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*Horizontal dilemmas*  
*Social choice in a decentralized hierarchy*

If there is any sort of "discretionary power" left to individuals restricting outcomes, we must either give up Pareto optimality or acyclicity.  
Aldrich (1977: 16)

If every individual had complete and perfect information about the effects of alternative outcomes on his or her own well-being, the problem facing society would simply be that of aggregating the differences among individuals. But social decisions also serve the purpose of combining the judgments of individuals, each of whom may have only incomplete and faulty information about the effects of an alternative on his or her own well-being.

Despite the technical advantages of dictatorship as a means of aggregating conflicting individual preferences, dictatorship may do very poorly when the problem is one of making collective judgments about difficult problems. Machiavelli understood that even an absolute prince has to get accurate information and advice from others; hence, the prince has to avoid "flatterers," or advisers we would call "yes men": "There is no other way of guarding oneself from flatterers except letting men understand that to tell you the truth does not offend you" (1513/1952: 33).

The simple fact is that no one person can know enough to program the behavior of all the other members of the firm as if they were robots. As a result, the expertise of specialists becomes a political resource within the firm, one that inevitably results in a dispersion of political power within the organization. The purpose of this chapter is to understand why the delegation of decision-making authority is inevitable within a hierarchical structure and what implications delegation has for the efficiency and unity of hierarchical decision making. The analysis will show that delegation to experts leads to the potential for social dilemmas within a hierarchy, a potential that is the central problem facing the managers of any modern firm.

THE USE OF KNOWLEDGE IN ORGANIZATIONS

In the first half of the twentieth century, one strand of rational economic analysis led to optimistic forecasts regarding the possibilities of centralized planning and decision making under socialism. Just as the "economic theory of the firm" conceived of decision making as the centralized, efficient allocation of resources by the satisfaction of marginality conditions, the planning of the economy was seen as one large optimization problem. Indeed, the theory of the firm was seen as a model for planning under a socialist economy, and the socialist economy could be thought of as a giant firm. If the information conditions could be satisfied, a centralized planner could guarantee a centralized, efficient solution to resource allocation problems in ways that markets plagued by monopoly or externalities could not.

The Austrian economist Friedrich Hayek criticized this faith in centralized decision making. While his criticism was directed at centralized decision making in society, it applies equally well to dictatorial decision making in a firm. In a classic article entitled "The Use of Knowledge in Society," Hayek (1948) begins by criticizing the economic theory of the firm (as applied to socialist planning):

*If we possess all the relevant information, if we can start out from a given system of preferences, and if we command complete knowledge of available means, the problem which remains is purely one of logic. . . . This, however, is emphatically not the economic problem which society [the firm] faces. . . . The reason for this is that the "data" from which the economic calculus starts are never for the whole society [firm] "given" to a single mind which could work out the implications and can never be so given. (77)*

While in the social choice view of dictatorship a single actor's preferences "count," in social decision making no one actor can even know what he or she "wants" without information supplied by other actors. The head of a firm may "want" to make profits, but preferences over any of the action alternatives available to him depend on information that other people must supply. Should Ford Motor Company make a front-wheel-drive car? As Hayek (1948) says:

The peculiar character of the problem of a rational economic order is determined precisely by the fact that the knowledge of which we must make use never exists in concentrated or integrated form but solely as the dispersed bits of incomplete and frequently contradictory knowledge which all the separate individuals possess. (78)

These bits of incomplete information include information about the popular response to front-wheel drive, from marketing; information about the costs, from production; and information about the availability of capital, from finance. "To put it briefly, it is a problem of the utilization of knowledge which is not given to anyone in its totality" (78).

Even if the dictator manages to combine the technical expertise of marketing, production, and finance, that is insufficient, as Hayek points out:

Today it is almost heresy to suggest that scientific knowledge is not the sum of all knowledge. But a little reflection will show that there is beyond question a body of very important but unorganized knowledge which cannot possibly be called scientific in the sense of knowledge of general rules: the knowledge of the particular circumstances of time and place. It is with respect to this that practically every individual has some advantage over all others because he possesses unique information of which beneficial use might be made, but of which use can be made only if the decisions depending on it are left to him or are made with his active cooperation. (80)

Here is the nub of it. Even the most autocratic executives find that they must depend on subordinates with the knowledge of "particular circumstances of time and place." This information monopoly, though of the most trivial kind, makes necessary some degree of delegation or sharing of decision-making authority. This delegation becomes even more essential as conditions shift rapidly:

If we can agree that the economic problem of society [the firm] is mainly one of rapid adaptation to changes in the particular circumstances of time and place, it would seem to follow that the ultimate decisions must be left to the people who are familiar with these circumstances, who know directly of the relevant changes and of the resources immediately available to meet them. We cannot expect that this problem will be solved by first communicating all this knowledge to a central board which, after integrating all knowledge, issues its orders. We must solve it by some form of decentralization. (83-4)

*The advantages of independence in problem solving*

We have Jonathan Bendor to thank for the clearest mathematical exposition of the problems that information asymmetries produce for dictatorial hierarchy. Suppose that a dictator has the ability to make every subordinate in the organization perfectly submissive; why would such a dictator ever grant one or more of those subordinates independent status? If the dictator knew everything there was to know about every problem she faced, there would seem to be no self-interested reason to create an independent (and therefore potentially competitive) force. But without omniscience, omnipotence might be dangerous.

Bendor (1985) begins by assuming that a problem must be solved by finding some critical value  $s$ . He wonders whether two people working separately on the problem (call them  $I$  and  $J$ ) would be more likely to find a successful solution than two people working together (call them  $T$  and  $U$ ). He assumes that each of the four has an equal chance of finding the critical value:

$$p(T > s) = p(U > s) = p(I > s) = p(J > s).$$

### *Managerial dilemmas*

In his fascinating treatment, Bendor assumes that "success breeds success," which would seem to be an argument in favor of two people working together. That is, the conditional probability of one member of a pair coming up with a second successful solution, given that the other member of the pair has come up with one successful solution, is *greater* for the *interactive pair* than for the two people working separately:

$$p[(T > s) \setminus (U > s)] > p[(I > s) \setminus (J > s)].$$

This assumption captures the notion of independence; that is, a person who is working closely with a successful other is more likely to be successful himself.

From this Bendor derives the counterintuitive result that the *independent pair* is *more likely* to find some outcome that meets the critical value than the interactive pair. As Bendor (1985) notes, "Two relatively independent heads are better than two relatively dependent heads" (47).

Bendor uses the laws of probability to deduce that the independence notion implies that one of the interactive pair is *less* likely to have a good idea if his team member does not have a good idea. Thus, if what is important is that at least one good idea occur, the pair working separately is unambiguously more likely to meet that criterion of success. For this reason, the dictator may be driven to creating independent actors, just for the problem-solving advantages that independence provides. A jealous dictator will no doubt seek ways to gain the advantages of independence while creating as small a political threat as possible; and therein lies much of the basis for Machiavellianism. However, a dictator who needs good information and good ideas must create the basis for independence inside the hierarchy.

#### *The subordination of hierarchical authority*

Bendor's analysis suggests that independence in problem solving increases the likelihood that a successful solution will be found. However, suppose two alternatives are generated by two independent units in a bureaucracy, and there is a difference of opinion about which of the solutions is superior. The existence of these independent "brain-storming" units within a hierarchy does not necessarily lessen the authority of the would-be dictator. Surely the dictator will refer to her own judgment in deciding the merits of the alternatives generated by her problem-solving staff.

But the same kind of analysis that justifies the existence of independent problem-solving agents within the hierarchy also requires the outright subordination of the dictator to others' judgment; for the possibility of human error can best be corrected by subordinating the judgment of the dictator.

This result was first formally established by the Marquis de Condorcet in an attempt to ascertain how groups could best make choices. In what be-

### *Horizontal dilemmas*

came known as the "Condorcet jury theorem," Condorcet assumed that each citizen has a probability of choosing the alternative that is better for the organization as a whole. As long as the average probability of making the right choice is greater than .5, the probability of the group majority being correct increases to 1 as the group gets large (Grofman and Feld 1988).

It is advisable to limit dictatorial authority even if a dictator's advisers are no more expert than himself. Suppose, for example, that a dictator and each of his two subordinates independently have a 60 percent probability of making the correct judgment. All three individuals would be better off if the correct judgment were made. Why should the dictator ever defer to his subordinates, who are no more expert than he? If the dictator agreed to be bound by majority rule, the correct judgment would be made 65 percent of the time; that is, the majority judgment would be a 5 percent improvement over any one of them making the decision autonomously. In particular, on those occasions in which the dictator had a different opinion than his two subordinates, the two subordinates would be correct 60 percent of the time, and he would be right only 40 percent of the time. As the number of independent advisers increased (each with a 60 percent chance of being correct), the probability of the majority being correct would come as close to 1 as necessary.

The implications of this result for hierarchy are enormous. Not only will a smart dictator, it seems, have to rely on staff to generate alternatives from which to choose, as Bendor argues; in matters of judgment, the dictator will be better off deferring to group opinion in choosing among those alternatives. Furthermore, the benefits of deferring to majority opinion occur only if the voters are truly independent and not mimicking the dictator. This suggests that subunits of a hierarchy not only must be regarded as brain-storming offices, but should often have real power in the selection of alternatives.

The case for deferring to subordinates is even stronger if the subordinates are true experts. Suppose the dictator and one assistant each have a 60 percent chance of being correct in matters of marketing, but the marketing assistant has an 80 percent chance of being correct in such judgments. Because of the subordinate's expertise, majority rule is an even greater improvement over dictatorial decision making; a majority will be correct 74.4 percent of the time, instead of 65 percent of the time. However, majority rule can be improved on: The dictator would do better to defer to the expert alone and get a correct judgment 80 percent of the time. As variations in the ability of the individuals became more pronounced, the majority judgment of the group would be likely simply to water down the quality of decision making by the expert.

For these reasons, as problem solving and decision making in an organization become much more complex, those individuals who have expertise not only will be called on to exercise this expertise, but will increasingly

### *Managerial dilemmas*

manage to secure a real share of decision-making authority. With complexity comes delegated decision making.

#### *The political challenge to dictatorship*

The mathematical arguments against dictatorial judgments have been anticipated by the behavioral literature on organizations, which for much of the twentieth century has documented the emergence of pluralist decentralization in hierarchies. The primary explanation of the phenomenon of pluralist, decentralized decision making in hierarchies has been the notion of "dual authority" — whereby formal, hierarchical authority is challenged by the authority of expertise.

Mary Parker Follett (1940), one of the earliest critics of monocratic hierarchy, asked, "How can you expect people merely to obey orders and at the same time to take that degree of responsibility which they should take?" Implicitly, she was arguing that, when one delegates the responsibility of implementing a decision in a given dimension, the price a superior has to pay for cooperative and conscientious implementation is some deference to the wishes of the subordinates. Suddenly, the door is opened to bargaining between superiors and subordinates.

Max Weber (1946) also argued that hierarchical authority does not lead to dictatorship when he pointed out that "the 'political master' finds himself in the position of the 'dilettante' who stands opposite the 'expert,' facing the trained official" (232). That this expertise becomes a power base, carefully guarded by the experts, is obvious to Weber: "Every bureaucracy seeks to increase the superiority of the professionally informed by keeping their knowledge and intentions secret" (233).

#### THE HISTORICAL LIMITS OF DICTATORSHIP IN HIERARCHY

Thus, despite the most serious intentions of autocrats like Henry Ford, the U.S. firm has been transformed from a centralized to a decentralized hierarchy. The firm is thoroughly embedded with nests of specialists, each slowly leveraging its own brand of expertise into positions of shared authority and power.

#### *Impetus for delegation: engineers and scientific managers*

The pioneers in this movement toward expertise and shared authority were professional managers who felt that many of the firm's decisions should be delegated to them. Foremost among these, of course, was Frederick Taylor. Taylor was an engineer who became convinced that the high-flying entrepreneurs and capitalists who ran the late-nineteenth-century firms made

### *Horizontal dilemmas*

abominable managers. They were, he believed, wasting a good deal of the firm's resources through sloppy management and a loose reliance on "traditional" and commonsensical manufacturing procedures.

His experiments on metal cutting demonstrated the "one best way" of performing that vital manufacturing operation and won him worldwide acclaim. Taylor felt that careful, methodical experimentation could reveal the "one best way" of performing any task that a firm might face, from stoking coal to administering a personnel system. He formulated his ideas under the title "scientific management" and soon had a devoted following of engineers who were trained in his techniques.

Taylor placed the blame for inefficiency on management and implied that any failure to adopt his system was a sign of selfish bullheadedness on the part of short-sighted owners. Owners quite clearly and accurately perceived that their authority and discretion as entrepreneurs were being challenged by engineers, who, after all, had no capital at risk and were supposed to be their employees.

One of the areas in which Taylor was most insistent that authority be transferred was personnel administration. Traditional practice included virtually no careful selection of applicants, no training, and no statement of employee responsibilities and rewards. In many establishments, people seeking jobs simply appeared at the gates in the morning and evening, and a foreman needing more help would select someone from the crowd and give him a chance to demonstrate his abilities on some task.

Taylor felt that scientific management required the identification and selection of the right person for each job and that one of management's primary responsibilities was adequate training. This concern became increasingly popular as the old "driving" method of foremanship resulted in growing labor problems and as the necessity of finding and training a labor force for a more technologically complex physical plant increased (Taylor 1911, 1947).

As an example, the driving foreman of the brass foundry at National Cash Register fired union molders in his shop, precipitating a strike and then a lockout in 1901. After the dispute had ended, Chief Executive Officer (CEO) John Patterson appointed personnel reformer Charles Carpenter to create the "first modern personnel department in American industry" (Nelson 1975: 109). One of the first acts of the Labor Department, as it was called, was to deprive foremen of the ability to fire employees unilaterally or arbitrarily. By systematizing labor contracts and handling disputes over wage inequities, it also destroyed the authority of foremen over their subordinates' compensation.

All of this was done with the intention of "strengthening management," and it was sold to Patterson and other bosses at National Cash Register in this way. However, the management that was strengthened was no longer a single, unconstrained boss at the head of a simple linear hierarchy, but a

### *Managerial dilemmas*

multifaceted "administration" composed of production experts with their stopwatches, personnel experts with their wage contracts, and lawyers, marketing specialists, and numerous other staff members. The CEO, sometimes without even knowing it, was gradually put in the position of being told by various staff experts what was "impossible," "illegal," "inappropriate," or "bad policy."

Thus, despite the fact that Taylorism was widely seen to be strengthening management, it was also responsible for transforming management into a modern team in which power was delegated to and shared by a variety of specialists. It was for this reason, no doubt, that Taylorism was ignored or heartily condemned by many business leaders of the day. Even when scientific management was given a trial in a plant, management often decided it didn't like what it did to its own prerogatives. Where it was tried,

the experts encountered more opposition from managers than workers. In some cases it came from the highest levels. Scientific management was often introduced in the course of a power struggle between the younger and older members of the management group or as a part of a larger reform program after the younger men had taken over. (Nelson 1975: 75)

The superiority of expert, delegated management became the basis for a constitutional shift in power relations, replacing the dictatorship of the entrepreneur.

### *Accountant autonomy*

A striking example of the increasing constraints and decentralization in the firm was the rise of independent accountants. During the first part of the century, accountants had been regarded as mere bookkeepers whose job was to supply the figures the boss wanted, even if they were "cooked":

Because their profession had labored for years to escape the tight grip in which corporate management held it, most accountants ardently wanted to exercise, in fact, more of that "independence" they claimed to be essential to good accounting practice. Corporate managers, lacking respect for such independence, often tried to dictate to the auditors, encouraging them to shade the truth or even to misrepresent the state of a company's financial health. (McCraw 1984: 190)

Even more than labor and social legislation had increased the independence and authority of personnel experts, the securities legislation of the New Deal gave accountants an opportunity to guarantee an autonomous position in the firm. When regulator James Landis indicated a willingness to grant the accounting profession a large degree of self-regulation, the profession quickly joined the coalition of those supporting securities legislation. One accountant wrote that, because of the new legislation, "no longer must the public accountant single handedly strive against the prejudiced desire of the officers of clients for what he believes to be fair and correct pre-

### *Horizontal dilemmas*

sentation of the facts in the financial statements." Another wrote: "The control function of accounts takes on a new and quite different form. Instead of being merely a tool of control by business enterprise they become a tool for the control of business enterprise itself" (McCraw 1984: 190). The accountants, along with the production experts and personnel managers, became another center of autonomous, delegated political authority in the hierarchical firm.

### *The multidivisional firm*

The examples presented thus far confirm that top-level managers were constrained to delegate decision-making authority to engineers, personnel administrators, accountants, and other technical staff members. But even more fundamental than this, managers were eventually forced to make wholesale grants of authority to subordinate line officers – officers with general operating authority and responsibility for a large proportion of the firm's core production activities.

The classic account of this devolution of authority is Chandler's *Strategy and Structure* (1962). Among other cases, Chandler cites that of Du Pont, which by early in the twentieth century had developed a very strong, centralized hierarchy with functional departments for production, purchasing, sales, and so on. During the First World War, Du Pont embarked on a strategy of diversification, moving from the traditional base in ammunition and explosives into dyes, paints, and other chemicals. As it turned out, the imposition of a standard marketing strategy for these very different kinds of products was ineffective. Du Pont discovered it was losing money in these products, even though less diversified competitors were making money. As Chandler (1962) noted, "The marketing of consumer goods demanded a new and more extensive type of advertising 'with a direct appeal to the consumer' and the creation of an enlarged national distributing organization including, possibly, even retail outlets" (93).

Coordination along product lines, but across the functional departments, was proving impossible. "The activities of each line within each functional department were effectively managed, but no one was responsible for administering them so as to assure a profit on each individual line of products" (96). This was especially the case since the peak of the functional hierarchy was serving as a bottleneck to cross-functional coordination. Furthermore, the top executives did not have the information they needed to invest capital across different product lines. The functional lines gathered accounting information in such a way that it was impossible to determine return on investment for different product lines.

As the crisis worsened, a group of young executives drew up a proposal for creating two or more "practically self-contained" divisions. The divisions would handle sales, purchasing, production, and accounting sepa-

### Managerial dilemmas

rately. Lines of accountability were drawn from the divisional managers to the president; however, the delegation of authority to these divisional managers was great. For instance, the proposal stated that the divisional manager should give monthly financial reports to the president. Certainly this degree of accountability would leave the president in a position to fire inadequate managers; however, this reactive stance was quite different from the conception of the president as first decision maker in the firm. The president was put in a position of having to approve or disapprove of an unknown number of decisions made by someone with substantial delegated authority.

#### Delegation and interest aggregation

The creation of personnel offices, the development of autonomous accounting staffs, and the spread of multidivisional firms are just some of the more striking examples of the delegation of authority to experts in organizations. With the acceleration of technological change in industry, firms have found it necessary to incorporate pockets of specialists in engineering, biology, advertising, finance, and virtually every other discipline – and to vest these specialists with decision-making authority.

This would pose no problems if each specialist simply used his or her expert judgment to advance the firm's best interests. But experts end up having different preferences than the rest of the firm, as well as different levels of expertise. The authority that is delegated to experts inevitably gives them some opportunity to advance their own interest. For the firm, this means that the advantages of dictatorship so clearly captured by the Arrow theorem – coherence, efficiency, and consistency – will be at risk. As pockets of delegated authority spread within the decentralized firm, keeping the firm on a unified coherent course will become ever more difficult.

#### THE SEN PARADOX: TRADE-OFFS IN A DELEGATED HIERARCHY

What kinds of trade-offs must be made in decentralized hierarchical decision making? Another impossibility result, known as the Sen paradox, will provide a good deal of insight about the nature of trade-offs in hierarchies (Sen 1970, 1976, 1983). Loosely paraphrased, it says that any organization that delegates decision-making authority to more than one subset of individuals must suffer from either incoherent behavior or inefficiency for some combinations of individual preferences.

In practice, all large organizations involve some degree of delegation. Chief executives find it necessary to grant authority to a large or small number of specialized subordinates to make some decisions for the organization. In a more centralized firm, these delegated decisions are fewer and

### Horizontal dilemmas

Table 4.1. *Decentralized choice at Apex, Inc.*

<i>Apex must choose one of four alternatives:</i>		
	Production technology I	Production technology II
Marketing strategy A	$x$	$y$
Marketing strategy B	$z$	$w$

*Organizational decision procedure (minimal delegation):*  
Marketing specialist Smith is decisive for the pair  $(x,z)$ ; the boss, Ms. Doe, is decisive for all other pairs

<i>Transitive individual preference orderings:</i>		
	Mr. Smith	Ms. Doe
	$y$	$x$
	$z$	$w$
	$x$	$y$
	$w$	$z$

*Intransitive social preference ordering:*  
 $z$  beats  $x$  (Mr. Smith is decisive)  
 $y$  beats  $z$  (by Pareto optimality)  
 $w$  beats  $y$  (Ms. Doe is decisive)  
 $x$  beats  $w$  (by Pareto optimality)

more trivial than they are in other firms, but delegation exists in any large firm. The decisions of the subordinates with delegated authority contribute to the final organizational decision.

As an example, let us consider Apex, Inc. Apex has to decide between two possible production technologies and two possible marketing programs. Any production technology can be combined with any marketing program, so there are four possible overall strategies. These choices are shown in Table 4.1. Everyone in the firm has his or her own opinion about the relative merits of the four strategies. In particular, let us suppose that there are two individuals in the organization. Because of his superior expertise, the marketing vice-president, Mr. Smith, has been delegated the authority to rank-order outcomes  $x$  and  $z$ ; that is, if production technology I is chosen, Mr. Smith gets to decide between marketing strategy A and marketing strategy B. The boss, Ms. Doe, gets to rank-order all other pairs of alternatives.

This organization, then, is not a complete dictatorship. It is minimally decentralized in that one person other than the boss has the authority to make decisions about some aspects of the group choice. From a social choice perspective, the problem with delegated hierarchies is that, because they are not complete dictatorships, they logically violate some other desirable characteristic of social choice. The Sen paradox reveals that hierarchical delegation requires trade-offs between the following characteristics:

*Universal domain.* As with the Arrow theorem (Chapter 3), the organization should be able to make choices for all possible combinations of individual preferences. No combination of individual preferences should leave the organizational choice undefined.

*Pareto optimality.* For all pairs of alternatives  $x$  and  $y$ , the organization should choose  $x$  over  $y$  if everyone in the organization prefers  $x$  over  $y$ . Once again, this is a weak requirement that says nothing about what the organization should decide in the case of disagreement. It simply says that unanimous agreement should be reflected in the final outcome.

*Transitivity.* If the organization prefers  $x$  over  $y$  and  $y$  over  $z$ , then it should prefer  $x$  over  $z$ . Once again, this seems to be a minimal requirement for any kind of consistency or meaning in group choice. This requirement is also known as acyclicity.

*Minimal delegation.* There are at least two individuals or discrete subgroups in the organization, each of whom has the authority to rank-order at least one pair of outcomes. The Apex corporation has minimal delegation because Mr. Smith, in addition to Ms. Doe, has the authority to determine one pair of rankings.

The Sen paradox states that these four minimally desirable characteristics in a hierarchy are mutually inconsistent. That is, in any organization with minimal delegation, there will be some combinations of individual preferences that lead to either inefficiency or intransitivity in group choice.

As an example, suppose that Mr. Smith and Ms. Doe have the preferences shown in Table 4.1. The hierarchy's social preference must be as follows: By Pareto optimality,  $y$  must beat  $z$ , and  $x$  must beat  $w$ ; the reason is that both actors agree on these rankings. By minimal delegation,  $z$  is ranked higher than  $x$  because Mr. Smith's expert opinion in this area is determinative. And finally, Ms. Doe has the authority to rank  $w$  over  $y$ . Putting these four outcomes together, we have a set of circular (intransitive) preferences for the hierarchy: Apex believes  $x$  is better than  $w$ , which is better than  $y$ , which is better than  $z$ , which is better than  $x$ .

Because the hierarchy has intransitive preferences, there is no single choice the organization can make that is consistent with its "constitution" or rules of procedure. If it chooses outcome  $z$  or  $w$ , then it is choosing an

outcome that both members of the organization can agree is inferior. If it chooses outcome  $y$  or  $x$ , then it is violating the organization's allocation of decision-making responsibilities – such a choice would be "illegal" given the organization's structure.

For any possible organizational delegation of decision-making power, this problem will necessarily arise for *some* possible set of individual preferences. But the universal domain condition requires us to ask what would happen under every possible set of individual preferences. And the overwhelming fact of the Sen paradox is that, as long as there are two subgroups in the organization that specialize in separate aspects of the organization's decision problem, there must *always* be some sets of individual preferences that require a choice between Pareto optimality and transitivity.

#### HORIZONTAL SOCIAL DILEMMAS: PARETO SUBOPTIMALITY IN DECENTRALIZED ORGANIZATIONS

Every delegated hierarchy must violate Pareto optimality, transitivity, or universal domain. Each possibility carries with it a set of unpleasant organizational problems. Organizational design in delegated hierarchies necessarily involves trade-offs between various kinds of unpleasantness (Hammond and Miller 1985).

One possible outcome is simply a violation of Pareto optimality: That is, each of those actors with authority over some set of decisions facing the organization makes what he or she thinks is the best choice for the organization, but the net result is an outcome that no one likes. For instance, boss Doe chooses production technology I, and marketing specialist Smith chooses marketing strategy B, and the result is outcome  $z$ . Each has acted in a way that is consistent with his or her own preferences, and yet both can agree that some other alternative (e.g.,  $y$ ) would be better. The outcome  $z$  is stable, but inefficient. Because of delegation, individual self-interest will be inconsistent with the firm's best interests.

This is, of course, an ironic outcome, since the purpose of the hierarchy, as discussed in Chapter 1, is to "solve" social dilemmas in nonhierarchical teams. Hierarchy may make efficiency gains *relative* to nonhierarchical teams, but the meaning of the Sen paradox is that no specialized hierarchy (satisfying universal domain) can be immune to the kind of social dilemmas it is intended to solve. The empirical literature on hierarchies – especially the literature of sociology and social psychology – is full of examples of inefficiencies, often called "bureaucratic dysfunctions." While the behavioral literature on bureaucratic dysfunctions does not often describe it this way, the inefficiency generally arises when various subunits of the organization pursue their own interests within their traditionally defined spheres of delegated authority.

## *Managerial dilemmas*

### *Inefficiencies in multidivision firms*

A classic example of self-interested subunit behavior aggregating to inefficient bureaucratic behavior, as predicted by the Sen paradox, can be found in the multidivision firms created in the mid-twentieth century. Chandler's discussion of these firms, referred to in Chapter 3, shows why the creation of a division structure in large firms was virtually an inevitable result of the inability of centralized executives to coordinate product lines across functional departments. The multidivision firm solves this problem neatly, but opens the door to other kinds of problems.

Chandler describes the vigorous decentralization of Sears under General Wood in the thirties and forties. The Sears stores were divided among five regional divisions – virtual fiefdoms – that were granted complete operating autonomy:

In the spirit of decentralization, each vice-president in charge of one of the five sovereign territories developed his own administrative procedures. Each had authority to design and “drop” his own new stores. They could take out bank loans at will. They protected the right of local store managers to price the goods and select the things they wanted to carry from the warehouses. They could structure a staff around themselves in whatever way they liked, and even after the territories each employed over fifty thousand people, the territory kings preferred to dole out raises and bonuses personally to even the most junior executives. The territories had gained so much control over company communications that corporate directives from Chicago were rewritten when they weren't thrown away. Muscle flexing in the form of subverting the slightest hint of administrative control from the Parent organization became a regular Field pastime. (Katz 1987: 17)

This attitude was passed down to individual store managers as well.

Decentralization was pursued even within the central organization. The buyers handling different product lines were expected to develop an intuitive feel for what would sell in middle America and were granted a great deal of autonomy in pursuing “hunches” that the central staff would not presume to second-guess. Sears buyers were known to sign enormous contracts with small-time entrepreneurs – turning them overnight into huge manufacturing enterprises like Schwinn Bicycles and Whirlpool (Katz 1987: 33). When one buyer invested in kerosene refrigerators that turned out to heat rather than cool food, he thought he would be fired. Instead, General Wood assured him: “A buyer has to venture. I hope you don't lose such a sum again, but I don't want this experience to inhibit you. You have to venture. A good Sears buyer has to assume the risks” (34).

This grant of operational autonomy in the field and among the central buyers encouraged a vigorous pursuit of profits at each of these levels. However, it was not clear whether the pursuit of profits in each store, region, and buying line would necessarily be efficient for Sears as a whole. By the early seventies, profits and market share were dropping in the face

## *Horizontal dilemmas*

of competition from chain discount stores and even from the small shops in the shopping malls that Sears anchored. A share of Sears stock fell from \$90 in 1974 to \$60 in 1975.

The problem that began to emerge in the seventies had the common feature that some eminently rational behavior by a subunit carried large negative externalities for the firm as a whole. For instance, individual store managers were frequently tempted to use illegal “bait-and-switch” marketing techniques in which customers were lured into a store by advertised low prices on individual items, only to be told that the store was “temporarily sold out” of those items and offered higher-priced goods. Because of the company's long-term reputation for integrity, customers were willing to believe that individual Sears stores were operating in good faith. However, that reputation was an exhaustible good that could ultimately be used up by the self-interested actions of some of the managers. Individual store managers were free-riding on the Sears reputation for integrity, and the cumulative effect was to erode the value of that asset. The result was a bait-and-switch scandal in the fall of 1973, culminating in a complaint by the Federal Trade Commission.

At the same time, Sears was charged with racial and sexual discrimination in hiring; the hiring procedure, like individual store advertising policy, was highly decentralized: “Over a thousand people spread all over the country [could] hire people as they each saw fit” (Katz 1987: 24). The central executives were embarrassed, in no small degree because of their own powerlessness:

They also knew that despite government threats, they could do little to stop the practices. So much power had been ceded downward from level to level, from territory to group to store, that no officer in Chicago or even the territory kings could make local store managers do much of anything at all. (24–5)

The same decentralization was creating inefficiencies in the central staff units. Sears was among the last retailers to move into the use of computers simply because the vice-president of operations had complete authority to make the decision, and he wanted nothing to do with the “goddamned new-fangled things” (28). The delegation of authority in Sears was resulting in a firmwide “social dilemma” in which self-interested, protective actions by a variety of store officials were aggregating to outcomes that all could agree were disastrous.

### *Horizontal conflict at Sears*

Both the field and the buyers' organization had an enviable record in socializing their members. The field members were convinced that they were the lifeblood of Sears, the people who hustled the goods and brought in the money. They believed that sales personnel needed a free hand if their



### *Managerial dilemmas*

instinctive feel for the territory and its customers was to be fully effective. The field valued the “merchant” –

a sales soldier with wings, a sort of retail mystic, who could see a sale coming a mile off. A great merchant could look at an item and know in a glance how many Americans would want to buy it – and the best of the great ones wouldn’t ever be able to tell you why. (Katz 1987: 31)

The merchants of the field considered themselves superior to the buyers in the Sears Tower. In the decentralized world of Sears, there was no hierarchical relationship between the field and the buyers – the merchants in the different regions were not forced to carry the goods purchased by the buyers. Theirs was essentially a horizontal, market relationship. But the buyers on the other side of the internal market had a different set of values and beliefs:

If the store runners of the Field saw themselves as foot soldiers, . . . then the Sears buyers were like hunters. Discipline and conformity were subsumed in an appreciation of atavistic instincts, hunches, and tour-de-force gestures. Badges were won less for big dollar profits at the end of the year than for brilliantly conceived buys. (Katz 1987: 34)

As the last phrase suggests, the buyers were motivated in large part by the need to establish and enhance their professional reputation within the association of buyers – and this was not necessarily the same as doing what was best for Sears as a whole. For decades the buyers resisted the introduction of sophisticated market research, because their organization valued those who were gutsy enough to take large risks based on an instinctive “feel” for the industry.

Moreover, the tribal conflict between the field and the buyers did not always result in smooth communication, coordination, or planning between these two core subunits. For instance, the buyers, who exercised great market power in their purchases from Sears suppliers, were able to obtain many goods at very low prices, which meant that Sears stores could obtain goods cheaply, sell them at very low profits to a large number of customers, and still make large profits. The buyers looked good when they purchased goods that were sold in large quantities. However, the Sears field men often marked up the prices in the hopes of making greater profits (which made them look good), and sometimes this resulted in slow sales, making the buyers responsible for those purchases look bad. Thus, there was a long-standing and very costly conflict: buyers trying to force field men to “push the goods” through prolonged and low-priced sales, field men trying to keep local revenues as high as possible by marking up prices.

Eventually, the buyers contrived an ingenious way to obtain power over the field. They arranged with Sears suppliers, with whom they had very close relationships, to “overbill” the store managers. That is, the store managers were charged more than the Sears purchase price; the suppliers got

### *Horizontal dilemmas*

the true purchase price and the difference went to the buyers in Chicago. For example, if Sears was buying a hammer for \$10, the Sears store manager might have on his books a purchase at \$12, and the Sears buyer would have the sum of \$2, in what was known as a “599” account. The buyer would then distribute this money to different Sears store managers as he saw fit. Because the buyer controlled the distribution of this profit, however, he could use it to “bribe” store managers to put the goods that he was purchasing on sale, to advertise them heavily, and to keep them on sales for a prolonged period of time (Katz 1987: 54).

In effect, this represented a monopoly distortion of the market relationship between Sears buyers and stores. There was absolutely no guarantee, or any special reason to think, that this bribe money would be used by the Sears buyers to pursue profit-maximizing marketing strategies. It was simply used to enhance the prestige of the buyers within their professional domain. The buyer for washing machines might have a large “599” account as a result of his market power with respect to purchasers; he would use that account to promote advertising for washing machines, despite the fact that the advertising money would be much better spent on a less saturated market.

In fact, the “599” account was a major reason that decentralization came to an end at Sears. In the midseventies, the central office realized that Sears was losing market share to discount stores and mall boutiques and that Sears had no systematic or effective marketing response to this threat. Because the advertising and promotional budget in the field was supplemented in an unknown way by the “599” accounts, the center did not even have the information necessary to engage in effective planning. The vice-president of planning, Phil Purcell, found that the system

made it impossible to see which items were selling well in the Field or which buyers were buying well, because 599 dusted everyone’s tracks. Purcell couldn’t locate the real promotional costs of the goods or the costs of markups or markdowns. . . . He couldn’t draw a bead on market share. Every numerical indicator was tainted by politics and history and held close to the vests of guys named Doc and Charlie. (Katz 1987: 85)

The “599” account system and the decentralized autonomy of the field and buyers were rooted out during a long and painful process by a centralizing management in the late seventies and early eighties.

### *Inefficiency, transitivity, and decentralization*

Given problems of this kind, the “bite” in the Sen dilemma is very real. At Sears, delegation had resulted in subunit vigor, but overall inefficiency. Restoring efficient practices would involve changing the pattern of delegation and decentralization that had been valued by the company for years.

### *Managerial dilemmas*

The central executives obviously needed to intervene in the operations of the stores, to stop discriminatory hiring, and to bring to a halt the destructive bait-and-switch practices. This would require a constitutional change in corporate governance that would effectively eliminate local control over hiring and advertising practices. The process of implementing this constitutional change was begun with the appointment of reformer Ed Telling as the new chairman of the board in 1977. Telling undertook a "palace coup" that effectively eliminated the old autonomy of the field vice-presidents. He did this before he was even officially installed, by taking the unheard-of action of deposing the vice-president in charge of the Pacific division.

### *Dictatorship versus delegation*

The analysis so far seems to leave us with two equally unacceptable choices: Centralized dictatorship is untenable because of its failure to generate sufficient diversity or sufficient problem-solving strategies; decentralized delegation is untenable because of free riding and destructive externalities. Is there any way out?

The Sen paradox offers one way – which will be explored in the remainder of this chapter and in succeeding chapters. The trade-off between delegation, efficiency, and transitivity occurs for only *some* of the combinations of individual preferences that may exist when members of an organization are allowed to articulate any of their individual preferences. It is the universal domain condition that necessitates this all-encompassing acceptance of individual preferences. For instance, if every individual in a firm always had identical preferences, then making decisions for the firm would be easy. Any set of decisions could be delegated to any subordinate with the assurance that efficient, transitive preferences would always result. If members of a hierarchy could be prevented from having problematic differences of opinion, there would be no dilemma: Hierarchies could resolve public goods inefficiencies, information asymmetries, and other market-confounding dilemmas with ease.

Of course, the same thing could be said of markets. They, too, could operate efficiently if we could be assured that people would not bring the "wrong" combinations of individual preferences to the marketplace. But the whole purpose of a market is the sovereignty of individual tastes: The market exists to respond to the preferences of the customer. The hierarchy, in contrast, does not operate on the basis of a philosophical dictum that employees' preferences, no matter how diverse, are inviolate.

Seen in this perspective, it is clear that in terms of efficiency, the advantage of the hierarchy over the market (if it in fact exists) exists because of the superior ability of the hierarchy to shape and mold individual preferences into patterns that are mutually consistent. We will explore the possibilities inherent in violating the condition of universal domain – that is,

### *Horizontal dilemmas*

constraining or changing the preferences of the actors involved so that self-interested, decentralized action will not result in inefficient or intransitive group choice.

### RESTRICTING INDIVIDUAL PREFERENCES IN HIERARCHIES: SELECTION AND ADVERSE SELECTION

So far, in all of the discussion about inefficiency and intransitivity in decentralized organizations we have assumed that the condition of universal domain is not violated. That is, we have assumed that the organization's decision rule is defined for all possible sets of individual preferences. But what if the organization somehow violates this condition, by screening out the problematic sets of individual preferences? Does such a violation of the condition of universal domain offer hope for reconciling efficiency, stability, and delegation in hierarchies?

Restricting individual preferences is in fact the only way to combine the advantages of delegation in a hierarchy with the requirements of Pareto optimality and transitivity. The most obvious means for doing so is selection: choosing people who will have the "right" preferences.

### *Selection and adverse selection*

In markets and electoral bodies, assuming such restrictions on individual preferences is simply inadequate if the assumption turns out to be false. If a consumer happens to object to another consumer's cigarette smoke or a voter happens to have multi-peaked preferences, there is nothing to be done but give up on the certainty of efficient, stable equilibria. Neither a market nor a legislature can require its members to change their preferences.

In a hierarchy, however, restrictions on individual preferences are a frequent element of organizational design. Hierarchies take it upon themselves to select members who have compatible preferences. For instance, firms try to identify highly motivated, competitive individuals; such people, it is assumed, will be less likely to engage in the shirking that threatens to produce a social dilemma in every firm. The more the employee is expected to work autonomously, as a salesperson operating in the field, the more important such selection processes become.

The ability to select people who have a high preference for work, initiative, and loyalty is limited by the information asymmetries that were discussed in Chapter 1. The problem, of course, is the market-for-lemons problem. Let us assume that there are a large number of applicants for the position of sales representative for a firm. For some, such a job has great psychic costs. For others, not only are the psychic costs low, but many aspects of the job, including making a sale, are enjoyable.

### Managerial dilemmas

By hiring people of the latter type, the firm gets more effort for the same pay. It would like to be able to identify such people with certainty; however, the information is in some sense internal to the applicants and undetectable. Hard-working applicants would like very much to prove their worth; however, any statements they might make regarding their enjoyment of work could as easily be made (falsely) by lazy applicants.

The result is that the market failure in the market for lemons is re-created in labor market failure. The firm would be willing to pay more for highly motivated workers or more productive workers, but cannot do so. As Spence (1974) has shown, the employer will pay each kind of employee the *expected* marginal product, which is the same for productive and nonproductive applicants — as long as there is no way of distinguishing one from the other.

#### *Overcoming the information asymmetry: signaling and certification*

Consequently, businesses would like very much to be able to overcome the information asymmetry that keeps them from selecting people with desirable utility functions. To the extent that they can identify the “hidden” types — hard workers and loyal employees — they can more confidently delegate authority to subordinates *without* triggering the Sen paradox results of inefficiency and/or intransitivity.

Just as a mechanic can offer his services to certify the value of a used car, thus ameliorating the information asymmetry problem in that market, there are various signals by which job applicants can certify their “type.” Perhaps first and foremost is education. The salary that a graduate of an MBA program can secure is much higher than that which a high school graduate earns. Part of what is being paid for is training; but part is certification of initiative and motivation. Similarly, previous work experience, even when irrelevant to a new job, demonstrates the capacity of an applicant to show up at work regularly and perform a minimum amount of work.

In the labor market for lemons, the psychologist is the closest analogue to the car mechanic. A psychological test, the Thematic Apperception Test, or TAT, is used to isolate a high need for achievement (*n-ach*) (McClelland 1961). Other tests have been developed to isolate a variety of desirable traits in employees. Sears, for example, gave a \$50,000 grant to the famous University of Chicago psychology professor L. L. Thurstone to develop an examination for applicants. The examination tested for intelligence, but also for a “schedule of personality traits,” asking “Do you like to hunt? Do you like to wrestle? Do you swear? Are you fidgety? Do you yell at games along with the crowd? Do you have trouble giving orders to servants?” (Katz 1987: 318).

### Horizontal dilemmas

The test was designed in part to decrease the effect of the adverse selection problem by identifying what would otherwise be “hidden” traits — laziness, dishonesty, disloyalty. The organization wanted employees who would work hard and would take the initiative for the good of the company. Tests such as this are quite simply a way of restricting individual preferences in order to reconcile decentralization, efficiency, and transitivity. If people with strong preferences for shirking are not allowed into the organization, problematic preference profiles will presumably not appear. Some work role autonomy can be granted to these individuals without automatically creating a social dilemma.

These certification devices, like the services of the auto mechanic, are expensive; their use represents the efficiency cost of solving the information asymmetry problem. As Spence points out, if education is costly, its use as an effective signal of positive attributes may make both highly motivated and undermotivated applicants worse off. It can make undermotivated employees worse off because they are now exposed as being what they are, but it can make highly motivated employees worse off because in equilibrium the cost of procuring an education is greater than the extra wages they can earn by being differentiated from undermotivated employees (Spence 1974: 20).

Ironically, however, selecting industrious, loyal individuals solves only one level of the Sen paradox. If two different subunits of an organization each select industrious individuals who are loyal to *subunit* goals and values, the Sen paradox can reemerge at a higher level in the organization, as the phenomenon sometimes called “tribal warfare” (Neuhauser 1988).

#### TRIBAL WARFARE

One of the most widespread phenomena in large-scale organizations is known as “tribalism” — conflict among organizational subunits having different sets of goals. Tribalism in organizations generally results in resources being wasted in the pursuit of conflict, lost opportunities due to forgone opportunities for cooperation, or instability as each organization responds in a self-interested way to other subunit actions.

Clearly, these are all manifestations of the Sen paradox writ large. Energetic pursuit of subgoals results in outcomes that are inefficient for the organization as a whole. And unfortunately, the organizational use of techniques of “restriction of individual preferences” does not solve this problem. Because it is the subunits of the organization that control the selection, recruitment, and socialization processes, it is these very processes that allow the subunit goals to be pursued vigorously and “selflessly” by subunit actors. Because the subunit recruitment and socialization are so successful, each subunit can be seen as a self-interested, maximizing rational actor with

### *Managerial dilemmas*

sufficient decentralized authority to bring about inefficiency and/or instability in organizational decision making.

#### *Tribal conflict at Ford*

After the young Henry Ford took over Ford Motor Company from his grandfather, he realized that he needed to hire subordinates with expertise. He managed to hire a good many talented individuals. Within a few years, however, those experts had evolved into warring factions whose energetic pursuit of subunit goals put the firm at risk.

Ford's executive vice-president, Ernie Breech, wanted to pursue a policy of decentralized, semiautonomous divisions, as had existed at General Motors. The first step in implementing this structure was to create a semi-autonomous Ford Division, to which would later be added Lincoln-Mercury and other divisions. The man named to head the Ford Division, which originally constituted almost the entire Ford Motor Company, was Lewis Crusoe, a semiretired General Motors executive who was less a numbers man than a real car man, a man with gasoline in his veins, as they said in Detroit.

Within three months of setting Crusoe up, Breech realized that Crusoe's operational authority was almost as great as his own, and that Crusoe therefore posed a considerable challenge. At a meeting of the Product Planning Committee, with both Ford and Crusoe present, Breech tried to reclaim some of his authority. Crusoe immediately defended his terrain. He told the Planning Committee that he would accept advice but that he intended to "guard the independent thinking of the division as though it was an entirely separate company" (Collier and Horowitz 1987: 240). Since Crusoe by then had impressed Ford, and since Ford had himself been worried about how to control Breech, Crusoe succeeded. In the wake of this decision, Breech worriedly offered the analogy of football, suggesting that he would be coach and that Crusoe would be the quarterback calling his own plays. But Ford, as owner, had effectively created a competition between coach and quarterback in an attempt to retain his own control of the team. Whenever there was a conflict between Crusoe and Breech, Crusoe would appeal over his head to Ford, and generally win.

Breech, worried about the growing power of Crusoe, recruited Robert McNamara, future secretary of defense for the Kennedy administration, as his ally. McNamara was one of a group of "whiz kids" who had used sophisticated management and control techniques to oversee wartime production and been hired by Ford to help fill the expertise gap. Breech and McNamara had a shared interest because McNamara was trying to demonstrate the usefulness of advanced financial and accounting management techniques in the automobile industry, and Breech was looking for some way to contain Crusoe's power.

### *Horizontal dilemmas*

By contrast, Crusoe was the head of a growing group of old-time auto producers who hated the financial analysts like McNamara. They correctly pointed out that McNamara and his sort didn't know anything about cars or their appeal to the mass public. These subgroups tended to recruit entirely different kinds of employees. The production "tribe" under Crusoe contained the old-time engineers, craftsmen, and "car men" who had created the industry, and they tended to recruit engineers with similar orientations. The core belief of this group was that producing a well-made car and advancing the technology were the company's most important jobs.

The financial and accounting staff felt that holding costs down was the secret to making large profits. Therefore cost minimization, rather than technological advancement or automotive excellence, was the core value of this group. Scorned by the old-time production men as simple "bean counters" and "paper pushers," they nevertheless advanced rapidly to a position of strength at Ford under the leadership of Breech and McNamara.

Henry Ford delegated broad authority in the financial control area to Breech and the whiz kids, and he delegated operational control of the production of the postwar line of Fords to Crusoe. The problem was that these delegations of authority conflicted, as in the following case: Crusoe wanted to compete against the sportier and higher-priced lines of General Motors cars with a new car called the Thunderbird. McNamara and the finance people in the central office "said that the new car couldn't make money and tried to kill it by holding back funds for tooling" (Collier and Horowitz 1987: 245).

In this case Crusoe won; in other cases the whiz kids won. The point is that, as predicted by the Sen paradox, there was no guarantee that decisions optimal for the company as a whole would result from delegating financial and operational authority to two quite separate and committed subgroups. The conflict was always a source of instability and, often, inefficiency. Ford did not try to stop the conflict, because he felt that pitting one side against the other increased his own shaky authority.

One disaster produced by the conflict was the Continental Mark II. The original idea behind the Continental was that it would not necessarily make money itself, but that it would facilitate the marketing of the entire line of Ford cars. The Continental was to be such an attractive top-of-the-line car that it would draw people into Ford dealerships, and they might then end up buying a Ford instead of a Chevrolet.

But the Continental became identified with the Crusoe faction at Ford, and it became fair game for the Breech-McNamara faction. Breech made a series of decisions – for instance, refusing, in the name of cost cutting, to allow a four-door version of the car to be made – that made it much less attractive to the high-income families who were the intended buyers. The net result was that just enough money was invested in the Continental to

### *Managerial dilemmas*

make sure that it would be a big loser, but not enough for it to serve the marketing purpose for which it was intended.

For several years, Crusoe's authority grew as he continued to make money for the firm. As his authority grew, he became bolder, and Henry's support for Crusoe against Breech became more enthusiastic (Collier and Horowitz 1987: 247). As a sign of Crusoe's increasing authority, he developed what came to be known as the "Big Plan," a scheme for creating several new divisions at Ford to compete with the more expensive lines of General Motors. Some divisions would create new Mercurys, Lincolns, and Continentals, while another one would create a totally new car. Crusoe was careful to get Ford excited about the plan and to make sure that everyone in the company knew that Ford supported it before it came up for general discussion. Because Ford was known to favor the plan, all of the people who would normally have voiced reservations about it turned into yes men. At the meeting of the Product Planning Committee in 1955, Breech was the only person to raise his hand against it. The result was the Edsel, which turned out to be a financial disaster for Ford. Once again, enthusiastic pursuit of "tribal" goals shattered coherent planning and limited overall efficiency.

### CONCLUSION

The approach taken in this chapter suggests that, as long as hierarchies have more than one subordinate unit in an organization, each capable of determining some aspect of the organization's behavior, they may be subject to the same problems of inefficiency and incoherence that have been more extensively studied in voting, committee, and legislative contexts.

Nondictatorship, efficiency, and transitivity can be reconciled, but only if unrealistic assumptions are made regarding restrictions on individual preferences. As long as individuals value leisure or have their own policy preferences, shirking or "deviationism" will have the potential to produce inefficiencies or instabilities in otherwise homogeneous teams or in simple hierarchies. Multiple specialized subordinates and experts compound the problem by building in additional pluralism of values within the organization and by reinforcing the decentralized decision rules that give subordinate units the ability to determine aspects of the organization's overall behavior. Each of the traditional Weberian elements of bureaucracy—hierarchy, specialization, and expertise—presents a new manifestation of the Sen paradox.

Hierarchy seems to offer no magic solution to the problems that have been studied extensively in legislatures regarding the collective consumption of goods with externalities. In bureaucracies, as in other social choice mechanisms, there must be a trade-off between desirable characteristics. In particular, if we want any degree of decentralization in hierarchies, we

### *Horizontal dilemmas*

cannot guarantee that stable choices will be efficient, or that efficient choices will be stable.

As the structure of the Sen paradox reveals, the only way around this problem is to violate the condition of universal domain. Substantively, this means that, in order to have stable, efficient, delegated decision making, organizations must guarantee that individuals do not present problematic combinations of individual preferences to the organization. In other words, individuals must present "coherent" preferences. Individuals with preferences that will create problematic preference profiles must be eliminated from the organization or convinced to change their preferences.

As a result, organizations use selection and socialization to screen out individuals with problematic preferences. There is no doubt that these techniques allow for a greater degree of coherence and efficiency in organizational decision making than would otherwise be the case. However, there is also little doubt that these techniques are insufficient by themselves to eliminate the problematic preference profiles. For one reason, "adverse selection" problems make it difficult to measure the most important characteristics of potential recruits.

Just as important, however, the selection and socialization processes are for the most part conducted by organizational subunits. As a result, large organizations must still concern themselves with the Sen paradox.

What tools does this leave the central hierarchy of a large, specialized organization? Probably the most fundamental tool is the incentive system. In terms of the Sen paradox, an incentive system may be thought of as a violation of the condition of universal domain for the purpose of reconciling transitivity, efficiency, and delegation. That is, an incentive system is intended to permit delegation without creating disunity or inefficiency. Rather than allowing people to articulate any set of preferences in an organization, an incentive system is used to shape and mold the "natural" preferences of risk-averse or lazy members and to control the centrifugal tendencies of autonomous subunits. The following three chapters will examine the possibilities and limits of incentives as ways of reconciling decentralization, coherence, and efficiency in organizations.