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## Management Control, Expectations, Common Knowledge, and Culture

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**Abstract:** Control in organizations can be defined as expectational equilibrium, or correspondence between how the members of an organization behave and how others expect them to behave. Using a contract model of organizations as the base, we use human expectations, common knowledge, and culture to propose a theory of control. Changes in factor and product market conditions tend to disrupt control in organizations. Strategic management consists of continual monitoring and anticipation of market conditions, and redesign, negotiation, and implementation of contracts to restore and maintain the expectational equilibrium.

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### INTRODUCTION

Control is a key concept in accounting and management. I explore control in organizations as an expectational equilibrium, or correspondence between what agents do and what others expect them to do. Starting with the contract model of organizations, I examine expectations, common knowledge, and culture as the fundamental elements for an expectational theory of control. I conclude with an exploration of the broader problem of maintaining control under continually changing business environments.

#### A Contract View of Organizations

Beginning some 60 years ago, Barnard (1938), Cooper (1951), Cyert and March (1963), Simon (1947), and their colleagues built the modern theory of organizations. One of the key ideas to emerge from the work of this "Carnegie School" is that we can usefully think about an organization as a set of contracts or an alliance among economic agents. The result is a simple, but powerful, synthesis of economic and organizational theories. This model of organizations can sustain a robust theory of accounting and control. Simply stated, if organizations are contract sets or alliances, then accounting is their operating mechanism to make them work. Most accounting concepts and aspects of accounting practice can be integrated into the contract model of the firm (see Sunder 1997).

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By entering into contracts, agents make promises to deliver resources and are promised delivery of resources in return for their performance. Agents enter into these contracts when they believe that what they expect to receive from participation in the organization is worth the sacrifice they expect to make. For an organization to succeed, its production technology and set of contracts must satisfy each one of its participants by delivering enough resources to them. When this crucial condition cannot be fulfilled, dissatisfied agents abandon the alliance; the alliance collapses unless an alternative set of contracts that fulfills this condition can be assembled.

We need to define our terms—economic agents and contracts. An economic agent is a person whose actions are consistent with his preferences. Whenever an opportunity arises, the agents choose their preferred courses of action out of the set of actions available and known to them. If the person chooses a course of action whose consequences are dominated by the consequences of other available actions, the person cannot be thought of as an economic agent. Such a choice is not consistent with the individual's preferences and objectives. It is difficult to model a social science without assuming at least a minimal level of behavioral consistency.

A contract is an understanding, for mutual benefit, among two or more economic agents about one another's actions. A lunch date is a contract. So are hiring a welder, buying a share of stock, and promising a delivery schedule to a customer. In these examples, each party makes a (implicit or explicit) promise to take a specific action with the expectation that such actions, collectively, benefit them all. As I use the term, a promise does not have to be legally enforceable in order to qualify as a contract. But it can be. All promises do not have to be explicitly stated. Many aspects of the promise are left to social convention and mutual understanding. A promise does not have to be written down in order to qualify as a contract.

Contracting individuals have their own purposes or goals. They choose to enter contracts and comply with them. We can assume that they join an organization only when they prefer the expected consequences of such participation (compared to the alternative opportunities for employment of resources they have to offer). Organization is the game in which goal-seeking individuals play by agreed-upon rules.<sup>1</sup>

This view of organizations covers a broad range including business, government, and society.<sup>2</sup> I use the example of business organizations. A business corporation can be thought of as an alliance among those who contribute capital (shareholders, bondholders, banks), labor (employees), management skills (managers), cash (customers), equipment and supplies (vendors), public services (government), and support (community), and so on. In exchange for their contributions, various agents may receive dividends, interest, salaries, wages, benefits, products, cash, tax payments, clean air, and so on. Depending on their purpose, different people look at the contract set at varying levels of detail and specificity.

### **Accounting in Organizations**

Accounting helps define, implement, enforce, modify, and maintain the contract set of organization. Accounting serves these functions through five aspects of practice: measurement of resource inflows and of outflows, determination of contract fulfillment, provision of information to factor markets, and public disclosure.

<sup>1</sup> Whether we choose to view a set of contracts as an organization or as a market is essentially a matter of choice based on the purpose of analysis. New York Stock Exchange is usefully viewed as an organization for certain purposes; research department of Intel can also be viewed as a market in which scientists and engineers sell their skills.

<sup>2</sup> Also see Alchian and Demsetz (1972), and Fama and Jensen (1983a, 1983b).

Contributions from and inducements to participants take many forms. Accounting defines and measures the contributions made by each agent. In business organizations contributions of goods and supplies are reckoned and recorded into the accounting system at the receiving dock. Money from the customers is handled through the cashier, accounts receivable, and customer accounts. Contributions of labor might be measured at the punch clock, quality inspection, or the transfer of goods from the factory to the finished goods warehouse.

In its second function, accounting defines measures, records, and controls the outflow of resources from the organization.<sup>3</sup> Payroll and benefit accounts for employees, shipping for customers, accounts payable for suppliers, and tax accounts for the government—all measure the outflow of resources to various agents.

In its third function, accounting compares the data on resource inflows and outflows with the contract set to determine who has fulfilled his contract and to what degree. Comparative reports on resource inflows and outflows are prepared for various individuals in the organization to help evaluate their performance and adjust their contracts for the subsequent periods.

In a fourth function, accounting helps maintain liquidity in the firm's factor markets for labor, goods, and capital. When a worker, customer, investor, or other participant leaves, firms often need to find a replacement by convincing others in the appropriate factor market that participating in such an enterprise is in their own best interests. Entrepreneurs often prepare *pro forma* financial statements, business plans, and budgets, even before the enterprise starts functioning, to convince agents that the benefits of participating in the proposed enterprise in various roles are worth the sacrifices expected of them. Budgets and plans are also a routine and essential aspect of control in existing organizations at all levels of managerial hierarchy.

Finally, when the contract terms expire, they are renegotiated under the prevailing circumstances. Some agents are tempted to issue threats to quit their position in the organization unless the terms of their contracts are revised in their favor. Such threats and bluffs sometimes lead to deadlocked negotiations or strikes, causing deadweight losses to society. Accounting performs its fifth function by sharing at least a minimal set of information among the negotiating parties to make it common knowledge, thereby helping to reduce the chances of breakdown. Public disclosure in larger organizations is an instrument for creating such common knowledge.

To summarize, we can think of each organization as a set of contracts or alliances among many people who join it with the expectation of gain. We can think about accounting as the mechanism to define, implement, enforce, modify, and maintain this system of contracts. This general perspective on accounting and control sets the stage for examining their differentiation. Organizations differ at their inception according to the goals and resources of the entrepreneur who designs them. Later they evolve under the interests, resources, and actions of their participants, changing market conditions, as well as random events. Accounting systems adapt to changes in organizational design. Let us characterize organizations and their respective accounting systems by conditions prevailing in their factor markets.<sup>4</sup>

<sup>3</sup> Resource flows are defined relative to a given unit of organization. Resources that flow into and out of smaller units of organization do not necessarily flow into and out of an aggregation of such units.

<sup>4</sup> Alternative perspectives on accounting include Demski and Feltham's (1976) distinction between the decision-influencing and decision-facilitation roles of accounting, and Zimmerman's (2001) distinction between decision making and control. Under the perspective used here, decision making and control stand in an inseparable dual relationship (see Demski et al. 2002, Section 3).

## A Taxonomy of Organizations and Their Accounting

Organizations and their accounting systems can be classified by the extent of development of the markets in which they operate (see Sunder 1999, 2000). Just as different buildings need different electrical systems, different kinds of organizations need different kinds of accounting and control. In our taxonomy, we classify organizations on the basis of markets for managers and capital, as suggested by Hatfield ([1924] 1962), and markets for their products.

### Classification by Market for Managers

Without a market for managers, owners of a business manage it themselves. When it is possible for proprietors to hire professional managers, a market for managerial services exists.

The classical double-entry bookkeeping model of accounting serves the needs of proprietorships. Early accounting was developed by traders who often entered into repeated credit transactions with many people, and by the king's tax collectors. Accounting is differentiated from mere counting by establishing the cause-and-effect relationship between the sacrifice and benefit aspects of each transaction (see Ijiri 1975). This cause-and-effect-driven organization of transactions gave double-entry bookkeeping its balance and usefulness as a powerful instrument of control in organizations. Bookkeeping is designed to implement the contract set of simple organizations. Most firms belong to this class.

As markets develop for managerial labor, organizations can expand to include two or more levels of management. Their accounting must be adjusted to a stewardship form to establish a balance among the divergent interests of the additional decision-making participants. In ancient times, stewardship accounting developed to handle the accounts of temples and sovereigns, as well as merchants or landed gentry who employed stewards to handle their estates.<sup>5</sup> Organizations involve actions, thoughts, information, and motives of more than one person. Stewardship accounting manages their conflicts.

At the turn of the twenty-first century, the bulk of what we teach under the label of managerial controls consists of stewardship issues arising from the existence of the managerial labor market. Planning and budgeting, divisional and managerial performance evaluation and compensation, decentralization, transfer pricing, capital budgeting, and various forms of variable and absorption costing including activity-based costing, are all concerned with the problem of control in organizations with managerial hierarchy. Stewardship or managerial accounting includes bookkeeping as its foundation. But the accounting needs of hierarchical organizations include the above-mentioned additional features absent in Paciolo's description of the accounting practices prevailing in fifteenth-century Europe (see Geijsbeek 1914).

<sup>5</sup> "An elaborate system of checks and balances was maintained in Rome for governmental receipts and disbursements by the *quaestors*, who managed the treasury, paid the army, and supervised governmental books. Public accounts were regularly examined by an audit staff, and *quaestors* were required to account to their successors and the Roman senate upon leaving office.

The transition from republic to empire was at least in part to control Roman fiscal operations and to raise more revenues for the ongoing wars of conquest. While the facade of republicanism was maintained, the empire concentrated real fiscal and political power in the emperor. Julius Caesar personally supervised the Roman treasury, and Augustus completely overhauled treasury operations during his reign.

Among Roman accounting innovations was the use of an annual budget, which attempted to coordinate the Empire's diverse financial enterprises, limited expenditures to the amount of estimated revenues and levied taxes in a manner which considered its citizens' ability to pay." Available at Web site of the Association of Chartered Accountants of U.S.: [http://www.acaus.org/history/hs\\_anc.html](http://www.acaus.org/history/hs_anc.html).

With the development of labor markets, especially managerial labor markets, hierarchical organizations became an efficient form and stewardship accounting evolved to serve them.<sup>6</sup> The introduction of scientific management by Taylor (1911) reflected development in the managerial labor market. Professional engineers and managers, who did not have the skills of the people they supervised, took over the control of the shop floor from the senior skilled artisans. With their education and planning skills these professionals overwhelmed the ability of the workers to control their environment. The latter resisted without success. Over the past century, the development of this aspect of accounting in the United States has closely paralleled the development of the managerial labor market. College programs in commerce and business have grown to serve the market. The University of Pennsylvania opened the first collegiate business program<sup>7</sup> even as Taylor, a hometown boy, reshaped the future of manufacturing and management in neighboring Bethlehem.

### **Classification by Market for Capital**

At one end of the scale, there is no market for capital, and the single owner, or his family and personal friends, must provide the capital. They can directly manage the firm, and give effective direction and supervision to hired managers. The number of individual sources of capital an organization can economically draw from multiplies as the capital markets develop to become more liquid. As the number of owners increases, it becomes increasingly difficult for them to manage the firm directly, or to give effective direction to hired managers. Such firms developed the financial-reporting model of accounting to solve this problem.

Publicly held corporations lie at the other end of the scale of diffusion of sources of capital, and they place additional demands on accounting. Investors who are far-removed from the operations of the firm need to safeguard their capital and to enforce the contract set. To protect themselves against nonperformance or malfeasance by managers they do not know, investors of these corporations resort to rules and standards of financial reporting. Rules and standards limit the exercise of discretionary judgment by managers, and therefore the informativeness of the reports, even as the rule makers strive to improve the value of financial reports. Fearing self-serving manipulation by managers, financial-reporting rule makers try to narrow the band of managerial discretion. However, eliminating discretionary reporting is a double-edged sword; even self-serving reports by managers in a discretionary regime can reveal information about the manager's type (Levine 1996).

In active capital markets, investors search for information about the prospects of the firm. Financial reports remain an important source of information. Competition among sources attenuates the investor's reliance on financial reports.

In low-transaction-cost capital markets, stock prices can respond to information about the firm within minutes or hours. In the early years of development of the financial-reporting model, corporate managers used secret reserves to smooth out the financial reports over time to minimize share price movements in response to transient events. As capital markets develop, such practices become increasingly unacceptable to professionalized investors who prefer unvarnished performance data as inputs to their valuation models.

<sup>6</sup> See Polanyi (1944) for development of labor markets in Europe, Simon (1996, Ch. 8) for efficiency of hierarchy and Yamey (1962) for development of stewardship accounting in England.

<sup>7</sup> See Sass (1983) for a history of the first collegiate business program in the United States.

A third consequence of the financial-reporting model is the shift of emphasis from stock variables to flow variables (balance sheet to income and cash flow statements). Markets for fixed assets of industrial corporations tend to be imperfect; historical book values of such assets are poor indicators of their future earning power. Projection of current earnings and cash flows into the future for the purpose of security valuation is subjective. Investors' and analysts' need for a sustainable earnings figure that can be projected into the future gives rise to lengthy debates and detailed rules on isolation of nonrecurring elements of income from recurring elements. The recent practice in some public corporations of excluding restructuring charges and some other elements from the so-called "*pro forma*" earnings is a consequence of this debate. On the other hand, risk analysis and management have generated a counter, albeit weaker, trend toward attention to balance sheet variables.

With the help of market-based research, accountants today are more aware of the existence of alternative sources of information for the stock market, the complex interaction among these sources, and the behavior of stock markets. Mechanical interpretation of accounting reports can mislead investors; the existence of the market limits the extent of such misinterpretation, but does not eliminate it.

Development of markets for securities as well as for goods and services has led some to argue, especially during periods of significant price movements, that the historical cost valuation should be replaced by market valuation of assets and liabilities. As all markets are imperfect in varying degrees, errors of measurement in market-based prices must be weighed against the errors of ignoring inflation (Lim and Sunder 1990, 1991; Sunder 2002b). Second, the benefits of inflation accounting for security valuation must be weighed against any reduction in the effectiveness of the financial-reporting system for implementing and enforcing the firm's contract set. While several proposals for market valuation have been explored in the United States, none have survived in practice.

The vast majority of firms in the United States and elsewhere are proprietorships, partnerships, or privately held corporations. Ownership rights to such firms are not traded in liquid markets. They do not need and do not use the financial-reporting model of accounting in its fully developed form that publicly held corporations use. We turn next to the effect of the conditions prevailing in the product markets on accounting and control of organizations.

### **Classification by Markets for Products**

Accounting and control for organizations that produce private goods, such as cars or furniture, are different from accounting and control for organizations that produce public goods, such as public safety or clean air. Organizations that produce private goods have customers who can withhold revenue from the firm if they are not satisfied with the goods or services they receive. Shareholders of such organizations can delegate most production decisions to hired managers, and motivate them by promising compensation based on the net income (the residual revenue after paying for all factors of production other than equity capital) they generate for the shareholders. Such a system is possible because the customers of such organizations can look after their own interests.

On the other hand, organizations that produce public goods have beneficiaries, not customers. Beneficiaries do not have the power to withhold revenue, and cannot impose the kind of direct discipline on the managers that the customers can impose. Evaluation of managers of such organizations by net income would simply induce them to engage in dysfunctional behavior, resulting in collapse of

the organization. Bureaucratic management, characterized by fixed compensation, impersonal rules, tenure in job, and promotion from inside (see Weber 1947), is a solution to this difficult managerial problem. Such organizations use bureaucratic management. This fundamental difference leads to very different organizational structures and accounting and control systems between organizations producing private and public goods.

The differences include the absence of a market for ownership rights or shares, investment and product decisions at the board level (no delegation to hired managers), fixed compensation, detailed line-item budgets, and appropriations without managerial discretion to transfer funds across authorized categories, and absence of consolidation, accrual, and depreciation (see Sunder 1998).

More generally, the design of an organization and its accounting and control system depends on the amount of market power the organization has in its product market. The more limited the market power, the more likely the organization can use the techniques of private good organizations. As the market power of the firm increases and the customers' ability to discipline the managers wanes, alternative designs become necessary to install adequate control on management to ensure the efficiency of operations. Accounting for private and public good organizations lie at two ends of the spectrum.

This taxonomy of organizations by the extent of the development of their labor, capital, and product markets establishes a parallel taxonomy for their control systems. Bookkeeping is the elemental accounting form for simple, nonhierarchical organizations managed directly by their owners. Addition of hired managers to organizations necessitates stewardship elements to supplement simple bookkeeping. When ownership of the firm becomes sufficiently diffuse, the financial-reporting form of accounting becomes necessary to establish control. In the following three sections we examine expectations, common knowledge, and culture as the building blocks of control in all its forms.

### **Expectations**

To expect is to think about and anticipate the future. Our expectations are tinged with hope, leaning toward the future we prefer. In addition to this social psychological concept, expectation has a statistical meaning—the first moment or mean of an objective or subjective probability distribution. Objective distributions are rooted either in the partition of event space or in observed frequencies. Subjective probabilities are simply beliefs about chances of various events being realized. The mathematical first moment of this subjective distribution is the second psychological meaning of expectation. Two of these three interpretations of expectations are person-specific, and we should not expect these three meanings to coincide, except by chance. In management, we deal with all three in different contexts.

Defining most expectations as means of objective probability distributions is not possible. It is often a stretch even to define them as means of subjective probability distributions, leaving us to work with social psychological constructs. Managing organizations on the basis of such constructs, or modeling management processes, presents several challenges.

Human expectation formation is complex and not well understood. For example, people are far more aware of the risk of flying in an aircraft than the risk of driving a car, in spite of the statistical evidence documenting the relative safety of air travel. Social psychological constructs do not necessarily correspond to frequency statistics gathered in the field.

Organizational contracts themselves are defined as expectations of resource flows. A customer who buys a General Motors car has expectations about its

performance and durability that extend well beyond the formal warranties offered by the manufacturer. An engineer who accepts a job with Microsoft has expectations about work, compensation, learning, and advancement that extend beyond the explicit promises made by the recruiters. An investor who buys shares of CitiGroup may have expectations about returns that go beyond management's promises. Lin and Sunder (2002) analyze data from ultimatum bargaining games to examine how an agent's actions shape others' expectations, and how the latter adjust their behavior to revised expectations.

Agents manage what others expect from them. They must create appropriate expectations, and meet them. If the expectations are too great, an implicit or explicit contract will be breached, and others will turn away in disappointment. The same is also true of organizations. If agents expect more than the firm delivers, their disappointment may induce them to depart. If agents get more than what they expect, resource constraints will leave other agents disappointed with what remains for them to claim. In either case, failure to deliver on expectations, and managing expectations at realistic levels, threatens the ability of the firm to continue (see Sunder 2001b).

Budgeting, performance evaluation, and compensation are important aspects of management that are closely related to agents' expectations and to one another. Budgets, performance measures, and compensation functions help set the agents' expectations and are, in turn, influenced by their expectations. A loose budget or generous compensation may make an agent happy and motivated, but may also set up an expectation of similar generosity to follow. Early gains from such actions may easily be reversed through subsequent disappointments. On the other hand, cost savings that are seen as unjust or unfair in their burden on individuals or organizational units may create similar expectations of unfairness in the future, generating defensive reactions that eliminate the early cost savings. In either case, a significant part of management consists of managing current actions in light of the expectations about the future and other consequences they generate.

Instead of choosing a target and sticking to it, managers are often urged to maximize various combinations of product quality, customer satisfaction, sales growth, earnings per share, or stock price, etc. They are asked to add shareholder value beyond what is already anticipated and therefore discounted. In a market context, this becomes a game of trying to outrun one's own shadow. Pursuit of shareholder value, when the current value incorporates unbiased expectations of future managerial actions, ends in failure through managerial exhaustion, fraud, or both.

According to one calculation, to justify its peak valuation of \$68 billion in August 2001, Enron would have had to grow its free cash flow at the rate of 91 percent per year for six years, followed by the average rate of growth for the economy (see Fuller and Jensen 2001). Instead of publicly disowning such expectations, Enron apparently set out to fulfill them through means fair or foul.

The growth culture of modern corporation does not sit well with the malleability of human expectations. Assigning rewards to unexpectedly good performance induces either downward manipulation of expectations or upward manipulation of performance measures. Since everyone cannot perform above average, management and control face the challenge of creating expectations and contracts that are sustainable in steady state.

### **Common Knowledge**

Common knowledge has come to be used as a technical term in philosophy, statistics, game theory, and economics to include knowledge about what others know. Simply put, a piece of information is common knowledge between agents A



and B if both A and B have the information (first-order knowledge), and both A and B know that the other has the information (second-order knowledge), and both A and B know that the other knows that the other has the information (third-order knowledge), and so on, *ad infinitum* (see Aumann 1976; Sunder 1997, 2002a).

To illustrate its importance for control, consider two examples. In Hans Christian Andersen's fable "The Emperor's New Clothes," two scoundrels convinced a vain emperor that they could make a special gorgeous-looking cloth of silk and gold threads invisible only to the incompetent and the stupid. The emperor gave them money and materials to make the royal garments, and they dressed him in nothing at all. No one at the court, the emperor included, dared admit not seeing any clothes for the fear of being branded stupid and incompetent. The public showered applause and praise as the emperor went in a parade to show off his new "clothes" to the public. Then a child cried: "The emperor has no clothes!" After a moment of stunned silence, so did everyone else. Why did the child change the people's minds?

A second story concerns accounting for inventories. U.S. tax law permits business firms to use the LIFO method of inventory valuation for tax purposes provided that they use the same method for preparing their public financial reports. During inflation, this method can save cash by delaying tax payments to the government (Sunder 1976a, 1976b). In spite of significantly positive rates of inflation for more than 40 years after World War II, many firms in industries with significant inventory inflation did not adopt LIFO. When surveyed about the reasons for their reluctance to adopt LIFO, corporate financial officers express their apprehension that the adoption of LIFO, and the consequent fall in earnings, may cause a drop in stock prices. Yet, empirical studies fail to reveal any such drop. On the contrary, most empirical studies show that the stock prices of firms who adopt LIFO rise (Sunder 1973, 1975). How do we reconcile these facts?

In both these stories what we believe about others and about their beliefs plays a crucial role. Because the people had been led to believe that the emperor's clothes would be invisible only to the stupid and the incompetent, they could hide their supposed stupidity and incompetence by pretending to see the clothes and joining in the general applause.

However, it is also possible that the cheering masses included some who did not believe that they were stupid and incompetent because they could not see any clothes on the emperor's body. Even such people would have known that if they said that the emperor had no clothes, others around them would falsely regard them as stupid and incompetent. They thought it wise to keep their doubts to themselves.

The child was too young to understand the maintained hypothesis, and said what he saw. People know that children are innocent. If the innocent observation matched the observation of the adult, it raised doubts about the maintained hypothesis in the minds of the adults, too. Each such doubt reinforced the doubt in others. Children's innocence, people's belief in children's innocence, and people's belief in the other people's belief in his innocence all played a role in the revelation of the truth about the emperor's clothes.

In the LIFO method of inventory valuation, business organizations must solve the agency problem of inducing managers to take actions that will maximize shareholder value. Linking managerial compensation to shareholder value is one approach to making the managers' and shareholders' goals mutually congruent. Fearing that the shareholder value reported by the manager is subject to self-interested manipulation, we replace accounting by stock market values. In an efficient stock market, this solution to the agency problem should work well.

Consider a manager who is compensated on the basis of shareholder value as measured by the net present value of future cash flows. What should this manager do if he knows that the adoption of LIFO accounting will save cash for the firm but will lower its reported income? A compensation-seeking manager should adopt LIFO if doing so increases the net present value of cash flows. But the shareholders, recognizing the difficulty of observing either the managers' actions or future cash flows, link the managers' compensation to stock prices. Observable current stock prices serve as a proxy for unobservable future cash flows in the compensation function. Such a manager must consider not only the direct effect of his actions on the cash flows of the firm (i.e., on the fundamental value of the firm), but also on the stock prices. If the stock prices are equal to the fundamental value, we should still expect the manager to adopt LIFO.

What if the manager believes that some or all investors use accounting income in valuing the stock. In such a case, a manager may well decide that his own interests will be best served (stock prices will be maximized) by not adopting the income-reducing LIFO accounting method. Amershi and Sunder (1987) introduced the consequences of dropping the common knowledge assumption in accounting. They show that if we allow for the possibility that the managers' beliefs about how shareholders value shares are in error, an efficient stock market will fail to discipline managers for making bad decisions. Managers may rationally fail to adopt LIFO knowing fully well that LIFO saves cash and is in the best interests of the shareholders. Their beliefs about how investors act is a crucial part of this apparent paradox.

Common knowledge is a foundational element in control. As these two examples illustrate, relaxation of common knowledge has important consequences when agents' behavior depends on their expectations of one another, alternatively defined as their culture.

### Culture

In management, culture is often treated as a counterpoint to economics.<sup>8</sup> Accordingly, it appears only sporadically in the analyses of management controls in our literature (see Chow et al. [1999] for an overview). Instead, we can think of the culture of a group as the common knowledge expectation of behavior of its members. For example, if the members of a firm expect its meetings to start on time, timely meetings are a part of its culture. If the members of a firm expect budgets and production targets to be met, achieving such goals is the culture of the firm. Common knowledge expectation is both a necessary as well as a sufficient condition for any component of culture. If wearing black-on-black is a common knowledge expectation among students of a college, it is also their culture; if it is not a common knowledge expectation, it is not part of their culture. The same is true of meeting budgets, cost targets, and production schedules.

<sup>8</sup> "(Culture is) the social artistic and scientific heritage of a community or society. (Culture includes) the intergenerational communication of information, other than genetic information, in the form of material artifacts (e.g., tools, weapons, buildings, works of art), distinctive forms of behavior (e.g., songs, rituals, institutions, organizational forms), and systems of distinctions (classifications, histories, knowledge coded in symbols, ideas or beliefs). Culture incorporates individual and collective responses to environmental conditions and its content is continually subjected to evolutionary processes such as random mutation, recombination, and selection." *Web Dictionary of Cybernetics and Systems*. Available at: <http://pespmc1.vub.ac.be/ASC/indexASC.html>. See Kreps (1990) for an economic treatment of culture based on reputation effects and Little (1991) for an examination of the rational choice approach in this field.

Expectations about the behavior of others lie at the heart of economic models. A concept of culture based on such expectations fits well within the context of economic models. Assuming that this concept incorporates the important aspects of culture as they relate to management and controls, one can build a useful model of control in which the role of culture is to help guide the formation and adaptation of expectations.

### **Management Controls**

A theory of control in organizations can be built on the foundation of four concepts—organization as a set of contracts, expectations, common knowledge, and culture. An organization or group is *in control* when its members find it in their own best interest to behave in a manner that is expected of them by the other members of the group. Culture shapes expectations; behavior of agents in an organization in control corresponds to, and reinforces, the culture of the group.

The idea of control *in* organizations is distinct from control *of* organizations. The former connotes balance and equilibrium among interests of agents; the latter suggests manipulation, even exploitation, of some agents by others. Control *of* organizations implies that the organization is an instrument of an agent or a group who uses it to attain its objectives, emphasizing the disparity in the relative bargaining powers of the controlling agent and the others. Under the concept of control in organizations, we look at organizations more symmetrically, from the point of view of various participants. In a modern corporation even the chief executive officer does not control the rest of the organization because the CEO also is subject to control in the firm, just as all other agents are. We focus our attention on the larger and more general problem of control *in* organizations.

A comprehensive perspective on control includes rules, incentives, monitoring, and enforcement combined to induce all participants in an organization to behave in a manner consistent with what other participants expect of them (see Sunder 1997). Control is the equilibrium between actual behavior and mutual expectations of participants in an organization. For example, when two people trade on eBay, the seller expects to be paid, and the buyer expects to have the appropriate goods delivered (see Duh et al. 2001). When each of them performs what the other expects, the system is in equilibrium, or in control. This concept of control extends beyond managers and employees to shareholders, customers, suppliers, and other agents. A receiving department, for example, monitors transactions between suppliers and the firm, while accounts receivable and credit authorization procedures monitor interactions with customers. For a business to function smoothly, activities of all its participants must be in control in this broader sense. Participating agents are selected through their willingness to accept the firm's contract set. Employees, for example, may have been screened through tests, and suppliers may have to conform to product and process quality standards (e.g., ISO certifications) chosen by a firm. These agents may also receive guidance or training in the company practices and policies. After evaluating the risk and prospects of their investment in the firm, people decide if they wish to be its shareholders.

The traditional focus of control has been the internal processes of organizations involving people who frequently have social relationships. Even buying a book across the counter or checking out groceries creates nontrivial social interactions between customers and employees. Increasingly, e-commerce often strips transactions from their traditional social context. The scope of e-commerce is limited only by accessibility to the Internet and a shared system of remote deliveries and payments, which extend well beyond the traditional boundaries for most transactions.

Shared norms of social exchange play an important part in transactions. e-Commerce transactions can be global, allowing participants who may not share a common set of cultural or ethical norms to reach one another through electronic platforms such as eBay. This incompatibility has two simultaneous but opposite consequences. On one hand, shared e-commerce platforms may speed up the development of a homogenized set of global norms for commercial transactions and culture. Software can be designed to introduce elements of social setting. On the other hand, as the cost of creating electronic platforms shrinks, special purpose platforms catering to preexisting social, linguistic, national, or technological groups proliferate. Some e-commerce platforms combine traditional and electronic elements of transactions to achieve control through a hybrid medium of exchange.

All three tendencies can be seen in operation at eBay. On one hand, e-commerce is developing its own homogenized culture across many traditional boundaries, illustrated well by a *New Yorker* drawing of two dogs on a personal computer, "On the Internet, nobody knows you are a dog." These trading platforms are new, and they engender new expectations and behavior among the participants, giving rise to a new Internet culture. On the other hand, eBay, Yahoo, and other auction operators created distinct trading platforms in various countries when the gulf between social, cultural, commercial, and linguistic expectations proved too daunting to bridge through a single electronic platform. Third, combining its electronic and traditional features, eBay gives its customers phone numbers (and email addresses) of the counter-parties so customers can talk to a real human being before closing a transaction. Not constrained by a fixed menu, phone conversation allows customers to transmit a great deal more information that they consider to be important in a synchronous mode through free form messages. Even the electronic wizardry of web platforms confines users to fixed menus and asynchronous communication, and fails to achieve the aural "eye contact" that a phone conversation provides.

Control—expectational equilibrium between what participants do and what others expect of them—is essential to sustain organizations. The opacity of Internet transactions limits common knowledge, making control more difficult to attain in e-commerce. Traditional approaches to accounting control focus on "internal" participants. e-Commerce business systems often bring a large number of "external" participants into direct contact with one another. For example, the online auctioneers must reckon with the possibility that their customers could cheat others on the trading platform, gather unauthorized data about them, or use the data for unrelated purposes. Establishing expectational control among all participants is a prerequisite to success, especially in e-commerce.

Duh et al. (2001) propose a simple two-dimensional framework for examining the control mechanisms of online businesses. Each aspect of an online auction, for example, is examined by three criteria (privacy, security, and integrity) from the point of view of four classes of participants (customers, sellers, employees, and operators). This framework can be used (1) by firms to identify, compare, and fix the weaknesses in their own systems; (2) by assurance service industries to map and develop the market for their products; (3) by regulators to develop and enforce policy on trade, privacy, and governance; and (4) by researchers to identify important open questions.

### Threats to Control

Environmental changes continually threaten to disrupt control in an organization. Supply and demand conditions in markets for labor, capital, and products may shift for a myriad reasons. Agents may no longer find the behavior expected of

them under the prevailing contracts to be in their own best interests. This lack of correspondence threatens the control and stability of the organization. Without prompt attention to realignment, an organization may collapse through defections, lack of coordination, and bankruptcy (see Sunder 2001a).

Continual environmental monitoring for existing and potential threats to control is a critical managerial function, especially at the higher levels. Although they may occasionally be able to neutralize the change in the environment, managers typically must redesign the contract set to restore control under the changed circumstances. They must also identify which agents will be needed in the revised set, renegotiate the contracts with them as necessary, and negotiate the exit of those who will no longer participate. The revised contract set may also require new agents who must be attracted to the firm from the appropriate labor, capital, and product markets. These functions of senior managers are variously labeled as long-term planning or strategic management.

### CONCLUDING REMARKS

Control is a core concept in management. Understanding control and its key role in management requires an appropriate model of organizations built on robust foundations. Such a theory will promote improved accounting and control, and will give control its appropriate place in the intellectual structure of the management discipline.

The concept of organizations as a set of contracts or alliances among economic agents is a rich foundation for building a theory of control. Agents contribute resources in exchange for inducements, seeking their own goals in the process. Accounting systems help define, implement, enforce, and modify contracts.

The design of organizations, and therefore the design of accounting and control, depends on the conditions prevailing in the markets in which the organization acquires and sells resources. The development of markets for managerial labor led to differentiation of the stewardship model of organizations and accounting from proprietorship and bookkeeping. The development of markets for financial capital has led to differentiation of publicly held corporations and financial-reporting model of accounting from simple bookkeeping and stewardship accounting for privately held firms. The development of markets for products led to differentiation of residual interest corporations and private good accounting (that motivate their managers using performance-based rewards) from bureaucratic forms of management and governmental and not-for-profit accounting.

Contracts are based largely on human expectations, a process not yet well understood. Nor do we understand well the structure of the first and higher orders of knowledge. For simplicity, we routinely assume that we have common knowledge—a term that encompasses the first order as well as the higher orders of knowledge. However, simple examples illustrate the limitations of assuming common knowledge. People do not always believe that others know what they themselves know, with serious consequences for their behavior and the outcomes of organizations and markets.

We can think about the culture of a group as the expectations its members hold about the behavior of other members. Consequently, an organization can be said to be in control if its members find it in their own best interest to act in ways expected of them by the other members of the organization. In other words, control is a state of expectational equilibrium in organizations.

The environment of an organization—the conditions prevailing in its factor and product markets—change continually. These changes threaten to disrupt control. Strategic management (or whatever we choose to call the function of the

top management) consists of preserving control by: (1) monitoring the environment, (2) anticipating changes, (3) modifying contracts, (4) renegotiating contracts, and (5) implementing the revised contracts in the new environment. Given its dependence on the organization's outer environment, maintaining control requires continual foresight, vigilance, and creativity in revising corporate plans.

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