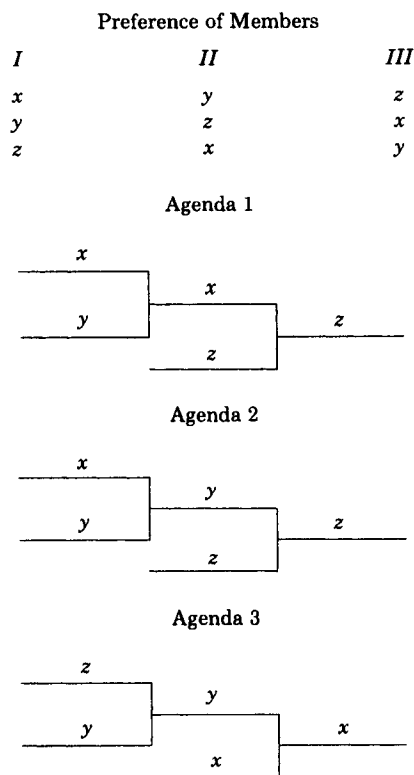


FIG. 1.—Effect of agenda on committee outcome.

over  $y$  over  $z$ ; individual  $II$  likes  $y$  over  $z$  over  $x$ ; and individual  $III$  likes  $z$  over  $x$  over  $y$ . The agenda is as follows.

First,  $x$  is put against  $y$ ; individual  $I$  votes for  $x$ , individual  $II$  votes for  $y$ , individual  $III$  votes for  $x$ . Under the majority rule,  $x$  beats  $y$ . When  $z$  is pitted against  $x$ , individual  $II$  votes for  $z$ , individual  $III$  votes for  $z$ ; the winner is  $z$ . However, if  $x$  is put against  $z$  first, we already know the winner is  $z$ . When  $z$  is put against  $y$ , it is seen early that  $y$  wins over  $z$ , so the final outcome is  $y$ . Suppose we put  $z$  against  $y$  first. We already know the winner in that contest is  $y$ . Put  $y$  against  $x$  next, and we know the winner is  $x$ . The outcome is going to be  $z$ ,  $y$ , or  $x$  depending strictly on the sequence in which the options are introduced.

Groups are often treated as if they had a preference, like individuals. If we advance a behavioral hypothesis that a committee does as it wants, as if it has a preference like an individual, then a problem arises because this "individual" would have very strange preferences. They are cyclical. This type of research suggests that this is the wrong way to think about committees. Groups do not have preferences. They are conflict-resolving bodies, and the choices of groups may have no internal consistency whatsoever, unlike the preferences of individuals.

Let us take another example. Suppose the status quo is  $w$  and that someone proposes  $z$ . It can be seen from figure 2 that  $z$  is preferred to  $w$  by two out of three, so the system moves to  $z$ . Then somebody proposes  $y$ . Then  $x$  is proposed; and again  $x$  is preferred by a majority to  $y$ , so the system ends up at  $x$ . Everything has been democratic. Majority rule was used at each step. Notice, however, that everyone prefers  $w$ , where the system starts, to  $x$ , where the system ends.

Do some rules induce better decisions than others? The sad fact is that all known procedures cause problems of the sort demonstrated by these examples. Some rules assure a Pareto-optimum, but they are all subject to procedural manipulation. As shown by the examples, majority rule has problems on both counts.

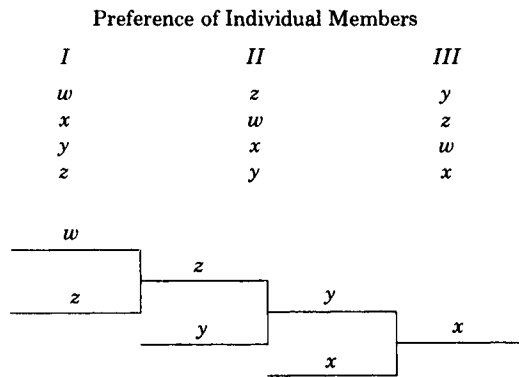


FIG. 2.



The point of this review is to provide some intuition about the importance of rules and subtle aspects of procedure in determining what groups choose. Consider the Borda count as a final example. This is a point voting system. If four alternatives exist, each voter is to assign four points to his/her best option, three points to the next best option, two points to the next best option, etc. Points are then added, and the option with the highest total is chosen. Scoring systems like this are used for many purposes, including personnel evaluation. The seven-person example in figure 3 demonstrates the sensitivity of such choices in the set of options under consideration. With the four options ( $w, x, y, z$ ), the total points are shown in the first column. In this case,  $y$  is the winner with 20 points, and it is followed by  $x$  and  $w$  with 19 and 18 total points, respectively. If the loser,  $z$  with 13 points, had not been considered at all, the results would have been quite different. As shown in the second column, the choice would have been  $w$  with 15 points, followed by  $x$  and  $y$  in that order. The addition or elimination of an unchosen option can cause the ordering of the other alternatives to be inverted by a committee. In other words, the group's preference inverts with the interjection or elimination of options. Readers involved with important committees are probably aware of the potential importance of attempts by people to interject new issues into a deliberation. Frequently one hears, "it's a new issue; let's not discuss it," "that's an alive option which we should keep open," or "we've eliminated enough." Such decisions and arguments are important because the strategic interjection and elimination of options can substantially change the choices made by a committee.

The major point we wish to make is that committee choices can be substantially affected by subtle changes in rules and procedures. The sensitivity to such things is not captured by the power indices. The point can be made a little more forcefully by the use of experimental techniques. For fixed sets of procedures—as opposed to processes in which the rules, as well as the ultimate choice, are endogenous—there is now a body of experimental techniques that we can use to obtain hard data. If one does not believe an assertion, one can discover it for oneself in a controlled environment. Such methods are effective in resolving certain types of conflicts among scholars.

As an outline of how these methods work, suppose five people are deciding among an infinite number of options, points on a blackboard.

Individual Preferences							4 Options	
<i>I</i>	<i>II</i>	<i>III</i>	<i>IV</i>	<i>V</i>	<i>VI</i>	<i>VII</i>	<u>1</u>	<u>2</u>
<i>w</i>	<i>x</i>	<i>y</i>	<i>w</i>	<i>x</i>	<i>y</i>	<i>w</i>	<i>w</i>	18
<i>x</i>	<i>y</i>	<i>z</i>	<i>x</i>	<i>y</i>	<i>z</i>	<i>x</i>	<i>x</i>	19
<i>y</i>	<i>z</i>	<i>w</i>	<i>y</i>	<i>y</i>	<i>z</i>	<i>w</i>	<i>y</i>	20
<i>z</i>	<i>w</i>	<i>x</i>	<i>z</i>	<i>w</i>	<i>x</i>	<i>z</i>	<i>z</i>	13

FIG. 3.

The choice of a point on the blackboard cannot involve any inherent controversy. The way it is made controversial is by assigning to each individual,  $i$ , a function  $u^i(x)$  indicating the dollar reward  $i$  will get should the group choice be  $x$ . No side payment or mention of monetary amounts is allowed. The maximum possible reward ranges from \$10 to \$50, but for some experiments even higher amounts were used. Individual payoffs decrease as the group choice moves further from the individual's ideal point. In the cases we review here, all indifference curves are circular. By prohibiting side payments, the conflict is restricted to two-dimensional space and does not involve who pays off whom. The preference parameters for one set of experiments are as shown in figure 4. The five people all have equal power because majority rule is used. Point  $A$  is the core of a cooperative game model of this conflict, and it is an accurate indicator of what the group will choose. It happens, in this case, to be the best point for one of the individuals, even though, according to the power indices, all individuals have equal power.

The fact that the core is a good predictor has other implications for the ability of people to use groups which appear to be "fairly constituted." Balanced representation on committees is often a subject of protracted discussions. The idea is to obtain representation of all the extremes, to get proper information into the process by allowing all people to be represented. Here is a trick learned from a dean. Let us suppose we have a single issue, represented by the line in figure 5, and a committee is to be appointed. We want the group to choose point  $A$  on the figure, but we cannot force the group to do it. One strategy is as follows.

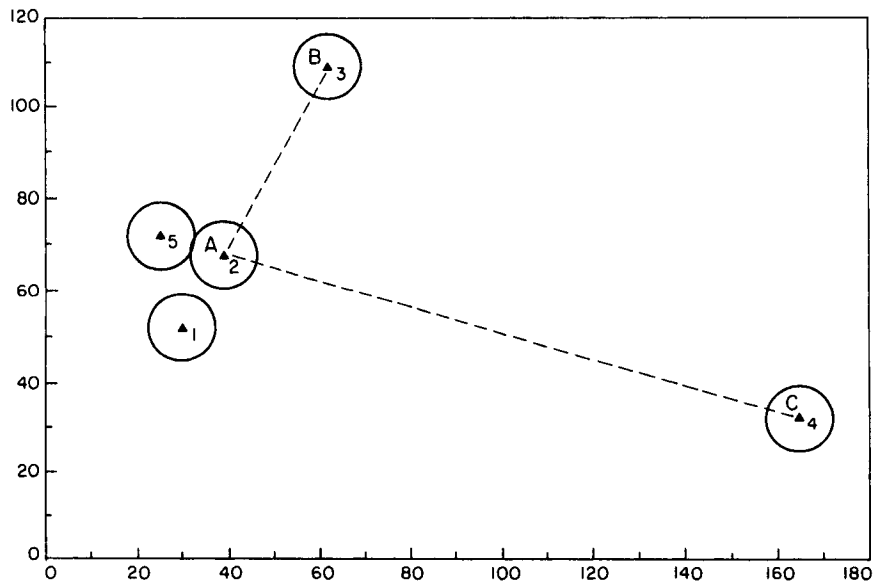


FIG. 4.—Preference parameters and cores. Source: Kormendi and Plott [1980].

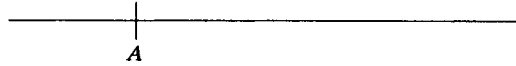


FIG. 5.

We choose someone for the committee whose preferences are like our own, that is, who likes point *A* best. Next, in order to make the committee look fair, we appoint people representing diverse groups; but each time we appoint someone whose preferences are to the right of *A*, we also appoint someone whose preferences are on the left. Even the far extremes can be represented so long as they are in equal numbers on either side of *A*. The point *A* is the core in that it will be the choice of the committee. The committee may look "fair," but you can see how the representation determines choice. This example is a convenient vehicle with which to explore unanimity. Under unanimity, the core is larger. It is the area between the extreme "best points," but behaviorally, decisions do not cover the whole core. Instead, the data will be contained in an area somewhere in the center of opinions. In this one dimension, the set of points between the majority rule core and the means seems to do a good job of predicting outcomes.

Another interesting case is one in which someone has the right to veto. Suppose individual 4 in figure 4 has the right to veto. One example is an individual who has the right to take actions subject to majority rule ratification. Another would be an individual who controls the ability of the group formally to consider motions or amendments. The core becomes a line segment connecting the points *A* and *C*. Figure 6 shows the results of several experiments done at the University of Chicago. It is a good model.

There are other things we know about committees that are not captured by power indices. Certain types of agenda are extremely powerful determinates of group choice. Agendas which form a sequence of partitions can be used actually to determine, within limits, the choice of a voting group. Such an agenda partitions the options into two sets, and the vote is on which set to consider further. With one set eliminated by majority rule, the remaining options are again partitioned for a vote. The choice of options to be grouped into sets (the wording of the motions) is a powerful tool in manipulating groups.

The agenda and other details of procedures are extremely powerful. So our judgments about how decision-making bodies are going to work involve subtle issues. One might think that these are negative results pertaining primarily to majority rule, but there are a series of impossibilities theorems which hold that majority rule has no monopoly on problems. We formulate the idea of what a reasonable process looks like and ask if any exist theoretically. The problem is that every attempt to find one at this general level has met with negative results. So if we are going to say anything at all about the relative desirability of processes, we have to be very careful. There are related results by Buchanan and Tullock,

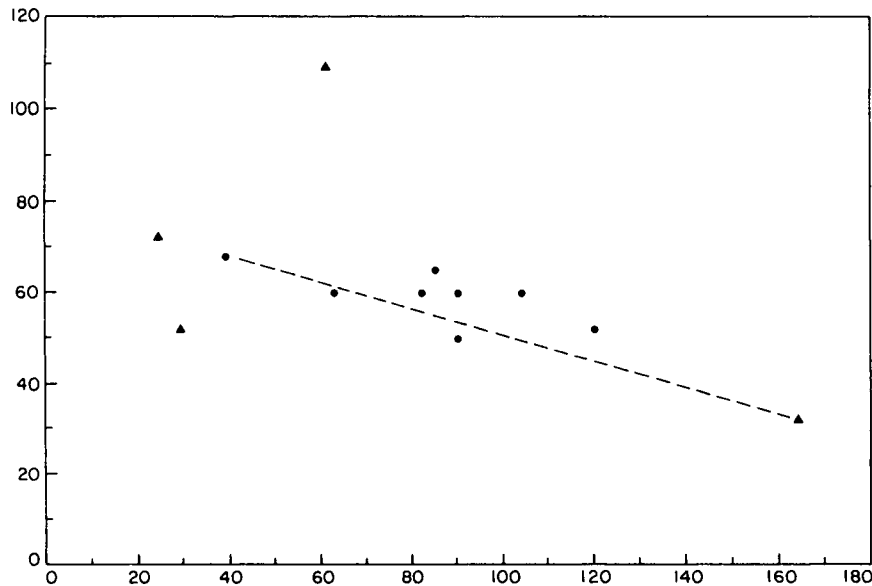


FIG. 6.—Committee choices. Source: Kormendi and Plott [1980].

Rawls, and a few philosophers, but, so far as we know, that exhausts the literature. These scholars have attempted to provide tools with which to evaluate constitutions, rules, or processes. The problem is that processes are going to operate under conditions about which little is known. These efforts, along with the power index literature, summarize the state of the art.

In summary, we find the discussion at the conference interesting in that people have stated nothing about the nature of the market failure that would justify some type of intervention, such as a rule-making body. We have not seen much of that discussion generally, although it would seem to be a necessary analysis accompanying any evaluation of how and what the Board might do. Two other points need to be made. The first is that experimental methodology now exists that can be used to provide some insights into how processes will work. Some data can be generated, but not as much as one would like. The other message is that the problem seems closely related to the work of other disciplines, and many negative results have been discovered. So if one is going to say anything at all, extreme care is necessary. The direct answer to the question is, "No, in terms of choice among games, these indices have not been tested." One of the reasons is that the expectation for success of these models is low relative to other types of models, and the latter have attracted the research effort. In other words, we know that these power indices do not predict well in comparison with the core, for example. They are very sensitive to the preference configurations. Furthermore, there are problems with experimental control. There is no way satisfactorily to control,

for example, expectations about upcoming preference configurations; without control there, it is difficult to get firm predictions from the experimental setting. The literature that comes closest is the work of Al Roth at the University of Illinois. He has been experimenting with bargaining situations and related matters. Carl Castore of Purdue has also worked on this. The other approach to evaluation of processes has been axiomatic—just look at the axiomatic properties of the process and evaluate them. That is the approach of the axiomatic social choice theory. There are many positive theoretic results there. But so far as we know, that is it. That is the universe.

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