

## **CHAPTER 2: REVIEW OF LITERATURE**

### **2.1 Introduction**

The search for literature that is applicable to solving the problems of beef alliances can easily become overwhelming. The vast majority of literature available to researchers focuses on the explanation of vertical coordination as an organizational form. These foundational pieces have been used as a base to analyze the multitude of issues that vertical coordination of an industry, firm, or relationship produce. At least three major theories of vertical coordination have been advanced, and continued research has produced more theories seeking to better explain the vertical coordination phenomenon.

Transactions cost theory, as defined by Williamson's advancement of Coase's pioneering work, is the most widely used framework for analyzing the variety of governance structures employed through vertical coordination. Agency theory, composed of both principal and positive agency theory, has also been used extensively as a theoretical framework for understanding and researching organizational structures (Jensen and Meckling; Eisenhardt). Resource-based theory is another branch of organizational economics concerned with the explanation of vertical coordination (Mahoney and Pandian; Conner). Additional frameworks for vertical coordination analysis include incomplete contracts (Hart), transactional values (Zajac and Olsen), strategic planning (Sauvee), and the strategic management/system dynamics approach (Cloutier, Sonka, and Westgren). This listing is not exhaustive and is only a brief overview of approaches available for analysis of vertical coordination.

Narrowing the literature search for guidance on the problems of beef alliances leads to a vertical coordination within agriculture subsection. The seminal piece discussing vertical coordination in agriculture came from Mighell and Jones. Heeding Mighell and Jones' call for more extensive knowledge of the causes and implications of vertical coordination within agriculture, researchers have produced a plethora of work. Using the theoretical frameworks described above, researchers have attempted to explain vertical coordination specifically within agriculture (Sporleder 1992; Barry, Sonka, and Lajili). Likely due to the high levels of coordinated contractual activity within the poultry and swine sub-sectors, a large majority of vertical coordination research focuses specifically on analyzing contracts (Knoeber; Knoeber and Thurman; Sheldon; Sherrick).

Literature on alliances is relatively sparse compared to the vertical coordination literature. Overall, it seems that while much has been written on the phenomenon of vertical coordination, little analysis has been performed on specific examples that fall between open markets and total integration on the coordination continuum, especially for strategic alliances and partnerships. In the strategic management literature, much qualitative information exists on how to manage alliances (Spekman et al.; Stafford), and there has been some advancement on how to view alliances with a combination of theoretical frameworks (Borys and Jemison; Ramanathan, Seth, and Thomas).

Literature on beef alliances specifically is lacking. Popular industry literature regularly promotes the opportunities of marketing and production alliances within beef industries. Academic research, however, has failed to provide in-depth analysis of this current trend. Industry awareness and attitudes towards forming alliances has been noted in industry surveys since the early 1990's. Only limited empirical work on the cost reduction effects of alliances has been performed (Anderson and Trapp; Den Ouden et al.).

## **2.2 Vertical Coordination Theory**

### **2.2.1 Vertical Coordination Theory -- Transaction Cost Approach**

The transaction cost approach to vertical coordination began with Coase's 1937 article regarding the nature of the firm. Coase presented costs of using the price mechanism in exchange markets. These costs included writing, executing, and enforcing contracts and were collectively termed transaction costs. Coase argued that firms were designed to minimize these transaction costs of doing business (Rehber; Boon). Williamson (1979, 1985, 1989) expanded the definition of transaction costs to include the behavioral dimensions of opportunity and bounded rationality of economic agents (Rehber), and sought to understand how vertical transactions are coordinated by differing governance structures.

Williamson's approach argues that the minimizing, or 'economizing', of transaction costs is the primary motivation for adopting different governance structures. The transaction costs approach attempts to predict the characteristics of transactions that firms could internalize at a

lower cost than relying on open-market governance (McFedtridge). The transaction cost approach is widely used as a theoretical basis to suggest motives for the various types of vertical coordination that have developed in the agri-food sector.

A characterization of a system of transactions is central to Williamson's assertion that governance structure may be understood through analysis of a firm's transactions. In general, there are three critical dimensions of every transaction: (1) uncertainty of the transaction, (2) frequency of occurrence, and (3) the level of transaction-specific investment (or asset specificity) required.

Those transactions that require an extremely high level of specific investment are termed 'idiosyncratic' transactions. One type of idiosyncratic investment is the requirement to purchase specialized capital in order to produce a particular good. For example, the buyer may convince the supplier to purchase a specialized asset for production of a uniquely designed product. After purchasing the asset, the supplier becomes locked into a relationship with the buyer. The value of producing non-specialized output would be lower than the value of producing the specialized output with the new asset for all but extreme selling prices. The buyer is also locked into a relationship with the supplier because the cost of finding the specialized output elsewhere is high since no other firm is making the needed investment in the specialized asset. The specialized asset need not be a production asset. In fact, investments in human capital may be needed for a transaction between parties, and specialized training or knowledge then facilitates the exchange relationship in a manner found nowhere else. Overall, this investment allows the two firms to proceed with contract renewals and alterations at a faster pace because they understand each other better. Idiosyncratic exchange relationships that feature personal trust will survive greater stress and display greater adaptability (Williamson, 1979).

Williamson categorized the frequency of transactions and level of specific investments into subgroups. Frequency of transactions was divided into one-time, occasional, and recurrent categories. Investments were described as non-specific, mixed, and idiosyncratic. Because one-time transactions are rarely observed, occasional and recurrent transactions were analyzed across all types of investment. Table 2.1 presents examples of all transaction types.

**Table 2.1: Williamson’s six major transaction types**

		Investment Characteristics		
		Nonspecific	Mixed	Idiosyncratic
Frequency	Occasional	Purchasing Standard Equipment	Purchasing Customized Equipment	Constructing a Plant
	Recurrent	Purchasing Standard Material	Purchasing Customized Material	Site-Specific Transfer of Intermediate Product Across Successive Stages

Williamson finds traditional open markets to be the appropriate governance structure for nonspecific transactions of both occasional and recurring frequency. With recurring transactions, both parties to a transaction only have to decide whether or not to continue their relationship. Furthermore, there is little transactional cost to switch to an alternative partner since no specific assets are required and the market is full of homogeneous, well-defined, standard suppliers. If transactions are only occasional, agents cannot rely on their personal experiences alone to guard against opportunistic behavior by partners. Alternatively, firms can rely on rating services or the personal experiences of others. In both frequency sections, market alternatives (abundance of suppliers) guard against opportunism by the counter party. Efforts to sustain a particular relationship are not made because the relation is not independently valued (Williamson, 1979).

When transactions demand mixed or idiosyncratic investments and are occasional in nature, contracting with arbitration agreements is the appropriate governance form. Both parties in this situation have strong incentives to see the contract through due to specialized investments already made. If either party reneges on the contractual agreement, the supplier would produce lower value products compared to specialized ones and the buyer would incur higher costs finding a new supplier of the specialized product. Setting up contracts to guard against opportunism in these situations is costly, and traditional market governance cannot sustain those agreements. Therefore, third-party assistance (arbitration) instead of litigation is relied on to

settle conflicts. More advanced governance in the form of agreements and coordinated efforts are too costly, since the frequency of transactions is only occasional (Williamson, 1979).

For recurring transactions demanding mixed or high levels of transaction-specific investment, partnerships/alliances and vertical integration are the appropriate governance structures. The non-standard nature of exchange means reliance on open markets is hazardous and their reoccurrence makes the investment in a more specialized governance structure worthwhile. Partnerships and alliances are examples of bilateral structures, where the identity of each firm is maintained. Vertical integration is a unified structure, where the transaction is removed from the market and organized within the firm (Williamson, 1979).

Bilateral structures are assigned where asset specialization is less than idiosyncratic, but transactions occur frequently. This type of governance may be favored over complete integration because economies of scale can be achieved through outside suppliers, or greater control over cost of supply can be accomplished. However, problems arise when the transaction must be adapted or contractual negotiations made. Since they cannot be foreseen, these adaptations must be made by mutual agreement, and therein rests the potential conflict. Both parties want to see the agreement continued when adaptations are needed because they would lose their transaction-specific investments in highly specialized capital. However, both firms want to see their individual profit streams be immune to change due to adjustment of a negotiated agreement. In order to successfully accomplish needed adaptations, the parties must have a way to identify acceptable dimensions for adjustments. These guidelines include recognizing the hazards of opportunism and how it varies by type of adjustment, restricting adjustments to where those hazards are low, and performing adjustments with an attitude that is conducive to a long-term relationship (Williamson, 1979).

As recurring transactions become more idiosyncratic, vertical coordination is more likely. Investments become more specific, and the opportunity cost of using those investments elsewhere decreases. Incentives for trading with a partner tend to decrease, and the buyer can recognize economies of size as easily as the outside supplier. At that point, the question centers on choosing the organizing mode with the best adaptive properties. With vertical integration, adaptations can be made without having to consult, mediate, or change inter-firm agreements where costs of change may be high. Price adjustment is more complete under internal

organization because ownership occurs on both sides of the transaction and joint profit maximization can be assumed. Likewise, quantity adjustments can occur at any needed frequency to maximize the joint gain of a transaction (Williamson, 1979).

Uncertainty is the final dimension of transactions that influences governance structure. Non-specific transactions have little value for continuity since new relations can easily be arranged. Uncertainty does not alter that fact, so open market exchange continues and laws govern all transactions regardless of level of uncertainty. For mixed or idiosyncratic investments, uncertainty is important because parties have a larger stake in working out mutually agreeable contract terms. As uncertainty increases, unified (vertical integration) replaces bilateral governance (partnerships/alliances) in recurrent transactions (Williamson, 1979).

Table 2.2 shows Williamson’s governance structures for each transaction type.

**Table 2.2: Williamson’s governance structure assignments**

		Investment Characteristics		
		Nonspecific	Mixed	Idiosyncratic
Frequency	Occasional	Open Markets	Contracting with Arbitration	
	Recurrent		Partnerships / Alliances	Vertical Integration

While the transaction cost approach to explaining vertical coordination has been widely used, debate has continued over whether it is the correct theoretical framework for analysis. The primary concern involves empirical support of the theory. While some empirical investigation has been undertaken, the results have been mixed because transaction costs are by nature hard to identify and measure. Works by Frank and Henderson and Hobbs claim support for transaction costs as a reason for certain vertical structures, while others such as Fahlbeck find little evidence (Boon). Other researchers have attempted to add new dimensions to Williamson’s classification (Milgrom and Roberts), critiqued oversights (Boon; Zajac and Olsen), or proposed mergers with other foundational theories (McFedtridge; Mahoney 1992a).

### **2.2.2 Vertical Coordination Theory -- Agency Theory Approach**

Agency theory is an alternative framework for use in analyzing vertical coordination governance structure and control activities. There are two main branches of agency theory: principal-agent literature (Holmstrom; Rasmusen) and positive agency theory (Jensen and Meckling; Fama and Jensen). Principal-agent theory is concerned with designing optimal contracts between two parties, with organizational form exogenous to the solution (Mahoney 1992b). The majority of principal-agent research centers on developing models under a range of quantitative variables and defining the optimum contract solutions (Sauvee). Positive agency theory focuses on organization and function of the firm, which is defined as a nexus of contracts (Jensen and Meckling). The primary function of the firm is to exploit the advantages of teamwork among its multiple agents while controlling agency costs (Ramanathan, Seth, and Thomas). Therefore, positive agency theory attempts explanation of firm coordination and function based on a range of variables that include the costs found in principal-agent literature.

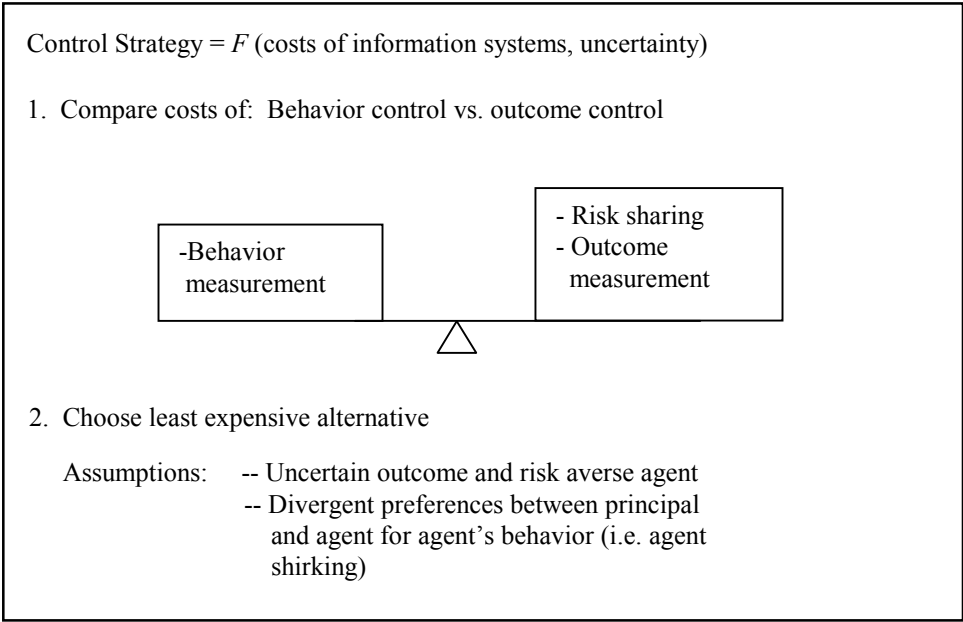
The basic principal-agent problem seeks the optimal contract (compensation scheme) which maximizes the principal's expected utility, given that (a) the agent will act in a manner to maximize their own utility given the compensation scheme; and (b) the agent is willing to accept the contract. Two main impediments to optimal contract design exist: (1) adverse selection, and (2) moral hazard. Both arise due to information asymmetries between the contracting parties. Adverse selection occurs when one party is better informed than the other about the transaction (Sauvee). For example, adverse selection would occur if a cattle feeder contracted with a packer for regular deliveries of fed cattle at specific times and knew in advance that he would most likely not be able to deliver all cattle in a timely manner. Moral hazard refers to the lack of effort, shirking, or opportunism of the agent as a result of the task not being completely observable (Sauvee). A cattle feeder not following agreed upon management specifications while feeding a client's cattle represents an example of moral hazard.

Eisenhardt depicts the principal-agent problem in terms of measurement and control over the agent's actions. Two states of nature exist: complete information, where the principal can observe the agent's behavior; and incomplete information, where the agent is aware of their own

actions, but the principal is not. In the case of complete information, a behavior-based contract is optimal because the principal is fully aware of the agent's actions. When incomplete information exists, however, the principal cannot reward the agent based on their behavior since it was unconfirmed and the agent may shirk. In this case, the agent cannot be trusted to fulfill obligational duties (Eisenhardt).

Faced with incomplete information, the principal has two primary options. The principal can make investments in behavior monitoring devices, or the principal can reward the agent based on outcomes like profitability. When rewarded on outcomes, an agent may face outcomes not completely dependent on their own efforts. For instance, the principal may be profitable despite poor performance by the agent, or be not profitable even though the agent performed very well. Where the principal faces incomplete information, control strategy of the agent becomes a function of monitoring costs and uncertainty. Figure 2.1 represents the tradeoff between the cost of measuring behavior, and the costs of measuring outcomes and transferring risk to the agent (Eisenhardt).

**Figure 2.1: Agency Theory -- Eisenhardt**



Instead of focusing on contract design between two parties, positive agency theory seeks to explain the firm and its organizational characteristics. In positive agency theory, the firm is



seen as a nexus of contracts (Jensen and Meckling). In addition, the firm is characterized by team use of inputs among agents (employees) with a centralized contractual agent (the employer), not by the presence of authority relationships (Alchian and Demsetz). Agency theory proposes that the firm comes into existence to exploit advantages of teamwork while controlling agency costs. Team production is characterized by the use of several types of resources (not all owned by one party) and a product that is greater than the sum of separable outputs of each input (Ramanathan, Seth, and Thomas). Alchian and Demsetz define team production as involving at least two inputs,  $X_i$  and  $X_j$ , where the production function is not separable into two functions each involving only  $X_i$  or only  $X_j$ . Therefore, no team production function  $Z$  exists that can be separated into individual production functions. Rather, production by a team yields a  $Z$  greater than if  $X_i$  and  $X_j$  had produced their own  $Z$  (Alchian and Demsetz).

In order to reduce shirking by agents who provide inputs for team production, monitoring costs are incurred. In particular, one person may be designated as the monitor of all agents' performance. In order to align the monitor's goals with the team's, Alchian and Demsetz propose assigning the team's net earnings to the monitor, net of payments to other input agents. In this case, the monitor of each team member's efforts has become the claimant of the residual rents created by the team. The monitor now has a lesser incentive to shirk in his duties as monitor since that will directly affect his payment stream. Team members maximize their returns by employing the monitor who reduces shirking not only by the prices he agrees to pay owners of the inputs, but also by observing and directing the actions or uses of these inputs (Alchian and Demsetz).

Positive agency theory also allows for differing ownership structures. For the classical firm, the residual claimant is defined to be one individual who bears the most uncertainty associated with the operations of the firm. The risks of most agents in the classical firm are limited because fixed payoffs are specified in their contracts. Residual risk is the risk of the stochastic cash flows minus promised payments to agents and is borne entirely by the residual claimant who is the owner of the firm (Ramanathan, Seth, and Thomas). Other governance mechanisms can be analyzed by examining the nature of residual claims and the bearing of uncertainty. Ownership of the firm may be split among individuals, where the residual claims as well as the residual risks are shared among many. Diffusion of risk among many participants

may be preferred; however, it may become inefficient for each owner to contribute management decisions. Therefore, a separation of ownership and decision-making may be sought. Ownership by many also increases the likelihood of inefficient monitoring activities. When only one residual claimant exists, all costs of shirking are borne by them. When many owners exist, the benefits from shirking are realized by the sole individual acting opportunistically, while all owners bear the cost of shirking in proportion to their ownership stake (Ramanathan, Seth, and Thomas).

The positive agency theory appears to be a useful framework for thinking about and analyzing vertical alliances. In these relatively new vertical structures, the way the alliance is organized may be as important as the relationships between and among the participants.

### **2.2.3 Vertical Coordination Theory -- Resource-Based Approach**

In the resource view, the firm's primary objective is the capture of economic rents, or above average returns (Barney). Mahoney and Pandian provide a useful classification of different rents. Owning a valuable resource that is scarce provides the firm with a Ricardian rent. Ricardian rents can take many forms including copyrights, patents, valuable locations, or natural resources (Ricardo). If barriers to entry in an industry are high, firms may capture monopoly rents as a result of government intervention or collusion (Bain). Risk-taking and innovative thinking in an uncertain environment may capture entrepreneurial or Schumpeterian rents. Finally, firm-specific rents can be captured through unique resource ownership. The differential values of first and second-best use products derived from the resource define the quasi-rent captured (Klein, Crawford, and Alchian).

According to Conner, ability to capture rents requires that (a) the firm's product is distinctive to buyers, or (b) the firm selling the same product as competitors must have a comparative advantage in its production. Therefore, the firm must somehow maintain distinctiveness of their product or a low-cost position without high levels of investments in their

resources that will defray their advantage. Because output distinctiveness depends largely on input distinctiveness, the firm seeks a unique and costly to copy portfolio of resources. These resources may include physical assets, capital goods, technology, or location. Social capital goods such as valuable networks, powerful brand names, and a solid reputation also contribute to a firm's unique resource portfolio. The uniqueness of resources allows the firm to capture sustainable competitive advantage because they are unique (Cozzarin and Westgren).

The resource-based approach differs from neoclassical theory in three important ways: (a) persistent above-average returns are possible; (b) there is no given production algorithm (firms differ in their combination of inputs and can derive rents from alternative methods of production); and (c) there may be advantages to different size and scope of firms (Conner). Therefore, the emphasis in resource-based theory is on how the firm manages to capitalize on its given resource capabilities. This capitalization is accomplished through the selection of an appropriate firm strategy. According to Cozzarin and Barry, a firm may achieve rents not because it has better resources, but because it uses resources in a more productive strategy.

The resource-based approach provides a theory of the firm that fits well inside the organizational economics literature (Barney and Ouchi). The resource-based view is aligned with agency theory because how a firm combines its resources is influenced by (minimizing) agency costs (Castanias and Helfat). Similarly, the resource-based view is linked to transaction cost theory because the firm deploys resources in a manner to minimize transaction costs. Resource-based theory seeks to advance a new theory of the firm, understand why some firms may perform differently than others in the same industry, and develop the motivations for non-traditional control structures.

Cozzarin and Westgren, Cozzarin and Barry, and Westgren all discuss manners in which resource-based theory can be expanded to encompass vertical integration and alliance formation. Westgren maintains that the resource-based approach to vertical integration emphasizes firms pooling their resource portfolios and the resulting expected rent streams. Given two firms with their own specialized asset holdings (physical, financial, human, and organizational), vertical integration will occur if returns from the newly pooled portfolio exceed returns from the separately held original portfolios (Cozzarin and Barry). Alliance formation is explained in the same manner. Rather than one firm internalizing the other because it seeks the returns from a

jointly held portfolio, both firms together may find it advantageous to combine only part of their resources and maintain their separate identities. Returns from the alliance must exceed each firm's individual returns prior to joining the alliance (Cozzarin and Barry; Westgren). By creating the jointly held portfolio, an inimitable resource is created with the ability to provide the alliance with a competitive advantage. Drawing from transaction cost logic, the high level of idiosyncratic investment resulting from pooled resources increases the cost of leaving the alliance. High costs of disassembling the alliance may provide incentives for the alliance to last (Cozzarin and Westgren).

### **2.3 Literatures on Vertical Coordination in Agriculture**

Mighell and Jones are traditionally credited with first focusing on vertical coordination within agriculture. As they saw it in 1963, agriculture was beginning to witness an economic innovation of organizational design that could impact the industry more than future technological innovations. They called the new organization methods vertical coordination, and included under that term all ways in which the vertical stages of production are controlled and directed. One of the subsets of coordination to be introduced was vertical integration, defined as the vertical structure associated with internal coordination where two or more stages of production join together in one firm.

In addition to formally introducing and defining the concepts of vertical coordination and integration, Mighell and Jones picked up where Collins ended by noting the failure of open market prices to successfully guide adjustments in production and distribution. The organizational reaction of the agricultural industry to the failure of price as a vertical coordination mechanism provided the stimulus for their research effort: the explanation of alternative coordination mechanisms (vertical integration and contracting in particular) in a broad theoretical context. Mighell and Jones asserted that there is no single simple theory for why firms integrate or coordinate via contracts, instead there are many economic and non-economic considerations to aid in explanation. Among them are reducing risk, uncertainty and costs, improving management, improving market position, gaining bargaining power, developing new technology, or obtaining financing.

Building on the seminal work by Mighell and Jones, and noting changes in consumers' demands, Barkema emphasizes the need for the food system to quickly adjust to changes in tastes and preferences. As the system becomes more responsive, traditional relationships among producers, especially how they communicate consumers' demands, must also change. Barkema argues the emergence of contracting and integration create new communication methods that increase the ability to transmit consumer demands to food producers. As a result, markets are shifting from external coordination toward vertically coordinated contracts and integration.

Boehlje and Schrader focus their efforts on the changing nature of linkages in the food chain from market to vertical coordination, the constraints on this transition, and on determining who will exert control in the coordinated system. Boehlje and Schrader emphasize that the need for more exacting quality control in specially designed products, flow scheduling and capacity utilization to control costs, reduction of price risk exposure with input and product sales, and food safety concerns will strain the ability of spot markets to coordinate the food chain. In place of open markets, other options, such as contracts, integration, or joint ventures, will be used. Therefore, they reason that relationships between input suppliers, producers, and processors will become more personal than in an open market atmosphere.

While they expect to see increased use of contracts, Boehlje and Schrader present some constraints to increased contract and vertical coordination. Where more variation in inputs is tolerable, buyers will continue to source their needed attributes by sorting through the available commodity product. In addition, there may be high transaction costs associated with coordination that exceed the benefits of that coordination. Inability to agree on contract terms, inaccurate transfer pricing between divisions of a company or alliance, and disagreement on proper sharing of risks and rewards between partners all increase transaction costs.

Boehlje and Schrader also discuss the control of coordinated systems. Specifically, they question who will determine the performance of a system and the sharing of risks and rewards in a system that has traditionally seen power exerted by those firms with large size and ability to act monopolistically. They argue that there are two fundamental control points in the coordinated system: end users and firms that have intimate contact with consumers, and raw material suppliers whose offerings cannot be easily substituted (e.g. owners of genetics). These control points have knowledge of consumer wants, needs, and purchasing power, in addition to know-

how of the needed basic raw material to provide the consumer's desired product. The source of power is therefore knowledge, not size. Knowledge of consumers and how to manipulate genetic material to produce specific products will be the basis for system power and control. Firms at these two control points will be able to extract larger rewards and transfer risk to other participants in the system. Emphatically, Boehlje and Schrader argue that the most power and control can be exerted by those parties that know the consumer best.

Barry, Sonka, and Lajili recognize the theoretical developments in vertical coordination, and review the economic organization and financial structure of agricultural firms with respect to transaction costs, agency relationships, and contracting. In contrast to traditional analysis of firms integrating and seeking to capture monopolistic rents, the research focus now must center on agency relationships, contracting, transactions costs, the boundaries of a firm, and the linkages between vertical coordination and a firm's financial structure.

Agency relationships are central to understanding today's agricultural firm. As vertical linkages expand between participants in the food industry, firms will seek to keep agency costs of doing business low in order to ensure continued success. These agency costs will be incurred while each firm attempts to structure, administer, and enforce contracts that closely align the interests of both principal and agent (Barry, Sonka, and Lajili).

Barry, Sonka, and Lajili also argue that transaction costs must be considered when discussing the motivations for increased vertical coordination. Specifically, as firms invest in more specific assets to produce more specialized products, they will incur greater opportunity costs if there is a need to use those assets elsewhere. Increased transaction costs thereby create a greater tendency towards more long-term contracting and vertical integration. The boundary of the firm becomes important in vertical coordination research due to its effects on rent allocation. Barry, Sonka, and Lajili argue that asset control as defined by Hart is an important management decision because holding residual rights of control to assets will determine relative bargaining position in negotiations, as well as the allocation of ex-post quasi rents.

Barry, Sonka, and Lajili also propose that financing arrangements may impact the choice of governance structure by the agricultural firm. Financing through a contractor may sustain a relationship between producer and contractor, or even help to expedite incentive alignments between the parties. Credit through a contractor may decrease the market access risk faced by

producers, meanwhile enhancing the producers' credit worthiness to potential outside lenders. Barry, Sonka, and Lajili emphasize that agricultural economists must begin to analyze the performance characteristics of alternative contractual arrangements among producers, agribusinesses, and creditors. Advances in theoretical frameworks involving agency relationships, transaction costs, and financing provide some of the tools vertical coordination researchers can use.

Knoeber provides an example of Barry, Sonka, and Lajili's call for framing discussions of vertical coordination in a theoretical context. Noting the absence of spot markets in the poultry industry, Knoeber uses transaction cost logic to reason why broiler production is characterized by contracts. To control opportunistic behavior and ensure continued performance in the exchange relationship, either contracts or vertical integration will be used to organize production. However, transaction cost theory also asserts that as uncertainty increases, contracts must become more complex or less complete, ultimately advancing towards complete vertical integration. Here, Knoeber seeks to understand why broiler production still uses contracts, rather than vertically integrated company farms, in an industry characterized by rapid technological change and production uncertainty.

Knoeber finds that by compensating growers through a tournament style system where their performance is rewarded relative to their peer's performance, the cost of contracting to the integrator is decreased substantially. Since contract growers must provide large amounts of capital in the form of chicken houses, their performance is automatically bonded. The relationship becomes long-term, and self-selection by high-quality growers occurs. In fact, Knoeber found that hired managers of a company owned broiler production unit performed less well than contract growers.

Vukina and Foster frame broiler contracts in a standard principal-agent context. They cite critiques of contracts by growers as a chance to apply principal-agent theory in redesigning contracts to better align incentives and to capture efficiency gains. In theory, the broiler contract is designed to provide growers incentives to manage the poultry farm in a manner that maximizes returns to the integrator. When neither grower nor integrator is maximizing their returns, redesigning contracts to better align incentives should result in gains of welfare and efficiency. Vukina and Foster model the grower's decision-making process and observe how it changes with

alterations in the contract design. Simulations over three contract parameters (base payment, bonus factor, and utilities cost allocation) indicates that switching part of the utilities cost from grower to settlement cost holds promise for increasing welfare levels of both producer and integrator.

## **2.4 Strategic Management Literatures on Alliances**

Outside of traditional agricultural research, the strategic management literature offers information on strategic alliances. While most of the information available is qualitative in nature, the discussion provides useful starting points for understanding how to define alliances and understand the critical dimensions of alliance formation and function.

Koenig and van Wijk provide a working definition of alliances. They note that the term “alliance” has been used to describe diverse organizational arrangements including:

- Informal, inter-firm arrangements such as understanding “normal” market share and competitive pricing;
- Formal inter-firm deals including contracts;
- Joint-ventures where cooperating firms have formal stakes in the independent operation; and
- Partnerships involving research or manufacturer-distributor relationships.

Regardless of label, each arrangement shares common characteristics:

- Firms keep their formal identities even if they sacrifice some autonomy;
- Collaboration between firms involves transfer or sharing of tangible or intangible goods or assets;
- Incomplete information exists on the value of what is transferred between partners; and
- Control over the object of cooperation may be delegated.

Building on these common characteristics, Koenig and van Wijk define an alliance as independent firms cooperating with little or no “hard” control, sharing assets in order to achieve a mutually beneficial outcome. Without “hard” control, formal ownership or binding



agreements, an alliance more nearly resembles a willful cooperation than a basic formal agreement.

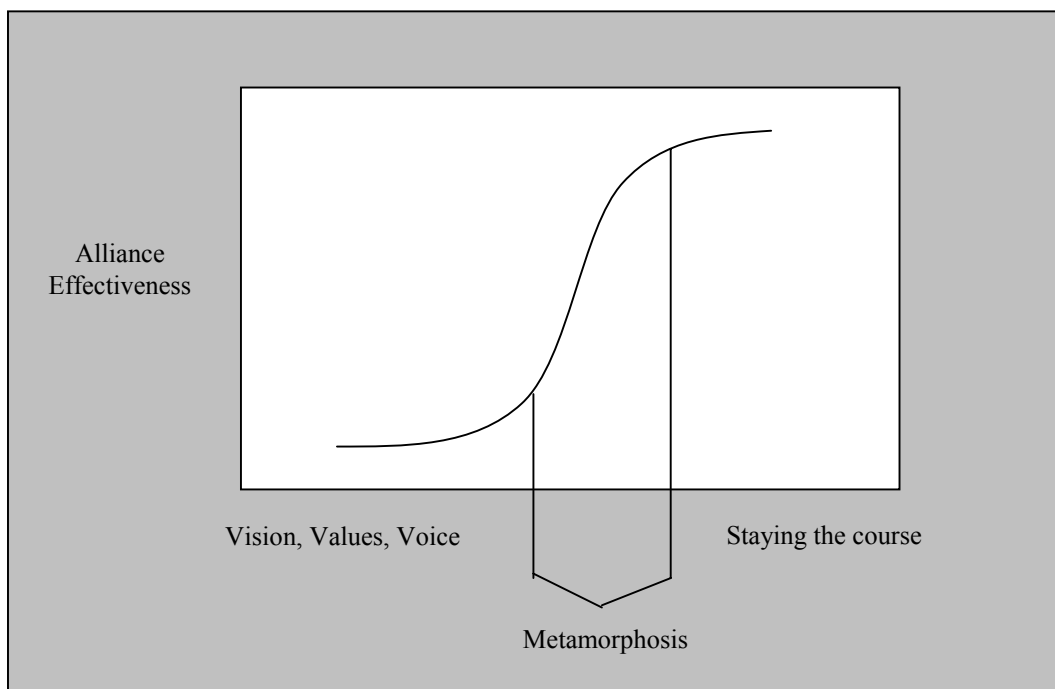
Stafford places strategic alliances in the middle of a continuum ranging from infrequent 'arms length' transactions to fully integrated relationships involving mergers and acquisitions. Stafford presents three basic relationship types that can tie partners closely together for a long time: contracts, creative joint ventures, and acquisitive joint ventures. Contracts are non-equity agreements describing the contributions and powers of each partner. The non-equity nature of contracts causes investment into the alliance to be less. Partners have greater autonomous decision-making power, and the alliance is easier to break up if it fails to achieve stated objectives. Creative joint ventures involve the combination of resources by partners to create a separate subsidiary jointly owned by the partners. The creative joint venture requires substantial capital and resource investment from partners, and is subsequently harder to dissolve. Further, partners in a creative joint venture must make significant time and effort investments in negotiating resource, management, and technology control. Acquisitive joint ventures exchange equity between partners, but no separate entity is created. Instead, one partner acquires partial interest in the other, and they work together with joint management and assets. Under the acquisitive joint venture, much closer coordination is needed. One partner may have significant bargaining power over the other as a result of acquisition, and threaten their autonomy if objectives cannot be met.

Spekman, Isabella, MacAvoy, and Forbes describe a life cycle of alliances. Under their characterization, alliances exhibit three stages of growth: formation, metamorphosis, and managing over time. Figure 2.2 presents all three stages of alliance growth.

The formation stage of an alliance is comprised of vision, values, and voice. Initially, a shared vision for what can be accomplished becomes shared between two firms, leading to a set of common values. Voice is a necessity for these values of corporate culture and strategy to be understood, and the shared vision to be realized. Metamorphosis leads the two firms from vision to viability. Specifically, coordination occurs first as both firms develop the administrative infrastructure that will govern the alliance. The alliance then takes an operational approach as coordination committees are formed to oversee joint decision making processes, add stability to the relationship, and encourage the building of trust between the partners. As metamorphosis

continues, investment by partner firms in the financial, human, physical, and intellectual capital of the alliance signifies their dedication. Management over time includes stabilizing the alliance, establishing a review process, and going through a decision stage that signals an important juncture in the alliance's life. The review process is designed to make changes in alliance function, but only selectively, avoiding so much review that becoming dysfunctional is possible. Finally, alliances must make decisions ranging from continuation of the alliance to broadening or narrowing the alliance's scope.

**Figure 2.2: The Alliance Life Cycle**



Das and Teng contribute to the understanding of alliances by exploring risk. Relational risk involves alliance partners not fully committing themselves to the alliance purpose. Performance risk is caused by market factors outside of the partners' control. The presence of relational risk makes the inter-firm alliance unique. All other strategic plans not involving cooperation are exposed only to performance risk. Das and Teng examine how the level of relational and performance risk affect alliance partner behavior and the choice of equity or non-equity structure.

Das and Teng propose that relational risk perception by an alliance partner will be increased by believed pay off inequities and higher levels of difficulty in protecting one's proprietary knowledge. Relational risk perception will be lower the greater the number of previous alliances between the partners. Performance risk is inherently higher for alliances creating and marketing new products and technologies, establishing an international presence, or alliances characterized by highly specific or idiosyncratic investments where the cost may be non-recoverable. Regarding alliance structure, Das and Teng find that inter-firm alliances are likely to be equity based under high levels of relational risk, and non-equity based under high levels of performance risk. Equity alliances allow for a control on potentially opportunistic behavior by partners, while non-equity structures allow for quicker dissolution if the alliance fares poorly.

Koenig and van Wijk stress the importance trust plays in the emergence and performance of alliances. Trust is a key component for emergence of an alliance because it reduces uncertainty about a potential partner's actions. In short, trust supplements formal contract agreements while allowing the needed flexibility for adjustments. As an alliance grows, trust is gradually replaced by administrative fiat and formal rules. Trust without formalization leads to unstable situations where the potential cost of opportunistic behavior by partners is high. Therefore, successful alliances need trust to grow and develop optimally, but that trust must be eventually replaced by formal controls over time to avoid potentially destructive situations.

Stafford identifies partner selection as important when uncertainty is high and the alliance will involve complex forms of coordination. In particular, a firm should evaluate the strategic goals, resources, and culture of each potential partner before committing to a cooperative relationship. Shared vision of alliance objectives is essential for success. If partners do not act in expected ways to unforeseen circumstances, mutual trust may be harmed. Strategic goals that are compatible also foster a sense of cooperative spirit that builds mutual trust between firms.

Resources are important to evaluate for appropriateness of alliance objectives. For instance, partners should have complementary resources for sequential value creation activities, and comparable resources for pooling activities. Contributed resources should also reflect an approximately equal level of dependence to provide incentives for long-term cooperation. If one firm becomes dependent on the other's resources, it may become burdensome to the other.

Ultimately, partner resources should match needs to accomplish alliance objectives and be equitable in terms of shared contribution.

Finally, a firm should evaluate a potential partner's corporate culture. If the two cultures are incompatible, expectations and trust between partner employees can suffer and conflict may result. While it is possible for two cultures to form their own hybrid culture in an alliance setting, Stafford emphasizes it is highly unlikely unless significant amounts of time and resources are committed to the task. Choosing the right partner is thus a key component of successful alliance building. Stafford emphasizes that successful strategic alliances are a result of careful design, not repair.

Spekman, Isabella, MacAvoy, and Forbes view the alliance manager as the essential ingredient to alliance success. The alliance manager is responsible for guiding the alliance through each stage of its life cycle, sometimes requiring different roles at different times. Spekman et al. insist that the manager must be a sponsor and outright advocate of the vision for the alliance in order to foster cooperation among inter-firm managers and employees. In addition, the manager must be able to mediate conflicts between partners, balancing the needs and concerns of both parties. Foremost, the manager must be adept in management skills. Without skilled knowledge, alliance managers cannot ensure that the alliance will maintain course and achieve its goals and objectives. Fortunately, Spekman et al. believe that certain competencies can be taught to potentially strong alliance manager candidates. However, it is important to ensure the proper set of work and educational experiences for potential alliance managers to develop adequately. Spekman et al. emphasize that alliances are 'unnatural' organizational forms requiring special care and that it is unwise to place key alliances in inexperienced hands.

## **2.5 Agricultural Economics Literature on Strategic Alliances**

Despite many calls for research on organizational forms falling between traditional open markets and complete vertical integration, limited agricultural economics literature exists. The small number of pieces dealing with 'alliances' or similar organizations has been mostly qualitative in nature. Researchers have moved towards defining alliances, provided reasons for

their existence along the agricultural production/marketing chain, and extracted from strategic management literature information on choosing partner firms. Only one conceptual model has been advanced of an alliance relationship, a model Cozzarin and Barry outlined for a representative three firm pork production alliance in 1998.

Sonka emphasizes that the exact form and nature of strategic alliances is difficult to define due to their varied and evolving nature. Unique to most alliances is the presence of bilateral negotiation as a way to allocate resources and govern exchange. While contracts often formalize agreements, written and legally enforceable contracts are not always present (Sonka). Van Duren, Howard, and McKay argue that a successful strategic alliance is characterized by partners that share the goal of achieving that relationship, the desire to achieve it, and an understanding of the processes required to achieve it.

In 1992, Sporleder noted that strategic alliances were becoming more common in agricultural commodity marketing channels. As a possible reason, Sporleder cited that managers may be discouraged from complete vertical integration by the high levels of idiosyncratic investment resulting from asset specificity. By using transaction cost logic, Sporleder asserts that alliances offer managers the opportunity of vertically optimizing among control, bounded rationality, and idiosyncratic investment (1992).

Sporleder's features of alliances include mutual obligation through asset specificity. While most alliance arrangements allow for flexibility in the original objectives, partners tend to still be committed to original goals. This sustainable feature is brought about by mutual asset specificity of partners, who would realize a high opportunity cost if they abdicated from the alliance (Koenig and van Wijk). In 1994, Sporleder classified these highly specific assets held by partners in alliances as 'hostage assets.' Hostage assets are the stream of quasi-rents associated with specific investments by partners, and sustain an alliance relationship by increasing the opportunity cost of a non-successful agreement (Sporleder 1994).

Den Ouden et al. believe that specific market and production characteristics of agricultural food chains provide additional motives for alliance formation. These characteristics include:

- Perishability of many products;

- Variability of quality and quantity of supply of farm-based inputs due to biological variation, seasonality, random factors connected with weather, pests, or other biological hazards;
- Difference in lead time between successive stages;
- Complementarities of agricultural inputs, meaning that they are available in joint packages only;
- Stabilization of consumption of many agricultural products;
- Increased consumer attention concerning both product and method of production;
- The fact that the internal quality of the raw material is the highest quality attainable for fresh products such as meat; and
- The need and availability of capital, especially at the primary farm stages.

The perishability of fresh produce increases the demand for timely marketing outlets, especially in the face of limited storage availability. Therefore, assured market access is imperative to suppliers of perishable products. The existence of capital intensive production facilities make coordinated and continuous supply inputs necessary to recover costs. Differences in lead-time between stages require efforts to match these to each other (Den Ouden et al.; Ziggers). Indeed, agricultural industries provide their own unique incentives for alliance formation.

In an effort to strengthen newly forming agricultural alliances, both Winter and Ziggers provide guidance on creating successful partnerships. Winter presents a new way to view partners within a supply chain alliance -- as customers. In most supply chains, each successive stage takes the skills and inputs of the previous supplier and reassembles or otherwise adds value to pass on to the next stage, ultimately the final consumer. Therefore, the long-term viability of the alliance depends on the long-term customer satisfaction of the next production level. For beef alliances, the feeder-packer partnership will only last as long as the packer (the feeder's customer) is satisfied with the feeder's output. Likewise, long-term success will depend on the feeder (the packer's customer) being satisfied with the packer's payment and risk-sharing performance.

The ability to satisfy partners in an alliance will depend in large part on making sure the risks and rewards are present for all partners to have an incentive to make the partnership work. Each partnership must pursue mature, long-term thinking about profit sharing, especially if

partners are asked to share in risk exposure. When the profit sharing is on a long-term basis, a partner's loyalty to serve and drive the overall alliance will be significant (Winter). Partners must expect a change in the level of control as well. Conflict may result if a partner performing functions for the alliance behaves in an opportunistic manner, so safeguards in the management of the alliance should be established to minimize the incentive to shirk. Winter argues that the most successful partnerships will be those that permit each firm to jointly determine a strategy that: (1) fits the environment and needs of the consumer; (2) requires each firm's distinctive competence; and (3) generates actions each firm would be unable to do on its own accord.

Ziggers identifies four primary factors exist to create successful alliance partnerships: (1) clear benefits for all partners; (2) a good strategic fit of partners; (3) the involvement of all management levels; and (4) organizational flexibility.

Cozzarin and Barry provide the only known conceptual model for an alliance relationship, a three firm swine production alliance. Their goal in the research was to understand and compare the performance characteristics of different organizational structures in the hog industry. Since contracts are proprietary, empirical information is scarce, and conceptual models offer the alternative method for researching these organizations. Cozzarin and Barry found that the integrator organizational form (one party as sole residual claimant) might be preferable to an alliance. The reason is that the integrator pays the managers less than alliance partners would likely demand, and therefore achieves a higher net return on his effort. The integrator also has a higher incentive to reduce transaction costs because it is the sole residual claimant. Cost saving could have occurred in the alliance being examined, but the derived benefit would have to be split three ways.

## **2.6 Literatures on Beef Alliances**

Research on beef alliances can be divided into four pieces: (1) Schroeder et al.'s comments on the emergence and industry perception of beef alliances; (2) Ward, Fuez, and Schroeder's analysis of pricing grids, a common feature of most value-based marketing alliances; (3) Anderson and Trapp's empirical measurement of the value of non-price means of coordination between cattle feeder and packer; and (4) Weimar and Hallam's analysis of risk and

risk sharing between cattle owners and feedlot operators under alternative custom feeding contracts.

The first arrangements between feeders and packers were collectively called marketing agreements. Later on, the terms strategic alliances, alliances, and partnerships became popular and the pricing mechanism in marketing agreements was termed formula pricing or grid pricing. As a result of the strategic alliance project managed by the National Cattleman's Association (National Cattleman's Association 1993), the terms strategic alliances and alliances became more widely used (Schroeder et al. 1998). Sartwelle categorized the alliances into four types: (1) breed association-sponsored carcass alliances, such as Certified Angus Beef; (2) commercial beef carcass alliances, such as Farmland Supreme Beef Alliance; (3) natural/implant-free carcass alliances, such as Coleman's Natural Meats; and (4) other vertically oriented cattle and beef marketing programs, such as U.S. Premium Beef.

Schroeder et al. present the main incentives for the formation of exclusive marketing agreements or alliances (1998). Nearly every incentive relates to the movement towards value based pricing:

- Improving the price signaling function between stages of production, processing, and distribution;
- Eliminating problems with pricing on averages; and
- Reducing the adversarial relationship between feeders and packers.

Overall, these incentives are aimed at improving the beef price discovery process.

By pricing fed cattle on carcass characteristics, alliances seek to improve overall cattle quality by rewarding better cattle and penalizing poorer cattle. Packers return slaughter summaries and other carcass performance data to producers and feeders to provide information on how their cattle performed. This information allows for adjustment to genetics and/or management to maximize future returns. The information provided by the alliance is not usually available to producers in cash market transactions where price is determined on a live-weight basis. Marketing agreements and alliances also eliminate the risk of pricing cattle on a specific day, possibly a thinly traded day with high price variation. Alliances also ensure market access to producers concerned with captive supplies of packers, with some even allowing for feeder



determined delivery scheduling that improves fed cattle performance on the grid (Schroeder et al. 1998).

Schroeder et al. also relay industry perceptions of alliance organizations and their future in the beef sector. Nearly all packers and most feeders expect alliances and grid pricing to increase in the future, expanding to about 30% of fed cattle slaughter. Reasons cited for the increase include a better relationship between feeders and packers, clarification of the signals needed to be sent from retail to packer to feeder to cow-calf to the genetics provider, and shared information that allows for all partners to understand value and make changes to increase it.

Industry participants did have some problems with alliance structures, however. First, cattle marketed through alliances bypass traditional live weight marketing and price reporting stages, thereby becoming ‘captive supply cattle.’ Some cattle producers feel that increasing levels of captive supplies will result in packers becoming less aggressive for non-alliance cattle, adjusting their bid prices downward. Other producers and cattle feeders have concerns with the base price used in a grid or formula price to determine fed cattle value. They believe that if only high quality cattle are marketed through alliances, poorer quality cattle may be forming the base price to determine the value of these higher quality cattle. Overall, industry caveats about the emergence of alliances were minor, with most packers, cattle feeders and producers expecting alliances and grid pricing to increase (Schroeder et al. 1998).

For the vast majority of beef alliances, pricing via grids and/or formulas have become the most common method of determining cattle value. Ward, Fuez, and Schroeder provide the most in-depth analysis of formula pricing and grid pricing of fed cattle to date. The authors emphasize that grid pricing sends clearer price signals and improves beef market coordination relative to traditional marketing methods. Average live weight or dressed weight pricing methods fail to identify and price the value difference between high and low quality cattle, resulting in a pricing error estimated to be \$30/head or more. Alliances that utilize grid pricing allow for producers to capture premiums associated with higher quality cattle, increasing revenues as much as \$35/head.

Ward, Fuez, and Schroeder also note, however, that grid pricing has important characteristics of which producers should be fully aware. First, base prices used in the calculation of cattle prices are important. Extreme variance in, or the incorrect choice of, a base price to use within a grid pricing system may send the wrong signals to producers or not reflect

current market conditions. Second, along with premiums, producers should understand the full effect of discounts within the grid as well. In some instances, discounts for a few poorer quality cattle can more than offset the premiums from a larger number of higher quality animals. Third, producers must understand that grid prices vary significantly more than live weight or dressed weight prices. The authors' research indicated that grid prices frequently vary by \$2-6/dressed cwt. or \$15-45/head. The grid price variation will inevitably lead to higher producer revenue variation. In conclusion, Ward, Fuez, and Schroeder emphasize that grid pricing, when used correctly, is a step towards value-based pricing. Simply targeting a given group of cattle to the best grid, however, does not induce the type of changes in genetics and breeding needed to move the beef industry forward. "Only when genetic and management changes result from grid pricing information can long-term value-based marketing be achieved (Ward, Fuez, Schroeder, 1999, p. 55)."

Citing Den Ouden et al., Anderson and Trapp noted the absence of quantitative literature available on vertical coordination's effects on either an entire production chain or an individual stage of that chain. Therefore, Anderson and Trapp set out to empirically estimate the value of coordinated marketing/purchasing between cattle feeders and meatpackers. They found that packers could realize substantial cost savings by reducing the variation of fed cattle supply into their plants, allowing large plants to run near full utilization. Steady daily flow of cattle into their plants near optimal processing capacity could save packers \$2-5/head. Packers could also realize \$1/head savings if they removed the 15% variation in daily slaughter rates that are now normal. Anderson and Trapp found that feedlots could realize higher profits by coordinating sales of cattle within an optimal 2-week time period. Selling cattle within one week of optimal sales time can increase profits for feeders by \$2-5/head. Selling cattle one week before optimal time can result in \$2/head profit reduction, while selling one week after optimal time can cost \$6/head in reduced profits.

Anderson and Trapp note that feeders generally prefer marketing strategies where they "keep their showlist current" by selling cattle early in the optimal window to capture the highest feed efficiency and allow lower total pounds on the market. Packers tend to prefer strategies that "back cattle up" and generate a steady volume of relatively heavy cattle, increasing their ability to operate at their optimal processing volumes. As expected, the packer's strategy resulted in the

lowest processing costs per head, but increased feedlots' cost of gain by \$25/head. The feeder's preferred strategy had the lowest cost of gain and the least price discounts, but raised processing costs \$2/head. Neither the feeder nor the packer preferred strategy resulted in the highest possible total industry profit. Under coordinated efforts between feeder and packer, however, the optimal strategy for the industry produced \$37/head of added profit. Through coordination, packers would receive their optimal weights whenever possible, but cattle were never sold above the feedlot's optimal selling weight. Coordination anticipated supply gluts and sold cattle early at lighter-than-optimal weights when needed.

Anderson and Trapp emphasize that in reality, it would be nearly impossible to find replication of \$37/head profits due to real-world situations and administrative costs. In addition, realizing those high profits would involve unprecedented levels of cooperation. The reason for this is that coordination strategies that raise industry-level profits are not cost minimizing to packers. However, the authors believe that there is room to add \$5-15/head of industry-wide profit through the use of non-price coordination. Gains in industry-level profits more than outweigh increased costs for packers. Therefore, a redistribution of profits could adequately compensate packers for their higher costs and all participants in the industry could benefit from higher profit levels than under non-coordinated strategies. Anderson and Trapp emphasize the need for research on how savings associated with coordination can or will be shared between cattle feeders, producers, and packers.

Weimar and Hallam provide the beef alliance literature with research on optimal contract design in custom cattle feeding operations. In particular, their research analyzes the risk and returns associated with three types of custom cattle feeding contracts: yardage fee contract, yardage fee plus feed markup contract, and the guaranteed cost-of-gain contract. Weimar and Hallam's research adds information on two main points: that risk and return levels may in fact be stochastic in nature requiring contract redesign; and that possibilities exist for contracts that significantly reduce risk for one party while only slightly increasing the risk faced by the other party. As alliances seek to use contracts among partners, Weimar and Hallam's work can help outline the method for assessing risk faced by each party and methods for managing it.

The first contract analyzed by Weimar and Hallam is the yardage fee contract. The yardage fee contract transfers price and performance risk from the feedlot operator to the cattle

owner. The fee is based on a constant per diem charge, in addition to charges for amount of feed consumed. Under this contract, the cattle owner assumes the risk of changing cattle prices, changing feed prices, and variable performance of the cattle. The yardage fee plus markup contract is the same as the yardage fee contract, but includes a percentage markup on feed costs. The guaranteed cost-of-gain contract requires that the feedlot owner provide all inputs, except the feeder animal, in return for a guaranteed payment per pound. This contract's risks are primarily determined by animal performance. If cattle have poor feed conversion and take longer to finish, the feedlot operator assumes the risk that the per pound payments may not be enough to cover all costs.

What sets these various contracts apart is their relative distribution of risks. The guaranteed cost-of-gain contract transfers all performance risk to the feedlot operator, while the yardage fee contracts transfers almost all risk to the cattle owner. For risk averse cattle owners, the guaranteed cost-of-gain contract would be preferred while feedlot operators likely would prefer yardage fee contracts (Weimar and Hallam).

Weimar and Hallam find that a feedlot operator takes on considerably more risk with a guaranteed cost-of-gain contract than with a yardage fee contract. In fact, feedlot owners are significantly better off with a yardage fee contract in terms of return variance. Cattle owners, however, do not fare significantly better when they have shifted all risk to the feedlot operator. Instead, cattle owners are only slightly better off with guaranteed cost-of-gain contracts. In addition, Weimar and Hallam found that risks varied significantly with the seasons for feedlot operators in the Midwest. Citing the variation, Weimar and Hallam suggest that contracts may need to be modified accordingly throughout the year according to feeding season. Finally, much more work needs to be done in this area to determine performance characteristics of alternative contract designs.

## **2.7 Summary**

Alliances are only one relatively new type of vertical coordination, and as such they are generally overlooked by researchers who focus on contracting or vertical integration. Hence, most research loosely applies findings from integration and contracting problems to all forms of

vertical coordination. Because alliances are a blend between sovereign firms interacting within a traditional open market setting and a vertically integrated system, no single theory completely explains alliances. Instead, all three approaches to explaining vertical coordination can be used in building a conceptual framework for understanding why alliances are formed and the ramifications of alternative design choices.

Transaction cost theory argues that minimizing transaction costs is the primary motivation for adopting alternative organizational designs like alliances. According to the transaction cost approach, the emergence of alliances within the beef sector may be partially explained by high levels of transaction specific investment between participants and the recurring nature of their transactions. Examples include:

- Investment in genetics by calf producers in order to participate in certain branded beef programs;
- Feedyards investing in scanning equipment to identify animal-specific optimal slaughter dates;
- Packing firms making enormous investments in large plants that must run at or near full capacity to avoid production cost increases;
- Packers requiring specific types of cattle to fulfill investments in branded quality product lines; and
- Additional investments by participants in individual animal identification, communication capabilities, relationships, and trust to achieve the desired product.

Resource-based theory also lends itself to explaining why the beef industry is witnessing a growth of alliance organizations. In an attempt to meet consumer demands and improve the beef offering, industry participants have realized the need to coordinate effectively the efforts of all levels of production. This coordination can be seen as the creation of a unique resource portfolio, giving an alliance or “team” a competitive advantage in the search for more of the consumer’s spending dollar.

Agency theory answers “how” alliances can be set up to accomplish the objectives set forth by all other theories of the firm. Positive agency theory focuses on designing the firm or alliance to maximize advantages of teamwork while controlling all agency costs. Principal agent theory can be employed to minimize those agency costs through optimal contract design.

Designing contracts that allocate risk effectively, creating the optimal compensation design, and aligning otherwise divergent preferences for behavior are a necessity for alliances to prosper in the future.

It is clear that more work needs to be done on beef alliances, with most research historically focusing on vertical integration or contracting. Anderson and Trapp have provided empirical evidence showing large economic incentives do exist for beef system coordination. Ward, Feuz, and Schroeder have analyzed the effects of grid and formula pricing on users, a common choice for pricing mechanisms in beef alliances. This research continues the search for information on alliance function and on the consequences of alternative design choices.