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Cooperative Organizational Strategies: A Neo-Institutional Digest

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This paper describes the neo-institutional approaches of transaction cost economics, agency theory, and property rights analysis and summarizes efforts by economists to apply these concepts to cooperatives. Several problems intrinsic to the cooperative organizational form and its property rights structure are reviewed. These problems have been hypothesized to affect the comparative economic efficiency of cooperative firms and have led to the development of life cycle models seeking to explain the formation, growth, and eventual decline of cooperatives as markets evolve. In this context, statistical analyses of the comparative efficiency of cooperatives and ex post studies of cooperative conversions are surveyed.

During the past quarter century, cooperatives in this country, as well as worldwide, have undertaken substantial structural changes in an effort to adjust to a rapidly changing economic environment characterized by increasing globalization and agricultural industrialization. In addition to horizontal and vertical restructuring in the form of mergers, consolidations, and acquisitions, cooperatives have become increasingly involved in fundamental institutional changes by which some have converted to investor-owned stock corporations. Others have formed hybrid organizations that have taken on some of the characteristics of corporations while seeking to maintain a cooperative character. Alternatively, many have sought external sources of equity capital by forming publicly held subsidiaries or by entering into joint ventures with corporations.

The increasing frequency with which this institutional reorganization has taken place has led to the perception that there may be fundamental features intrinsic to the cooperative organizational form that restrict cooperatives from being able to compete effectively in an increasingly complex economy and that ultimately threaten their long-term survival. Concurrent with the restructuring of cooperatives, and the economy at large, economists have been developing new methods for analyzing organizational forms and their relationships within the market system. Three distinct but related methods that have been developed are transaction cost economics, agency theory, and property rights analysis. Collectively, these three areas of economics have been referred to by some economists as "neo-institutional economics" because they focus on institutions and institutional constraints rather than the profit-maximizing behavior of abstract firms in

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the neoclassical economic paradigm. Appropriately, much of the recent analysis of the cooperative organizational form has been based on these tools.

This paper describes the neo-institutional approaches of transaction cost economics, agency theory, and property rights analysis and summarizes some of the recent efforts of economists to apply neo-institutional concepts to analysis of the cooperative organizational form. There is little in this paper that is original. Its intended contribution is the integration of material from many sources and the evaluation of the usefulness of neo-institutional paradigms for analyzing cooperatives. The paper concludes that neo-institutional methods are extremely useful for studying the organizational strategies of cooperatives, that those analyses that have applied these approaches to the cooperative organizational form have provided valuable insights, but that much work still needs to be conducted.

Neo-Institutional Paradigms[1]

According to the neoclassical theory of the firm, each firm maximizes its profits given its cost structure and the demand for its products. Hypotheses concerning the behavior of the firm are generated by identifying the variables in the firm's profit function and analyzing how changes in the firm's constraints affect its set of opportunities. The assumptions of the neoclassical theory include transaction costs are zero (i.e., the costs of obtaining information about alternatives and the costs of negotiating, monitoring, and enforcing contracts are zero), adjustment costs are zero, all resources are fully allocated and privately held, and owners allocate resources among uses purely in response to pecuniary incentives.

Dissatisfaction with the neoclassical theory of the firm began with the assertion that firms maximize profits and therefore operate at least cost. In the late 1950s, economists began constructing alternative models of the firm based on other assumptions, including maximization of the rate of growth, sales, and firm size subject to some sort of a profit constraint. A second approach to correcting the deficiencies of the neoclassical theory rejected maximizing behavior altogether and focused on the process of decision making within the firm. Key concepts in this approach included satisficing, multiple goals, organizational slack, and other behavioral characteristics of the firm. Although these approaches did not provide a unified framework for replacing the neoclassical theory, they helped to identify some of the limitations of the theory and to stimulate its revision.

A third approach has sought to generalize the neoclassical model by eliminating some of the conditions of the model that do not always hold and that can be expected to yield unrealistic implications. Under this approach, economists have taken nonpecuniary sources of utility into consideration, have explored the consequences of alternative property rights structures, and have examined the implications of positive transaction and information costs, creating opportunities for a major revision of neoclassical theory. Important steps in generalizing the neoclassical model include: (1) eliminating the dichotomy between consumer theory and the theory of the firm by extending the concept of utility maximization to all individual choices, including those made by business managers and government employees; (2) broadening the limits on individual choices to include institutional constraints such as the system of property rights; and (3) incorporating transaction and adjustment costs.

The existence of positive transaction costs introduces new efficiency solutions and suggests that some property rights may not be fully assigned, fully enforced, or priced. In addition, because different systems of property rights present decision makers with

different incentive structures, consideration of alternatives to private ownership of resources implies different behavior in terms of input use and production.

These generalizations of the neoclassical assumptions about transaction costs and property rights have provided economists new insights into the existence of firms, the evolution of alternative forms of business organization, and the choice of organizational form. Within this framework, organizational forms are viewed as developing as a means for minimizing both the costs of production and exchange. In turn, transaction cost economics, agency theory, and property rights analysis have been developed by economists to analyze various aspects of firm organization. Although they analyze firm organization from different perspectives and are sometimes based on different assumptions, they are similar in that they focus on institutional arrangements and constraints.

Transaction cost economics, agency theory, and property rights analysis have been collectively referred to as "a new institutional" or "neo-institutional" economics by some writers (Vitaliano 1983, Cook 1995, and Nilsson and van Dijk 1997). As Nilsson and van Dijk observe, transaction cost economics and other neo-institutional approaches provide heuristic models for guiding thought rather than providing theories, in the strict sense, from which hypotheses can be deducted for econometric testing. In the following sections, each of these neo-institutional approaches to the theory of the firm—transaction cost economics, agency theory, and property rights analysis—are described and some of their important concepts and hypotheses are summarized. In later sections, many of these concepts are applied to analyzing the organizational problems of cooperatives and assessing the potential for cooperatives to compete and survive.

Transaction Cost Economics

Transaction costs are the costs of organizing and transacting exchanges. They include the costs of negotiating and enforcing contracts, and they arise when the possibility exists for one or more parties in a transaction to behave opportunistically, i.e., to seek private gain at the expense of the common good. Transaction costs include both the costs associated with the adverse consequences of opportunistic behavior and the costs of trying to prevent it.

The concept of transaction costs was first described in Coase's (1937) classic paper on "The Nature of the Firm." Other important contributions to transaction cost economics include works by Williamson (1975, 1985) and Klein, Crawford, and Alchian (1978). Coase sought to explain why so much economic activity occurs within formal organizations, or firms, if, as economists so commonly argue, markets are such powerful and effective mechanisms for allocating scarce resources. Coase's explanation was cast in terms of the inefficiencies of transacting in a world of imperfect information. Essentially, when the transactions costs of market exchange are high, it may be less costly to coordinate production within a firm instead of a market.

Contracts play an important role in transaction cost analysis because the existence of a contract enables the parties involved in an exchange to fulfill their obligations sequentially by protecting them from opportunistic behavior, thereby lowering the costs of the transaction. However, not all contracts are equally effective. The ability of a contract to facilitate exchange depends on the "completeness" of the contract and the relevant body of contract law. A *complete contract* eliminates opportunistic behavior by stipulating each party's rights and responsibilities for every conceivable contingency that might arise during the course of the transaction. To design a complete contract, the parties must be able to anticipate all possible contingencies and agree on the set of

actions each must take in response. They must also be able to measure performance and to agree on what constitutes satisfactory performance, and the contract must be enforceable. The severity of these requirements quite often leads to "incomplete" contracting.

An *incomplete contract* is a contract in which the rights, responsibilities, and actions of the parties involved are not fully specified. Incomplete contracts involve some degree of open-endedness or ambiguity and arise because the parties cannot anticipate all possible contingencies or are unable to specify the performance obligations exactly. Three factors can contribute to incomplete contracting: bounded rationality, difficulties in specifying or measuring performance, and asymmetric information. Bounded rationality refers to the limits on the capacity of individuals to process information, deal with complexity, and pursue rational aims. Asymmetric information exists when the parties do not have equal access to all information relevant to the contract and may result from either hidden information or hidden action. Hidden information is information about the conditions of the contract that is held by one party but that other parties do not hold or cannot learn. A hidden action is an action taken by one party that affects contract performance but cannot be observed or verified by other parties.

Hidden information and hidden action relate respectively to the problems of *adverse selection* and *moral hazard.* Adverse selection is a term that originated in the insurance industry, where it refers to the adverse effect the self-selection of individuals with hidden information on their situations has on the cost of providing insurance. Milgrom and Roberts (1992) describe the adverse selection problem that would arise if an insurance company were to issue a health insurance policy that offered complete coverage of the medical costs associated with pregnancy and child delivery. The insurance company could expect a disproportionately high number of individuals with plans to bear children in the near future to purchase the policy. Because childbearing plans are privately known and an unobserved characteristic of insurance buyers, the company would be unable to prevent this adverse selection problem, and the costs of providing the policy could be expected to increase substantially. The moral hazard concept is associated with hidden action and also originated in the insurance industry, where it is used to describe the changes in individual behavior, particularly risk taking, that might arise due to insurance coverage. For example, individuals with auto theft insurance may be more careless about locking their cars than if they did not have insurance (Besanko, Dranove, and Shanley 1996).

Both adverse selection and moral hazard have come to take on broader meanings in the transaction cost literature. Adverse selection generally refers to any circumstance in which one party has hidden information about intrinsic characteristics, such as preferences, technology, and risk, that could be relevant to contract performance. Likewise, moral hazard refers to a wide variety of circumstances in which parties can take actions that cannot be verified and therefore cannot be included in a contract.

The existence of a well-developed body of contract law can help prevent some of the problems of opportunism that can arise under incomplete contracting by specifying a set of standard provisions applicable to broad classes of transactions and by eliminating the need for parties to specify these provisions in every transaction. However, contract law is an imperfect substitute for complete contracting because the broad language of contract law is subject to differing interpretations when applied to specific transactions and because litigation to resolve contractual disputes can be costly. Consequently, incomplete contracting will inevitably result in opportunism and transaction costs.

Much of transaction cost analysis focuses on the opportunism that can be associated with *relationship-specific assets.* A relationship-specific asset is an asset that is purchased in support of a specific transaction. Asset specificity can take at least four different forms: site specificity, physical asset specificity, dedicated assets, and human asset specificity. Site specificity involves assets that are located nearby to economize on transportation or inventory costs or to achieve processing efficiencies. Physical asset specificity is associated with assets with physical properties specifically tailored to a particular transaction. Dedicated assets are assets in which an investment is made on the basis of a promise of a particular customer's business and, without which, would not be profitable. Human asset specificity refers to acquired skills and knowledge of a group of workers that are more valuable within a particular relationship than outside it and that may interfere with a conversion to another relationship.

Generally, the owner of a relationship-specific asset cannot redeploy the asset in support of another transaction without incurring some loss in its productivity or some cost in adapting it to another use. As a consequence, when a transaction involves relationship-specific assets, the parties in the transaction cannot abandon the relationship and seek other trading partners costlessly.

The need to invest in relationship-specific assets creates what Williamson (1985) calls a *fundamental transformation* in the relationship. Before investments in relationship-specific assets are made, a party may have many alternative trading partners, which enables competitive bidding. However, once the relationship-specific investments have been made, the parties may have few, if any, alternative trading partners and competitive bidding is no longer possible. The fundamental transformation leads to the creation of *quasi-rents,* which, in turn, can lead to opportunistic behavior.

A quasi-rent is the portion of a relationship-specific asset's earnings in excess of the minimum required to keep the owner from exiting the relationship once the investment has been made. In other words, a quasi-rent is the difference between the revenue the owner of the asset actually receives and the revenue the owner must receive to be induced not to exit. Generally, to be induced not to exit, the owner of a relationship-specific asset must receive revenue sufficient to cover the sum of the earnings of the asset in its next-best use (its ex post opportunity cost) and the variable costs of production. A quasi-rent differs from a rent in that a rent is the difference between the revenues the owner of a relationship-specific asset would receive under the terms of a contract and the revenues the owner must receive to induce it to invest in the asset. To be induced to invest in a relationship-specific asset, the owner generally must receive revenue adequate for covering the sum of the annualized cost of the asset (its ex ante opportunity cost) and the variable costs of production.

A quasi-rent may exist even if there is no rent. When there are alternative suppliers of the relationship-specific asset, competitive bidding for the contract may drive the rent to zero. However, once the investment in the relationship-specific asset has been made, the asset's opportunity cost will drop because its value in its next-best use will be less than its value in its current use. As a result, a quasi-rent will be created.

Even when there is a competitive ex ante contracting environment, the existence of quasi-rent encourages opportunistic behavior by the buyer and seller. A seller, knowing that a buyer is dependent upon the relationship for its supply, may attempt to exploit the buyer by claiming production costs have increased and by demanding an upward renegotiation of the price. Similarly, a buyer, realizing that a seller has limited opportunities for redeploying a relationship-specific asset, may seek more favorable terms by renegotiating the contract. These are examples of the type of post-contractual

opportunistic behavior known as the *holdup problem* that arises when one party in a contractual relationship seeks to exploit the other party's vulnerability due to relationship-specific assets. A characteristic of the holdup problem is the redistribution of quasi-rents through either contract renegotiation or unilateral actions that benefit one party at the expense of the other.

The classic example of the holdup problem, described by Klein, Crawford, and Alchian (1978), involves the dies used to form steel into the specific shapes necessary for the body of a particular automobile. Although the dies are very expensive, costing millions of dollars, they are essentially worthless if not used for the purpose for which they were designed. If the dies are purchased and owned by an outside part supplier, the supplier will be vulnerable to holdup by the automobile manufacturer. Because the original contract will probably be incomplete, it is likely that, once the investment in the dies has been made, situations will arise that will require the parties to negotiate the nature and terms of their future interactions. Such ex post bargaining may allow the manufacturer to exploit the fact that the dies have no alternative uses to force a price reduction. This would enable the manufacturer to gain some of the returns to the investment that otherwise would have gone to the supplier and that had motivated the supplier to make the investment in the first place. As a result of the holdup, the supplier may no longer be willing to purchase relationship-specific assets or may begin to invest in measures designed to protect it from the threat of future holdups. Consequently, it is typically the auto manufacturer that owns the dies.

The holdup problem can increase the costs of transacting with other parties by necessitating more difficult contract negotiations and more frequent renegotiations, encouraging investments to improve ex post bargaining positions, and discouraging investment in relationship-specific assets. To avoid these inefficiencies, firms may choose vertical integration as an alternative to market exchanges.

More generally, an important premise of transaction cost economics is that the important dimensions of an individual transaction can be identified, and they can be used to determine the most efficient institutional arrangement for conducting the transaction. Essentially, a firm should select the institutional arrangement that minimizes the sum of its production and transaction costs. Williamson (1985) argues that three characteristics of a transaction are critically important in determining the optimal institutional arrangement: frequency, uncertainty, and, especially, asset specificity.

Each of these characteristics is expected to favor the adoption of an internal mechanism for coordinating the transaction instead of relying on market exchanges. Higher levels of uncertainty and greater degrees of asset specificity, particularly in combination, are expected to create a more complex contracting environment and a greater need for post-contractual adjustments. Consequently, a hierarchical relationship, in which one party has control over both sides of a transaction, is expected to resolve potential disputes more efficiently than a market relationship. Frequency of transaction is also an important determinant because the fixed costs of creating a nonmarket institutional arrangement are averaged out over more transactions, the more often the transaction occurs.

Agency Theory

Agency theory concerns the problems of agency relationships, which exist whenever one individual, called the *agent,* acts on behalf of another, called the *principal.* Generally, the principal owns an asset and employs an agent to increase its value. Because the

objectives of the agent generally are not identical to those of the principal, the agent may not always best represent the interests of the principal.

The concepts of the agency relationship and the *principal-agent problem* appeared in *The Modern Corporation and Private Property,* in which Berle and Means (1932) argued that separation of ownership and control could lead managers to pursue their own objectives at the expense of the owners. Important contributions to analyzing agency problems include Ross (1973), Jensen and Meckling (1976), Fama (1980), and Fama and Jensen (1983).

The terms of an agency relationship generally are defined in a contract that specifies the compensation to be paid by the principal to the agent conditional on the execution of specific actions by the agent and/or the observation of particular outcomes by the principal. Contracts can be either explicit, in which the terms are written and legally enforced, or implicit, in which the terms are generally understood and enforced by reputation effects and the desire to maintain long-term relationships.

Problems in the principal-agent relationship due to diverse objectives could be eliminated if the principal and agent were able to agree on a contract that would bind the agent to act in the principal's interests. However, because contracts are generally incomplete, there are opportunities for shirking due to moral hazard and imperfect observability. Consequently, the primary focus of agency theory is on incentive and measurement problems, and, whereas the basic unit of analysis in transaction cost economics is the transaction, in agency theory it is the individual (Mahoney 1992).

Jensen and Meckling (1976) argue that if managers own only a share of a company's equity, they will overindulge in perquisites because they receive all the benefits of the perquisites while bearing only some of the costs. Jensen and Meckling then analyze which ownership and capital structures can be used to lower agency costs. For example, they contend that when managers need external financing for capital investments, they will rely more heavily on debt financing than equity financing because it allows them to maintain a higher proportion of the firm's equity and it provides them an incentive not to consume excess perquisites. Since Jensen and Meckling, much of agency theory has built upon their insights by describing different types of agency costs and other methods by which those costs can be mitigated.

A major focus of the agency theory literature has been the emergence and performance of complex economic organizations in which ownership and control are separated and how the problems caused by this separation can be mitigated through the design of the firm's capital structure and the compensation of managers. From an agency theory perspective, an organization can be viewed as a "nexus of contracts" between individual economic agents who supply resources to a productive activity in exchange for various claims on the cash flows generated by the activity (Fama 1980). According to Fama and Jensen (1983), the emergence of complex organizations can be attributed to the advantages of having management and risk-bearing services provided by agents who are knowledgeable and skilled in these activities. Managers provide decision-making services to the organization in exchange for fixed claims on its cash flow and do not directly bear the financial risks of their decisions. Other individuals provide capital resources to the organization and accept its financial risks in exchange for the "residual claims" on the cash flow, i.e., the difference between the organization's income and the fixed claims. Contracts specify the nature of the residual claims and the allocation of the decision process among the individuals in the organization.

Fama and Jensen relate the performance of these organizations to the tendencies for utility-maximizing managers to engage in decision behavior that reduces the value of

residual claims and the operation of mechanisms that arise within these organizations to constrain such behavior. They also argue that when residual risk bearing is separated from decision management (the initiation and implementation of decisions), decision systems will evolve to separate decision management from decision control (the ratification and monitoring of decisions). In complex corporations, in which residual claims are represented by transferable shares, decision control is exercised both by a board of directors and the operation of a market for the organization's stock. According to Fama and Jensen, stock prices are signals that summarize the implications of the organization's decisions for current and future cash flows, and they place pressure on the managers to direct the decision process toward the interests of the residual claimants. This decision control mechanism is enhanced by the existence of stock analysts and the ability of stockholders to consolidate voting power through proxy fights and corporate takeovers.

Property Rights Analysis

Under the assumptions of the neoclassical model, property is privately held and property rights are exclusive and voluntarily transferable. Because transaction costs are assumed to be zero, these property rights can be fully defined, allocated, and enforced and, regardless of their initial assignments, they will be reallocated to those uses in which they yield the highest value. However, the introduction of positive transaction costs implies that some rights to resources will not be fully assigned or priced, thereby reducing an individual's incentive to consider fully all costs and benefits stemming from his or her decisions. Furthermore, other property rights structures may be chosen because they provide greater utility or are beneficial to specific groups that possess a comparative advantage in terms of political power. Different systems of property rights provide decision makers with different incentive structures, resulting in different assignments and uses of resources.

Even when property rights are privately held and fully allocated, the existence of transaction costs implies that there will be shirking and other deviations from the efficiency conditions dictated by neoclassical theory. Moreover, if private property rights are diluted by government regulation or mutual ownership, for example, or replaced by other institutional arrangements, such as government ownership or worker management, deviations from the neoclassical conditions will be even more pronounced. For example, the critical difference between private and publicly owned firms is that ownership of public firms is effectively nontransferable. This precludes specialization in ownership and capitalization of future values into share prices, thereby reducing the incentive for stockholders to monitor managerial performance. Therefore, managers of publicly owned firms may have greater opportunity for discretionary behavior than managers of private firms and are less likely to minimize costs and to produce a variety of outputs.

In an important work, Grossman and Hart (1986) developed a theory of property rights that provides an alternative to the transaction cost model for analyzing the optimal institutional arrangements for coordinating transactions.[2] The theory, which is based on the importance of asset ownership and control, has been developed further by Hart and Moore (1990) and Hart (1995). As in transaction cost economics, contracts are incomplete because it is impossible to specify every possible contingency and an agreement for every one.[3] However, in contrast to transaction cost economics, standard property rights models assume that all bargaining, including bargaining occurring after investments are made, is efficient. In addition, uncertainty, frequency, and the degree of

asset specificity generally are not included in these models. As a consequence, the outcomes of the models depend only on how ownership affects initial investments.

In Grossman and Hart's model, the ownership of nonhuman assets is the defining characteristic of firms—a firm is simply a set of assets under common ownership. If two different assets have the same owner, there is a single, integrated firm; if they have different owners, there are two firms and the dealings between them are market transactions. Decisions about asset ownership are important because control over assets gives the owner bargaining power when unforeseen or uncovered contingencies force parties to negotiate how their relationship should be continued. The owner of an asset can decide how it should be used and by whom, subject only to the constraints of law and the obligations implied by specific contracts. Assets become bargaining levers that influence the terms of new agreements and, hence, the future payoffs from investing in the relationship.

Grossman and Hart define the *residual rights of control* as those rights that the owner of an asset retains when it grants another party the right to use the asset, and they consist of all those rights of control that are not explicitly specified in the contract.[4] Ownership is transferred when these residual rights of control are sold, fundamentally changing the legal rights of both parties.

Grossman and Hart's theory analyzes the importance of asset ownership under incomplete contracting. They observe that if contracts were complete, it would not be important who owned an asset. A complete contract would specify exactly what actions should be taken by each party under every possible contingency as well as the compensation each party would receive. Consequently, it would not matter whether a firm coordinated transactions internally or externally. However, for reasons already discussed, contracts may be incomplete.

The theory focuses on two units that can enter into an exchange relationship and distinguishes between two types of decisions—contractible and noncontractible decisions. The contractible decisions consist of a pair of verifiable operating decisions. The noncontractible decisions consist of a pair of unverifiable up-front investments in relationship-specific assets. The parties negotiate over the operating decisions, but if the negotiations over a particular operating decision break down, the control over that decision reverts to the party that holds the residual rights of control over those assets relevant to the decision.

Grossman and Hart analyze three organizational arrangements:

> ***Nonintegration,*** in which the units are independent firms, each has control over its own assets, and each makes its own operating decisions in the absence of a negotiated contact on those decisions.
>
> ***Forward integration,*** in which Unit 1 has control over both operating decisions by purchasing control over Unit 2's assets.
>
> ***Backward integration,*** in which Unit 2 has control over both operating decisions by purchasing control over Unit 1's assets.

Grossman and Hart argue that because asset ownership determines control over the assets when the units cannot reach an agreement, the form of integration affects the bargaining power of the two units during the negotiations over the operating decisions, which, in turn, determines the distribution of the quasi-rents that results from the negotiations. Because the units anticipate the results of the negotiations, the distribution

of the quasi-rents influences each unit's incentives to invest in the unverifiable relationship-specific assets. Those investments determine the total profits or quasi-rents from the relationship. Consequently, the benefits and costs of each form of integration depend on the sensitivity of these total profits to each unit's investment in the relationship-specific assets.

Using this framework, Grossman and Hart argue that the incentives for a unit to make unverifiable investments are related to the scope of that unit's control of the relationship, and they conclude that the unit whose investments have the greatest impact on the total profits should be the unit that is given ownership. For example, forward integration is optimal if Unit 1's investment in relationship-specific assets has a greater impact on profits than Unit 2's investment. Nonintegration is optimal if the investments of both units have the same impact on profits.

By focusing on the importance of asset ownership, this theory clarifies the concept of vertical integration and implies differing degrees of vertical integration, which depend on the extent to which specialized assets are controlled by one party or the other. This clarification is especially useful in describing those relationships that seem to fall somewhere between vertical integration and market exchanges. The focus on asset ownership also suggests that physical and human asset specificity may have different implications for the degree of vertical integration. The ownership of specialized human assets frequently cannot be transferred, unlike that of physical assets. Therefore, one can expect the optimal degree of vertical integration to be affected by both the degree and form of asset specificity.

Applications to the Cooperative Organizational Form

Applying concepts from transaction cost economics, Staatz (1987a) examined the conditions under which farmers benefit from collective action and the conditions under which that action is likely to assume the form of a cooperative. He observed that many of the benefits cooperatives have to offer farmers stem from the holdup problem and the opportunistic behavior associated with asset fixity.

The standard example of the holdup problem in agriculture involves the producers and processor of a perishable commodity. If an alternative buyer does not exist, producers may be susceptible to holdup by the processor. Once harvest approaches, the processor can refuse delivery of the commodity in an effort to force producers to accept a lower price. Producers, who face having their crops ruined by spoilage, are pressured to accept the processor's terms. A processor who has made idiosyncratic investments in plant and equipment geared toward processing the commodity is also susceptible to the threat of a holdup by the producers if there are no other suppliers. Again, vertical integration is one solution to the holdup problem. Producers can eliminate or minimize the possibility of holdups by purchasing the processing plant or by forming a bargaining association.

According to Staatz, asset fixity and the holdup problem underlie arguments that cooperatives are necessary to provide farmers market power and to guarantee their access to markets.[5] He argues that cooperatives are more likely to arise when assets on both sides of the market are highly specialized and when product and factor markets are fragmented, leading to a disparity between the value of an asset in its current use and its value in alternative uses. He also suggests that cooperatives will tend to be more prevalent in declining markets than in expanding markets where the long-term

consequences of acting opportunistically toward farmers may be more important because of the threat of entry by competing firms.

Staatz observes that the potential for opportunistic appropriation of quasi-rents from farmers is exacerbated by the risk inherent in agriculture and suggests that cooperatives may provide farmers some advantages in dealing with risk. He also argues that farmers may integrate vertically through cooperatives to internalize externalities imposed upon them by trading partners or to provide themselves goods and services of the nature of a public good, which no other firm would have an incentive to offer.[6] However, he states that most of the cost savings he attributes to cooperatives could be achieved by noncooperative firms owned primarily by farmers.

More recently, Balbach (1998) analyzed the contracts used in the U.S. beet sugar industry, in which three of the nine processing companies are grower-owned cooperatives. Only the cooperative processors use contracts under which grower payments are based on the extractable sugar content of their beets. Because of these contracts, growers have an incentive to produce higher-quality beets and the cooperatives have been able to reduce their processing costs. According to Balbach, noncooperative processors have not adopted extractable-sugar contracts because processors have an incentive to underreport quality and because the costs to growers of monitoring a processor's quality measurements are too high. Presumably, these monitoring costs are lower for cooperative growers because, as owners of the processor, they have greater trust in the measurements.[7]

Problems Intrinsic to the Cooperative Organizational Form

The concept of the cooperative as a solution to the holdup problem is widely accepted by economists. Within that context, much of the work applying neo-institutional concepts to cooperatives has focused on describing problems inherent in the cooperative organizational form that create disadvantages for cooperatives and their members. Important contributions in this area have been made by Vitaliano (1983), Caves and Petersen (1986), Porter and Scully (1987), and Staatz (1987b). The following list is taken from Cook (1995). It includes the *horizon, portfolio, control, free-rider,* and *influence costs problems.*

Three of these problems—the horizon, portfolio, and control problems—were described by Jensen and Meckling (1979) in the context of the labor-managed firm but are applicable to cooperatives as well. All three relate to the *transferability problem* that exists in both labor-managed firms and cooperatives and that stems from the structure of property rights within these organizations. In a cooperative, the residual claims to the organization's cash flow usually are distributed to members in the form of patronage dividends or favorable prices.[8] In addition, restrictions generally are placed on the transfer of the rights to these residual claims, i.e., ownership is limited to members, who must be producers and active patrons of the cooperative. As a result, the flow of future residual claims cannot be capitalized into stock values and transferred to investors through a secondary equity market. This transferability problem creates other problems for cooperatives that do not exist in corporations, at least to the same extent.

Horizon Problem

The horizon problem arises when an investor's claim on the net cash flow generated by an asset is expected to terminate before the end of the asset's useful life. As a consequence, the investor is likely to underinvest in the asset because the return to the

investor is less than the return generated by the asset. The horizon problem occurs in cooperatives because of the structure of the rights to residual claims. Because residual claims are distributed to members as current payments, the benefits a member receives from an investment is limited to the time horizon over which the member expects to patronize the cooperative.

Differences in investment preferences are expected to arise among subgroups within the cooperative, based on their respective time horizons, but because of the horizon problem, cooperatives will tend to underinvest in assets with long-term payoffs, particularly research and development, marketing, and other intangible assets. The horizon problem also encourages managers and boards of directors to increase current payments to members instead of investing in additional assets and to accelerate equity retirement rather than building the level of equity in the organization. Staatz (1987b) suggests that the horizon problem can be mitigated by linking membership to the sale of a member's farm or establishing tradeable delivery rights, in which cases the value of the cooperatives could be capitalized.

Portfolio Problem

The portfolio problem occurs because cooperative members invest in the cooperative in proportion to their use and because equity shares in the cooperative generally cannot be freely purchased or sold. Therefore, members are unable to diversify their individual investment portfolios according to their personal wealth and preferences for risk taking. Furthermore, because outside investors, who could diversify the risks of the cooperative, generally are excluded from investing in a cooperative, members must shoulder these risks alone. Consequently, members are expected to require higher returns on cooperative investments and to be more reluctant to invest in new assets than corporate shareholders. This problem is exacerbated to the degree members' investments in the cooperative represent a high proportion of their off-farm assets and to the extent the risks associated with the cooperative enterprise are positively correlated with the risks related to members' own farming activities (Royer 1995).

Control Problem

Principal-agent problems exist to some extent within any organization in which there is separation of ownership and control. However, there are reasons to expect these problems are more serious in cooperatives because of the absence of a market for exchanging equity shares and the lack of equity-based management incentive mechanisms available to other firms. The inability of cooperative members to trade equity shares among themselves prevents the concentration of equity in the hands of a few shareholders, thereby diluting the incentive for individual members or boards of directors to make difficult decisions concerning innovation, disciplining management, or initiating management change. The absence of an equity market also deprives members of a means for monitoring the cooperative's value and evaluating management's performance. Because cooperatives cannot use equity ownership or purchase options to compensate or motivate management, they may be at a disadvantage in attracting and retaining good managers. Harte (1997) contends that the lack of equity incentive schemes provides managers an incentive to encourage their cooperatives to convert into corporations.

Requirements that restrict cooperative membership to producers can contribute to the control problem. The production orientation of cooperative boards of directors increasingly limits their ability to monitor management performance as the organization

expands and becomes more oriented toward consumers. Generally, the management skills that are necessary become broader, and the management team must include more specialists. Businesses that compete with cooperatives frequently include on their boards specialists in fields that are important to their operations, such as finance, law, administration, and accounting. Cooperatives, however, usually are precluded from building this type of board by the restrictions on membership (Jamison 1960).

Free-Rider Problem

The free-rider problem is a type of common property problem that emerges when property rights are not tradeable or are not sufficiently well defined and enforced to ensure that individuals bear the full cost of their actions or receive the full benefits they create. Common property problems are frequently called free-rider problems in situations where it is difficult to exclude individuals who do not pay for consuming the benefits arising from a resource.

Free-rider problems are frequently associated with cooperatives, and they may occur either inside or outside the organization. For example, a nonmember producer may benefit from the terms of trade negotiated by a bargaining association or the value of a cooperative processing facility may be capitalized into the resale price of a nearby farm. Free-rider problems inside a cooperative stem from the fact that the rights to the residual claims generally are tied to patronage instead of investment. New members usually are not required to make up-front investments proportionate to their use, and yet they receive the same rights to residual claims as existing members and they are paid the same patronage dividend per unit.

The free-rider problem can create differences in preferences among various subgroups, based on how long they have held their residual claims. However, the general tendency of the free-rider problem is to encourage decisions that increase cash flows per member. Because of the dilution of returns to existing members, a disincentive for investment is created. The free-rider problem can be attenuated by restricting membership when the effects of decision can be captured fully within the cooperative, expanding membership when this is not the case, charging new members substantial entry fees, or adopting a base capital financing plan (Vitaliano 1983).

Influence Costs Problem

According to Cook, if a cooperative engages in a wide variety of activities, diverse objectives among its members can lead to costly influence activities. *Influence costs* are those costs associated with activities in which members or groups within an organization engage in an attempt to influence the decisions that affect the distribution of wealth or other benefits within the organization. Influence costs include both the direct costs of influence activities and the costs of poor decisions caused by influence activities (i.e., the costs associated with the misallocation of resources due to the successful exercise of influence). Influence activities are possible only if there is a central authority who possesses the ability to affect the distribution of costs and benefits among individuals. The importance of these activities and the resulting costs depends on the procedures that govern decision making and the degree of homogeneity or conflict in the interests of the individuals within the organization (Milgrom and Roberts 1990, 1992).

Cook does not present arguments for why cooperatives may have greater influence costs than other organizations. However, it is likely that the interests of cooperative members, which are linked to individual farm production activities, are more diverse than the interests of corporate stockholders, who share a common objective of

maximizing wealth. Staatz (1987b) suggests that cooperatives may have higher decision costs than other firms.[9]

Cooperative Life Cycle Models

The existence of these problems has led some authors to hypothesize that, although cooperatives may initially serve some economic purpose within a market, they eventually will be forced to exit or reorganize as the market evolves because of inherent weaknesses attributable to the structure of their property rights. Two authors, Cook (1995) and Harte (1997), have formalized these ideas in cooperative life cycle models, which seek to explain the formation, growth, and eventual decline of a cooperative.

Cook's Five-Stage Model

Cook's model of "cooperative genesis, growth, and demise" (p. 1155) based on transaction and agency costs consists of five stages:

Stage 1: Producers form a cooperative for one of two economic reasons: (1) they need an institutional mechanism for achieving control over the balance of supply and demand in a market because of low prices resulting from excess supply or (2) they need an institutional mechanism for countervailing opportunism and holdups due to market failure.

Stage 2: According to Cook, a cooperative organized to contend with a market failure generally can market products or supply farm inputs at more favorable prices than investor-owned oligopsonists or oligopolists. Consequently, they usually survive the infancy stage. On the other hand, cooperatives formed because of excess supply and low prices have little economic impact on the livelihood of their members and are usually short-lived.

Stage 3: A cooperative that survives Stage 2 generally becomes successful in remedying or allaying the negative economic effects stemming from the market failure. In reaction to the cooperative's presence in the market, competitors adjust their strategic behavior and their prices begin to approach those of the cooperative. As the difference between the prices of the cooperative and its competitors decreases, the costs of transacting with the cooperative become increasingly important to the cooperative's members. Specifically, five problems intrinsic to the cooperative organizational form come into play. These problems are the horizon, portfolio, control, free-rider, and influence costs problems.

Stage 4: The decision makers within the cooperative become increasingly aware of these problems as well as the benefits stemming from the cooperative that might be lost if it were to discontinue operations. Discussion and analysis of these tradeoffs, the competitive role of the cooperative, and its sunk-cost investments lead to a recognition of the long-run strategic options available to the cooperative. By the end of this stage, the cooperative concludes that its options consist of: (1) *exit,* (2) *continue,* or (3) *transition.*

Stage 5: The cooperative's leadership chooses from among those strategic options.

According to Cook, a cooperative has two alternatives available under the exit option: (1) liquidate or (2) restructure as an investor-owned stock corporation. He cites Schrader (1989), who suggests that poorly performing cooperatives generally decide to liquidate or merge with other cooperatives whereas well-performing cooperatives restructure as investor-owned stock corporations.

A cooperative that chooses to continue operating tends to be undercapitalized because of the cooperative structure of property rights. Consequently, such a cooperative has two alternatives: (1) seek external equity capital without restructuring as an investor-owned corporation or (2) generate additional equity internally by pursuing a strategy based on proportionality. The cooperative may seek external equity capital by forming publicly held subsidiaries, joint ventures with other cooperatives or with noncooperative firms, or limited liability companies with various partners.[10]

Under an internal equity acquisition strategy based on proportionality, the cooperative would be restructured so that governance and the responsibility for financing the cooperative are maintained in proportion to individual patronage. Cook lists base capital plans, proportional voting, narrowing product scopes, pooling on a business-unit basis, and capital provision on a business-unit basis as mechanisms for such a restructuring. He also mentions the "patron-owned corporation" (POC), defined and described by Royer (1992). The POC is an organization in which control is held in proportion to common stock holdings, earnings are distributed in proportion to stock holdings, retained earnings are not allocated to individual owners, and owners share in equity appreciation through a secondary equity market.

By the transition option, Cook means conversion to a "new generation" cooperative. A new generation or "value-added" cooperative, which is described and discussed by Harris, Stefanson, and Fulton (1996), is characterized by value-added processing activities and a linkage of producer capital contributions to product delivery rights. Equity shares and the associated delivery rights can be traded, and share prices can appreciate, reflecting the returns members expect to receive over time. These cooperatives, which share some characteristics with POCs, represent an attempt to correct the problems stemming from the structure of property rights associated with traditional cooperatives while preserving the cooperative character. An attractive feature of these organizations is that they are financed in proportion to use.

Despite its advantages, however, the new generation model is not without drawbacks. The need for significant up-front capital contributions tied to delivery rights establishes financial barriers to new membership, and, through capital appreciation, initial investors in these cooperatives may be rewarded on the basis of share holdings instead of use. Substantial capital appreciation also has created barriers to exit, preventing retiring producers from liquidating their equity shares and stimulating the creation of leasing arrangements by which newer members lease deliver rights from older ones. Some new generation cooperatives facilitate membership by allowing new members to purchase shares over a period of several years.

Harte's Life Cycle Model

In Harte's (1997) life cycle model, cooperatives are initially useful instruments for correcting or mitigating market failures. However, as market performance improves, the need for cooperatives diminishes. According to transaction cost theory, efficient governance structures can be expected over time to replace inefficient structures in competitive markets. Thus, to the extent that cooperatives are less efficient than corporations, we can expect a transition from the cooperative organizational form to the

corporate form. The progression of the life cycle will depend on the dynamics of the particular market. Cooperatives would be expected to persist indefinitely only in the case of chronic market failure.

Harte uses his life cycle model to explain the recent conversion of several Irish dairy cooperatives to public limited companies, which are the equivalent of corporations or investor-owned firms. Confirmation of Harte's life cycle hypothesis, applied to these cooperatives, would depend on demonstrating that the Irish dairy industry is competitive and would remain so after conversion of the dairy cooperatives to corporations. Harte reviews the current structure of the Irish market for milk, concluding that there is little evidence of poor market performance and, therefore, little need for Irish dairy producers to integrate forward into processing and marketing activities through cooperatives. Harte's assessment is based on the level of processor concentration, the degree of product homogeneity and market transparency, and the market power of producers, which has been enhanced by a milk quota system that increases the barriers to entry for dairy farming. It is more difficult to evaluate the future performance of the market, particularly under further weakening of the European agricultural support programs and the expected rationalization and decline in the number of processors. However, Harte contends that future competition in the dairy industry would be best assured by the existence of publicly quoted corporations.[11]

Statistical Analyses of Cooperative Efficiency

Two types of empirical analyses are relevant to further confirmation of the life cycle hypotheses: (1) statistical analyses of the comparative efficiency of cooperatives and (2) ex post studies of cooperative conversions. Studies of the comparative efficiency of cooperatives in the dairy industry include Babb and Boynton (1981), Porter and Scully (1987), Parliament, Lerman, and Fulton (1990), Ferrier and Porter (1991), and Gentzoglanis (1997). General studies and studies outside the dairy industry include Hollas and Stansell (1988) on electric utility companies, Venieris (1989) on the Greek wine industry, Lerman and Parliament (1990) on fruit and vegetable processing firms, Royer (1991) on thirteen marketing, farm supply, and service industries, including the dairy industry, and Akridge and Hertel (1992) on grain and farm supply firms.

Of these, the most important has been the Porter and Scully study in terms of its influence on subsequent analyses and its reliance on neo-institutional economic concepts. Porter and Scully argue that cooperatives are characterized by the horizon, transferability, and control problems and that these problems lead to technical, allocative, and scale inefficiency.[12] According to Porter and Scully, because of the horizon problem, cooperatives are less likely than other firms to undertake long-term investments, particularly in intangible assets. This prevents them from choosing the optimal mix of inputs and results in allocative inefficiency. Cooperatives are also hypothesized to be technically inefficient because of the transferability problem. Because cooperative stock is not transferable, cooperatives are unable to rely on stock prices as a barometer of performance, and because ownership is generally dispersed over many members, individual members have limited incentives to monitor performance. Consequently, managers are more likely to shirk and pursue other objectives than cost minimization, which is necessary for the maximization of member benefits. Finally, the control problem may result in scale inefficiency because of the increasing agency costs that are associated with the large membership necessary for achieving scale economies.[13]

Applying a statistical frontier production function approach to data from cooperative and noncooperative fluid milk processing firms, Porter and Scully concluded that the cooperative firms were less efficient than the noncooperative firms and that the relative inefficiency of the cooperatives could be attributed to intrinsic weaknesses in the property rights structure of the cooperatives instead of the pursuit of alternative objective functions. Using a linear programming approach and the same data, Ferrier and Porter (1991) reached similar conclusions.[14]

According to Porter and Scully, cooperatives survive, despite their relative inefficiency, because of favorable tax treatment provided by the Internal Revenue Code, favorable credit terms provided by the Farm Credit System, and free services provided by the U.S. Department of Agriculture. Although they acknowledge that the cost of milk processing by cooperatives may be overstated because cooperatives provide services to members not offered by noncooperative processors, they argue that this bias is offset by the fact that cooperatives probably prefer leasing relative to other firms and are likely to use older facilities, both of which would tend to understate total assets and increase their estimated efficiency. They also recognize that the existence of cooperatives may enhance market performance by mitigating monopsonistic exploitation by processors and that the vertical integration represented by cooperatives may lower transaction costs. However, they argue that a redistribution of resources from cooperatives to other dairy processors would benefit society by increasing output.

Sexton and Iskow (1993a and 1993b) review several of the comparative efficiency studies already mentioned and conclude that there is no consensus as to whether cooperatives are less efficient than other firms. Furthermore, they argue that the limited number and scope of these studies restricts the inferences that can be drawn from them. They observe that Babb and Boynton (1981) and Parliament, Lerman, and Fulton (1990), using other analytical techniques, reached conclusions different from those presented in Porter and Scully and in Ferrier and Porter.

Sexton and Iskow expose several biases in the latter studies that generally tend to underestimate the efficiency of cooperative organizations. They point out that because cooperative and noncooperative dairy processors are not uniformly distributed across states, the use of a national average wage rate affects calculations of allocative efficiency. They also argue that use of total assets inflates the measure of cooperative capital input and creates an illusion of technical and allocative inefficiency because cooperatives tend to hold a high proportion of current assets. Value-added is used as a proxy for physical output in these studies even though the marketing and promotion costs of creating and selling value-added products are not included in the studies. Sexton and Iskow contend that this measure of output makes cooperatives appear to generate less output and to be technically inefficient because they tend to operate in the low value-added fluid milk segment of the industry.[15] They also argue that because the high value-added segments of the industry are less competitive, the value-added in these segments may include monopoly overcharges.

Sexton and Iskow observe that the dairy industry consists of spatial markets created by geographically dispersed production and costly transportation and that optimal plant size is a function of both economies of size and increasing transportation costs. Cooperatives are more likely to operate small plants because regions with less concentrated production are more susceptible to monopsony problems and less likely to be served by profit-maximizing processors. Consequently, because the Porter and Scully study and the Ferrier and Porter study do not include transportation costs, Sexton and

Iskow contend that these studies are biased toward associating scale inefficiency with the cooperatives.

Sexton and Iskow note that the Babb and Boynton study and the Parliament, Lerman, and Fulton study of the dairy industry avoid the problems of geographic and product mix heterogeneity that flaw the studies by Porter and Scully and by Ferrier and Porter. However, they argue in favor of the formal efficiency concepts and the statistical and programming models used in the latter studies over the simpler statistical methods used in other studies. They criticize the use of financial ratio analysis in studies such as Parliament, Lerman, and Fulton because the ratios generally lack a rigorous foundation in economic theory and are difficult to interpret precisely. They also argue that ratio values may be influenced by the favorable public support of cooperatives.[16] Finally, they contend that examining data for only one part of the vertically integrated relationship between cooperatives and their members can lead to misleading results.

Sexton and Iskow call for additional research in this area and suggest that it should combine the rigorous measures of efficiency employed by Porter and Scully and by Ferrier and Porter and the careful sample selection procedures used by Babb and Boynton and by Parliament, Lerman, and Fulton.

Ex Post Studies of Cooperative Conversions

Analysis of the incentives cooperatives have had for converting to corporations and adopting related forms of business organization is fairly limited and informal. Schrader (1989) examined the motivations behind the restructuring of six financially successful cooperatives. Four of the cooperatives had ceased operating as cooperatives during the previous three years. Three of those cooperatives restructured themselves as investor-owned stock corporations or became part of a corporation, and the other was acquired by another cooperative. The two other cooperatives formed corporate subsidiaries and offered shares of these subsidiaries to the public. Schrader attributed the restructuring to financial pressures on farmers, a strong market for corporate securities, and the inability of members to benefit from the appreciation in the value of the cooperatives. He also noted that in five of the six cases, management believed that growth was essential for the continued viability of the organizations and that the growth rate was constrained by internally generated capital.

Collins (1991) studied five of the same cooperatives and extended Schrader's analysis to consider additional factors external to the cooperatives such as corporate management, personal portfolio management, and risk. After scrutinizing the public documents associated with the reorganizations, he concluded that the reasons offered by the cooperatives were not always credible. He attributed the restructuring to economic incentives and offered the following four hypotheses:

Equity Access Hypothesis: Managers seeking growth may look to external sources of equity if they want to avoid excessive debt and members are unwilling to provide additional investments.

Equity Liquidation Hypothesis: Members may have an incentive to liquidate their cooperative's equity when its market value exceeds its book value.

Corporate Acquisition Hypothesis: Corporations may consider a cooperative to be an attractive candidate for takeover, particularly if most members have a short time horizon and the cooperative can be acquired for less than its market value.

Cost-of-Equity Hypothesis: External equity is less expensive than equity provided by members.

Collins concluded that, although the evidence was very limited, it provided uniform support for only one hypothesis, the cost-of-equity hypothesis. He found that the evidence was inconsistent with the equity access hypothesis and that, although there was some support in the data for the equity liquidation and corporate acquisition hypotheses, not all the data supported them.

Using the capital assets pricing model, Collins estimated the systematic risk for the four cooperatives that issued stock as the result of a conversion, a merger, or the creation of a publicly held subsidiary. All four stocks exhibited very low levels of systematic risk whereas an analysis of publicly held agribusiness firms indicated they generally exhibited average systematic risk. On that basis, Collins concluded that there was an investor demand component behind the creation of the cooperative stock offerings. In other words, the cooperatives had an incentive to offer the stocks to the public because investors considered the stocks to be attractive because of the low systematic risk associated with them. As a result, the public offerings represented an inexpensive source of equity capital for the cooperatives.[17]

Both Jacobson (1992) and Harte (1997) have studied the conversion of Irish dairy cooperatives into public limited companies, or corporations. These studies are important because they shed light on the validity of Harte's cooperative life cycle hypothesis. According to Harte, Kerry Cooperative, the first of the dairy cooperatives to convert to a corporation, did so for reasons consistent with the equity access hypothesis advanced by Schrader and Collins.[18] Although access to additional capital was the primary issue raised in most of the other conversions, Harte concludes that the need for equity funding was not the reason for the conversions, consistent with Collins's rejection of the equity access hypothesis. During the conversions, leverage was relatively low in the Irish dairy sector, and the cash flows of the cooperatives greatly exceeded the levels necessary for maintaining capacity.

Jacobson analyzed fifteen Irish dairy cooperatives. Of the fifteen, seven had recently adopted some sort of corporate structure or had been acquired by corporations. The remaining eight had continued to operate as cooperatives. Jacobson attributed the conversion of the cooperatives to constraints on capital growth caused by a failure of the cooperatives to follow the basic cooperative principles of member ownership and operation at cost. In all fifteen cooperatives, net earnings had not been allocated to patrons and most equity was held in unallocated form. In addition, those cooperatives that operated equity retirement programs redeemed only minimal amounts of equity.

Leaders of the cooperatives that converted to corporations believed that external equity capital was necessary for pursuing their growth objectives because members were unwilling to contribute additional capital, a fact that Jacobson associated with the equity management practices of the cooperatives. Leaders of the organizations that continued to operate as cooperatives did not perceive that outside capital was required to pursue their business strategies. Jacobson characterized these cooperatives as placing a higher priority on paying producers the highest possible price for milk and on servicing member needs instead of on pursuing management-driven growth objectives.

Another consequence of the equity management practices of the cooperatives was that a relatively few shares of stock were associated with a substantial amount of net worth. Outside investors recognized this situation and offered shareholders of two of the cooperatives bids that induced them to dissolve the organizations.

Conclusions

Without doubt, the neo-institutional paradigms of transaction cost economics, agency theory, and property rights analysis have proven to be extremely useful tools for analyzing the cooperative organizational form and its institutional characteristics. Concepts derived from these approaches have produced a rich set of hypotheses about cooperative governance and financing as well as the comparative advantages of the cooperative organizational form and the prospects for its long-term survival in a rapidly changing economic environment characterized by globalization and agricultural industrialization.

It is toward this latter issue, the long-term survivability of the cooperative organizational form, that much of the neo-institutional thinking about cooperatives has been directed. The principal focus of these efforts seems to have been on uncovering institutional weaknesses inherent in the cooperative organizational form and on using these weaknesses to predict economic inefficiencies that will eventually lead to the decline of individual cooperative firms. In fact, this type of thinking has led both Cook and Harte to formalize these ideas in life cycle models, which inexorably lead to dissolution or conversion.

Yet the evidence produced by statistical studies of the comparative efficiency of cooperatives is far from conclusive. The studies have produced a morass of conflicting results, and, as Sexton and Iskow have so keenly demonstrated, the most important of these studies are so riddled with flaws that their results are of little use in formulating policy toward cooperatives. In addition, the few ex post analyses of why cooperatives have converted or assumed characteristics of the corporate organizational form are open to ambiguous interpretations.

More research obviously needs to be conducted. Sexton and Iskow's call for additional analysis on the comparative efficiency of cooperatives that combines rigorous measures and methods with careful sample selection procedures is certainly appropriate. Additional development and application of the methods Collins has pioneered to perform ex post analyses of cooperative conversions would also be very useful.

On a more basic level, a perusal of the current neo-institutional literature on cooperatives suggests that there may be a proclivity among scholars to apply the new and exciting concepts from transaction cost economics, agency theory, and property rights toward uncovering institutional weaknesses in the cooperative organizational form and confirming the hypothesis that cooperatives are doomed to inefficiency and failure. However, as Balbach's analysis of the contracts used in the beet sugar industry suggests, there may be circumstances under which neo-institutional concepts would predict that cooperatives are more efficient than other business forms. Certainly, more research focused on discovering and describing these situations would be valuable.

Applications of the new generation cooperative model imply that there are indeed situations for which the cooperative organizational form is appropriate once problems with the property rights structure are eliminated. However, new generation cooperatives are associated with their own set of problems, including barriers to entry and conflicts with important cooperative principles. The development of mechanisms for addressing

these issues would be worthwhile, and the neo-institutional paradigms of transaction cost economics, agency theory, and property rights analysis may be useful tools for developing them.

Notes

1. This section draws on several sources, but primarily De Alessi (1983), Besanko, Dranove, and Shanley (1996), Holmström and Roberts (1998), and Bolton and Scharfstein (1998).
2. An important earlier work is Demsetz (1967).
3. This literature on property rights theory (Grossman and Hart 1986, Hart and Moore 1990, and Hart 1995), as well as the transaction cost economics literature (e.g., Williamson 1985), in which it is impossible to specify complete contracts, is sometimes referred to as the "incomplete contracts" literature, as opposed to the "complete contracts" literature (e.g., Jensen and Meckling 1976).
4. This concept of ownership, based on residual rights of control, is distinct from the concept of ownership used in agency theory, which is based on residual claims (e.g., Fama and Jensen 1983).
5. Knoeber and Baumer (1986) examine the contracts of bargaining cooperatives and characterize them as guaranteeing a market for members by deterring opportunistic behavior by processors and growers.
6. Cooperatives do not integrate vertically in the sense that they internalize transactions with members, as Sexton and Iskow (1993a) observe. Sexton and Iskow argue that the cooperative organizational form allows cooperatives and their members to "harmonize" transactions because of their common interest—the maximization of payoffs to producer members. In contrast, in transactions between producers and other handlers, the interests of the producers and the handlers are inimical to one another.
7. Royer (1995) suggests cooperatives *may* have an advantage with respect to the adverse selection problem when selecting growers for contract production.
8. As such, cooperatives are examples of "tied-equity firms," firms in which the residual claims are contractually tied to a claimant's transactions with the firm instead of capital investments.
9. French et al. (1980) contend that one of the reasons diversified farm supply/marketing cooperatives have had only limited success in vertical integration is that membership in these cooperatives consists of a diverse set of producers. This broad range of producer interests makes it difficult to establish a specialized marketing program because of equity problems regarding the treatment of members who do not produce the commodity. Other cooperatives have encountered problems when they have sought to promote products (e.g., oleomargarine) that compete with commodities produced by members (e.g., dairy products) (Royer 1995).
10. There generally is a negative relationship between the extent to which decision-making rights are assigned to the providers of outside capital and the premium they must receive. Thus, according to Hendrikse and Veerman (1997), cooperatives are at a disadvantage in competing for external equity capital because of the member control requirement.
11. In addition to applying his life cycle arguments, Harte reviews transaction cost concepts that explain the current trend toward less vertical ownership and more vertical coordination. He reasons that because cooperatives represent a form of vertical integration, explanations for disintegration of the industrial sector should also predict the dissolution of cooperatives. He also draws analogies between the "privatization" of the Irish dairy cooperatives, the contemporaneous privatization of public sector enterprises, and recent management buy-outs without providing a common economic explanation except that they all represent attempts to minimize agency costs. Without additional specificity, the suggestion that these phenomena are related is not entirely convincing.
12. *Technical, allocative,* and *scale efficiency* are separable components of overall economic efficiency. Technical efficiency pertains to the firm's ability to produce the maximum output from a given set of inputs and is measured relative to a production frontier. Allocative efficiency concerns the firm's ability to minimize the cost of producing a particular level of output by selecting the optimal mix of inputs given input prices. Scale efficiency refers to the firm's ability to

select the optimal scale of production. See Porter and Scully (1987, 492 and 499–504) or Sexton and Iskow (1993a, 57–58).

13. Porter and Scully also cite legal, structural, and natural barriers to horizontal and vertical integration, including section 521 tax treatment, which limits nonmember business to 15 percent.

14. An advantage of this type of nonparametric frontier production model is that little structure is imposed on the data, i.e., the approach does not require a specific form for the production function and no distributional assumptions must be made about the error terms. A disadvantage is that the model attributes all deviations from the frontier to inefficiency (Ferrier and Porter 1991, 161).

15. The Porter and Scully study and the Ferrier and Porter study used data for the fluid milk processing industry (SIC 2026), which consisted of "establishments primarily engaged in processing (pasteurizing, homogenizing, vitaminizing, bottling) and distributing fluid milk and cream, and related products, including cottage cheese."

16. In addition to favorable tax treatment, favorable credit terms, and free services provided by the U.S. Department of Agriculture mentioned by Porter and Scully, Sexton and Iskow add the limited immunity from antitrust laws afforded by the Capper-Volstead Act.

17. The capital asset pricing model (CAPM) suggests that stocks with low systematic risk (i.e., stocks for which the return is independent of the returns to the market) will be attractive to investors because all nonsystematic risk can be costlessly eliminated by diversification. Therefore, investors require compensation only for only systematic risk and should be willing to bid up the price of a stock without systematic risk until they expect to receive only a riskless rate of return.

18. In addition, according to Harte, conversion of the cooperative to a corporation solved problems associated with the property rights structure. Employee incentives were increased through an equity participation plan and the use of stock options, benefits that allowed management to participate in the rewards of improved performance. The members portfolio problem also could be eliminated and the horizon problem no longer existed because the organization could rely on outside investors to provide additional equity.

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