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## **2 Toward an Institutional Analysis of Vertical Coordination in Agribusiness**

*LOÏC SAUVÉE*

Vertical coordination<sup>2</sup> has always been a major field of economic research, both theoretical and empirical. Industrial organization theory has focused on vertical integration and make-or-buy decisions and is mainly built on a technological and imperfect competition basis. The transaction cost theory has developed a contractual vision of firms and markets and has opened new perspectives for the study of vertical coordination. Complementary and sometimes critical researchers from the fields of agency theory, strategic management, and organization theory have pushed further and extended the Williamsonian paradigm and some industrial organization insights.

We will see that the field of New Institutional Economics could provide renewed theoretical foundations on which to base understanding and analysis of the complex and polymorphic phenomenon of relationships between firms. In the same vein, integrative approaches implementing strategic dimensions and organizational economics appear to be a promising way of research. Our objective is to show that these recent contributions can lead to new perspectives on vertical coordination, seen as a result of strategic planning choices. Consequently, the purpose of the analysis is to understand how the decisions are made and to propose a framework for firms' decision making.

The paper is divided in three parts. The first part is mainly a review of the literature on institutional approaches to vertical coordination. It explains the concepts, from the most significant works, used in the study of vertical coordination between firms. Indeed, each theory focuses on certain aspects of the phenomenon in order to represent it in an intelligible way and in a specific perspective. The emphasis is put on recent syncretic institutional and strategy-oriented theories,

methodological contributions. The vertical chain structure of agricultural subsectors, the heterogeneity of their vertical coordination mechanisms, and the importance of quality and chain management issues have interested many agricultural economists in applying or testing theoretical hypotheses. Consequently, we attempt to determine a possible methodological framework for the study of vertical coordination in agribusiness, with an illustration applied to the alternative business linkages of the broiler industry.

### **Institutional Analysis: Main Theoretical Backgrounds**

*Transaction Cost Economics and Related Approaches*

*The governance structures of vertical transactions*

Instead of studying the firm as an entity, Williamson (1979, 1985, 1989) considers the transaction as the basic unit of analysis. Under behavioral assumptions of opportunity and bounded rationality of economic agents, this theory affirms that "institutions of economic organization have a transaction-cost origin" (Williamson 1979), where the transaction costs are the costs of carrying out transactions.

The central hypothesis of Williamson's work is that "transactions, which differ in their attributes, are assigned to governance structures, which differ in their costs and competencies, in a discriminating—mainly transaction cost economizing—way" (Williamson 1979). Therefore, knowing the significant dimensions of transactions will allow one to predict governance structures. According to Williamson, the critical dimensions of transactions are the frequency with which they recur, the degree and type of uncertainty to which they are subject, and the condition of asset specificity.

Four generic governance structures and three contracting forms are considered: market (classical contracting), trilateral (neoclassical contracting), bilateral and unified (relational contracting) (Table 2.1).

The market governance structure is the main structure for "non specific transactions of both occasional and recurrent contracting" (Williamson 1989). In these particular types of transactions, markets are seen to be efficient and the specific identity of the parties is unimportant.

Trilateral governance involves two types of transactions: occasional frequency of both mixed and idiosyncratic assets. In these cases, "the interests of the principals in sustaining the relation are especially great" (Williamson 1979). Then, "given the limits of classical contract law (the market governance) for sustaining these transactions and the prohibitive costs of transaction-specific governance, an intermediate institutional form is needed" (Williamson 1979). A third-party assistance will resolve disputes and evaluate performance.

The bilateral and unified governance structures are both considered to be relational contracting forms. They occur when transactions are recurrent and involve mixed or idiosyncratic assets. Williamson distinguishes between the case in which the autonomy of the parties is maintained (bilateral governance) and that in which the transaction is organized within the firm (unified governance or vertical integration). Bilateral governance occurs in the case of mixed assets and recurrent transactions; both parties have a strong incentive to sustain the relationship. Unified governance is required when transaction-specific assets become more idiosyncratic and therefore when incentives for trading weaken. A complete vertical integration allows adaptations without the need to "consult, complete or revise interfirm agreements" (Williamson 1979).

In the transaction cost theory, each type of vertical governance structure will stem from the characteristics of transactions. Under the assumption of economic efficiency and competition, the chosen governance structure will minimize the total transaction costs.

According to Milgrom and Roberts, it is useful to separate the transaction costs into two categories: coordination costs and motivation costs. The coordination costs are the costs of "monitoring the environment, planning and bargaining to decide what needs to be done" (precontractual costs). The motivation costs are the costs of "measuring performance, providing incentives, and enforcing agreements to ensure that people follow instructions, honor commitments, and keep agreements" (postcontractual costs).

In a complementary work, Williamson (1991) notes the dimension of governance structures related to adaptation to economic changes, which, according to him, is the source of organizational dynamics. He considers two types of adaptation:

1. Adaptation type A (autonomy) in which "consumers and producers respond independently to parametric price changes so as to maximize their utility and profits, respectively."
2. Adaptation type C (cooperation) wherein "the needs for coordinated investments and for uncontested (or less contested) coordinated realignments increase in frequency and consequentiality" (Williamson 1991).

Governance structures will vary in their efficiency to adapt to economic changes (type A or type C) because they rely on instruments of control with variable incentive intensity. Market governance structure is particularly efficient in adaptation A, while hierarchy is better to orchestrate coordinated actions in adaptation C. Table 2.2 gives the main distinguishing attributes of three generic forms of governance structure: market, hybrid, and hierarchy. The choice of a governance structure is not only linked to characteristics of transactions, but also to external conditions.

Transaction cost theory gives a contractual representation of vertical coordination. The central notion of governance structure is the ability to join economic and legal aspects. But, taking into account many criticisms and being aware of the limitations of his own framework, Williamson (1993b, 1994b) progressively broadened the scope of transaction cost theory to a more general theory of economic organizations. Indeed, his concept of market or organization failures as the only determinant of vertical integration decisions is probably too restrictive.

**Table 2.1 Characteristics of transactions and governance structure**

Frequency	Nonspecific	Mixed	Idiosyncratic
Occasional	Market governance (Classical contracting)	Trilateral governance (Neoclassical contracting)	Trilateral governance (Neoclassical contracting)
Recurrent	Market governance (Classical contracting)	Bilateral governance (Relational contracting)	Unified governance (Relational contracting)

Source: Williamson (1979).

**Table 2.2 Distinguishing attributes of market, hybrid, and hierarchy governance structures**

Attributes	Market	Hybrid	Hierarchy
Instruments			
Incentive intensity	++	+	0
Administrative control	0	+	++
Performance attributes			
Adaptation (A)	++	+	0
Adaptation (C)	0	+	++
Contract law	++	+	0

++ = strong + = semi-strong 0 = weak Source: Williamson (1991).

### *The design of vertical control*

Agency theory deals with the relationship between two parties in which one party (the principal) delegates work to another (the agent). The theory is focused on the contract between these two parties and seeks to determine the optimal contract, i.e., the contract with the most efficient organization of information and the lowest costs. This agency structure is found in a wide range of settings such as relations between employers and employees, owners and managers, insurance companies and their customers, buyers and suppliers, etc.

Eisenhardt (1985, 1989), borrowing from Ouchi and from Barney and Ouchi, shows that agency theory and organization theory have important links and complementarities, mainly because both of them deal with ambivalent cooperative/conflictual behaviors. We will see that this complementarity is particularly relevant for the study of control strategies between firms.

Two branches in agency theory are generally recognized (Eisenhardt 1989): the positivist theory and the principal-agent theory. The two streams of thought share a common unit of analysis (the contract between a principal and an agent) and similar assumptions, but differ in the formal treatment. The first branch is more descriptive and mainly concerned by the relevant variables, the "governance mechanisms," of contracts. The second branch develops models—under a wide range of quantitative variables—and defines the contracting optimum solutions.

According to Eisenhardt (1989), these differences are not crucial for organization theory. The contracting problem remains with its two dimensions: the agency problem and the risk-sharing problem. The agency problem arises because of information asymmetry between the parties. Adverse selection occurs when one party (principal or agent) is better informed than the other about the characteristics of the transaction. Moral hazard refers to the lack of effort on the part of the agent because the task is too complex to be completely controlled. Besides, the agents may differ in their behavior vis-à-vis risk; agency theory tries to resolve both the question of risk sharing and of the cost of transferring that risk.

The organizational approach to control suggests that two strategies are available:

1. Assessing the performance of the agent, measured either by the behavior or its outcome. The cost of this performance evaluation depends upon the information characteristics of the performed tasks. According to Eisenhardt, these characteristics are the ability to know the transformation process (task programmability) and the ability to measure outcomes (separability).
2. Minimizing the divergence of interests and/or preferences among the members. In that case, the need to control members is lessened because they "understand and have internalized the goals" (Eisenhardt 1985). Numerous means could achieve this objective, among them the selection of members, training, etc.

The choice between these two strategies is essentially determined by the ease of performance evaluation, i.e., readability of tasks in both their programmability and separability dimensions.

In a simple low/high framework applied to the dimensions of task characteristics, the control strategies can be classified in three categories (Table 2.3). This representation of control design may be usefully completed by several elements borrowed from agency theory perspectives.

### **Table 2.3 Organizational theory and control strategy**

Outcome measurability	Perfect (Task programmability)	Imperfect (Task programmability)
High	Behavior/outcome control	Outcome control
Low	Behavior control	Socialization (clan control)

Source: Eisenhardt (1985).

### ***A syncretic approach: Mahoney's framework***

Mahoney's work provides a general framework for predicting and prescribing the alternative governance structures of vertical integration. Mahoney recognizes a continuum of governance structures, including spot markets, short-term contracts, franchising, joint ventures, and vertical financial ownership (hierarchy). His approach constitutes an attempt to aggregate agency-related perspectives (such as Eisenhardt's) and transaction cost theory.

His review of the strategic management literature shows that the motives for vertical integration may be classified into three categories: strategic considerations, output and/or input advantages, and uncertainties in costs and/or prices. According to Mahoney, these factors constitute explanations for vertical integration strategies, but "they do not provide insight on the choice of organizational form" (i.e., the governance structure).

The missing link to predict this choice is the existence of transaction costs. In fact, as Mahoney suggests, "in absence of transaction costs, vertical contracting can replicate the advantages of vertical financial ownership." In other words, the effective form of vertical corporate control cannot be predicted when transaction costs are ignored.

In order to understand the choice of governance structure, Mahoney affirms that "measurement costs and transaction costs should be considered simultaneously." Then the governance structure chosen to implement the vertical coordination strategy will minimize the costs of "negotiating, adapting, monitoring, and enforcing buyer-supplier relationships." From this point of view, a comparative institutional analysis between different forms of governance structure will allow consideration of the advantages and the disadvantages of vertical integration strategies.

We have seen that frequency, uncertainty, and asset specificity are the critical criteria of Williamson's framework. For Mahoney, frequency can influence the choice of governance structure especially in case of intermediate asset specificity. But, following Williamson, Mahoney considers that when asset specificity is either low or high, frequency influence is indeterminate. Then two key dimensions remain: asset specificity and demand and/or technological uncertainty.

On the other hand, research on control in organization (especially Eisenhardt and Ouchi) adds two critical variables: programmability and separability of tasks. According to Mahoney, external uncertainties (for example, demand and technological uncertainties) have an indeterminate influence on governance structures and are not included in his framework. Hence, three dimensions are combined in an eight-case chart to predict the governance structure (Table 2.4).

**Table 2.4 The organizational form of vertical control/ownership**

	<b>Low programmability Low asset spec.</b>	<b>Low programmability High asset spec.</b>	<b>High programmability Low asset spec.</b>	<b>High programmability High asset spec.</b>
Low nonseparability	Spot market	Relational contract	Spot market	—
High nonseparability	Spot market	Clan (hierarchy)	Inside contract	Joint venture Hierarchy

Source: Mahoney.

## Strategic Management Theory and Institutional Analysis

Porter's interest in vertical integration strategies initiated abundant research in the strategic management field. His 1991 article summarizes his main concepts. For Porter, the basic unit of competitive advantage is the discrete activity. The firm is a "collection of discrete, but interrelated economic activities such as products being assembled, salespeople making sales visits, and orders being processed." A firm's strategy defines its configuration of activities and how they interrelate. Consequently, competitive advantage will result "from a firm's ability to perform the required activities at a collectively lower cost than rivals, or perform some activities in unique ways that create buyer value and hence allow the firm to command a premium price" (Porter 1991).

Porter defines the value chain as "activities that directly produce, market, and deliver the product and those that create or source inputs or factors (including planning and management) required to do so. The firm's strategy is manifested in the way in which it configures and links the many activities in its value chain relative to the competitors" (Porter 1991).

The central interest of Porter's approach is his concept of vertical coordination (along a value chain) as a result of a firm's behavior. Stimulated by this approach, strategic management scholars will adopt this perspective and will focus their research on the links between environmental circumstances and a firm's strategy. Hence, the study of strategy appears to be an in-house means of investigation into the vertical coordination process.

Harrigan (1984, 1986) represents a classical strategic management perspective on vertical integration. She develops a complete framework for the formulation of vertical integration strategies. She proposes an extended model of choice, including the breadth of integrated activities undertaken; the number of stages of integrated activities; the degree of internal transfer for every vertical linkage; and the form of ownership used to control the vertical relationship. Substantial additions have been made to the simple make-or-buy decision model, but the main factors that determine the choice of vertical integration strategy are coherent with industrial organization assumptions and Porter's theory of strategy. These factors are demand uncertainties, nature of competition (on the buyer/supplier interfaces), and corporate strategy requirements.

Recent contributions are more directly connected with new microeconomics research (essentially in transaction cost and agency fields), or at least concerned with the possible bridges between the two areas of strategic management and organizational economics. Four of the most recent and significant works are particularly stressed here.

The tendency toward vertical disintegration frequently observed in manufacturing industries is the starting point of Boone and Verbeke's 1991 analysis. According to them, a simple transaction cost analysis does not provide a full explanation of this phenomenon because the Williamsonian paradigm underestimates the bureaucratic costs and the incentive problems of hierarchy. Moreover, the strategic implications of vertical integration are ignored. Thus they extend transaction cost theory through the introduction of "conceptual elements" from organization theory and strategic management theory.

While economizing on transaction costs, vertical integration may, on the other hand, significantly increase the bureaucratic costs. According to Boone and Verbeke, "the competitive strategy chosen by the firm largely determines the level of bureaucratic costs and may thus influence the optimal level of vertical integration." Their main statement is that bureaucratic costs are not automatically determined by the structural conditions of internalization, but are, on the contrary, related to the strategic choices of the firm. Consequently, the incomplete character of transaction cost analysis leads to an overestimation of the advantages of vertical integration.

For Boone and Verbeke, the optimal degree of vertical integration stems from two core variables: asset specificity and the importance of innovation and flexibility in competitive strategy. The level of asset specificity is coherent with the original transaction cost model. The degree of flexibility of the competitive strategy is a particularly relevant variable because it is highly interrelated with costs due to the internalization of the transaction.

In the cases of intermediate or high asset specificity and innovation strategies, hybrid forms of vertical coordination are likely to occur. Indeed, the two extremes (hierarchy and market) are both inefficient because of too high bureaucratic costs in the former case or uncertainty of the transaction in the latter case. Thus the main challenge for the firm is to "develop strategic networks of contractual arrangements, so as to build reciprocal commitments with suppliers." This is what Boone and Verbeke call the "strategic management of contractual relations" wherein "benefits normally associated with a hierarchical organization (coordination and control) can be obtained, but without incurring the bureaucratic costs of such a hierarchy." Various forms of long-term contracts will benefit from the high power incentives of the market, but in case of dissatisfaction, contractual arrangements may be canceled.

Finally, for Boone and Verbeke, vertical coordination cannot be explained solely in terms of transaction costs. The necessity for a firm to have "flexibility and innovation (of its) corporate strategies (partly as a reaction to environmental dynamism—such as rapid changes in demand or new information technologies)" lessens considerably the theoretical advantages of vertical integration.

Hennart (1993, 1994), on his side, addresses two main criticisms of transaction cost analysis. First, this theory is only a theory of market failure and does not explain why a particular firm will succeed. Second, the two classical categories of market and hierarchy are irrelevant because most of the governance structures cannot be classified under these two categories. Utilizing concepts from agency and organization theories, Hennart's view is an attempt to extend transaction cost theory to a general model of competitive advantage through organization.

First, Hennart (1993) distinguishes two notions that are usually confused: (1) the methods of organizing, i.e., the mechanisms utilized to conduct the transactions (price constraints or behavior constraints), and (2) the institution, i.e., the organization that implements a particular set of organizing methods. While markets rely principally on prices and firms on hierarchy,

Hennart (1993) insists that "there is not a one-to-one correspondence between prices and markets, and hierarchy and firms."

Then, Hennart broadens the definition of transaction costs in defining the shirking costs (the costs of constraining behavior plus the residual amount of shirking due to imperfect behavior constraints) and cheating costs (the costs of using price-constraint systems—i.e., of measuring output—plus the losses due to imperfect measurement). While the choice of a price-constraint system minimizes shirking but encourages (or at least allows) cheating, the choice of a behavior-constraint system, on the contrary, minimizes cheating but encourages shirking. Under particular transaction conditions and considering the existence of diminishing returns to measuring output and constraining behavior, institutions will try to combine price and behavior constraints in order to reach the lowest global costs. This extended concept of "organizing costs" is the foundation of Hennart's theory of the firm.

The distinction between intra- and interfirm transactions is "that intra-firm transactions are mediated by employment contracts, while inter-firm transactions are contracts for outputs. Choosing the appropriate mix of contracts and improving the efficiency of each type is a source of competitive advantage" (Hennart 1994). The source of rents is the ability of a firm to better coordinate its activities. In fact, three strategies are available: reduce organizing costs within firms, increase efficiency of external contracts, and assess more efficiently the costs of alternative strategies.

In other words, competitive advantage arises from "inter-firm differences in their organizing capabilities" (Hennart 1994). In that sense, the role of strategy is essentially one of implementation and coordination, in "reducing both internal and external transaction costs and achieving the lowest total level of organizing costs by developing better internal and external contracts" (Hennart 1994).

Dosi et al. provide a general theory of corporate coherence, i.e., an explanation of the boundaries of the modern corporation. Although not exclusively concerned with vertical integration issues, this theory is very useful to understand vertical corporate coherence, such as the multiproduct scope, the distribution of product portfolios inside firms, and the relative stability of these portfolios. Vertically integrated firms appear, in this view, as one out of several models of corporate coherence.

Fundamentally, the inability of these theories to fully explain the multidimensions of corporate coherence lies in the fact that the firm is seen either as a production function or as a nexus of contracts involving vertically interrelated factors of production. For these authors, an organization is more than a minimization of production and/or transaction costs.

In their attempts to understand coherence, Dosi et al. add new criteria. Borrowing from organizational economics, these authors affirm that four factors are relevant to study: complementary assets, enterprise learning, technological opportunities, and selection. These four factors determine the "evolutionary path" of the firm and the fluctuation of its activities' boundary over time.

**Table 2.5 Corporate coherence matrix**

<b>Evolutionary path</b>	<b>Slow learning / Restricted opportunities</b>	<b>Rapid learning / Rich opportunities</b>
Wide	Coherent diversifiers (low growth)	Coherent diversifiers (high growth)
Narrow	Vertically integrated firms	Specialist firms

Evolutionary path	Slow learning / Restricted opportunities	Rapid learning / Rich opportunities
Converging	Network firms (low growth)	Network firms (high growth)

Source: Dosi et al.

Zajac and Olsen, while stressing the interorganizational strategies of firms, propose another variant of integration between strategic management and transaction cost perspectives. For them, the standard transaction cost theory is only a "single-party analysis of cost minimization and neglects the interdependence between partners." They suggest that an exchange, instead of being passive and costly, can also be a means to construct and create value even if the exchange comes with new transaction costs. They consider that "the transaction-cost theory overemphasizes the structural analysis of interorganizational exchange relationship without taking into account the processual/behavioral aspects."

Instead, their transactional value analysis shows that an exchange can create value that "could otherwise not be created by either firm independently." The classical Williamsonian analysis appears to be relevant in the particular case of a single firm's make-or-buy decision wherein the main (or exclusive) objective is the minimization of costs. But in many other cases, two firms involved in a transaction could also try to develop a common strategy of, for instance, product differentiation. Therefore, the central question will be how to create/maximize this value and how to claim it.

### ***French Institutional Analysis: Convention Theory and Contract Economics***

To be complete on the recent theoretical developments particularly relevant for the study of vertical coordination, one must consider the two following approaches: (1) convention theory and (2) Brousseau's contract economics.

Convention theory is not yet structured in a single theoretical paradigm. We will refer to Eymard-Duvernay's article focused on the central role of quality uncertainty in structuring interfirm relationships. For Eymard-Duvernay, "prices do not constitute a determinant variable anymore to ensure coordination, but one of the links of industrial organization subject to conventional rules. When markets work properly, quality will be assessed without ambiguity by a given price. But quality conventions are necessary when the price alone cannot evaluate quality."

Eymard-Duvernay distinguishes four generic forms of coordination: domestic, industrial, civic, and market. Domestic coordination occurs when uncertainty about quality is solved through trust: for example, long-term relations between agents or use of private brands that increase the quality reputation of products. In industrial coordination, quality is not defined by the agents themselves, but by a third party outside the market who determines common norms or standards. If prices are sufficient indicators to evaluate quality, i.e., if there is no uncertainty about quality, then the market works by itself: this is market coordination. Civic coordination occurs when there is a collective commitment to avoid conflicts (Table 2.7).

**Table 2.7 Quality, quality conventions, and coordination**

Way of defining quality	With uncertainty	Without uncertainty
Externalized (standards, norms)	Industrial coordination	Market coordination
Internalized (trust, authority)	Domestic coordination	Civic coordination

Source: Eymard-Duvernay.

Convention theory has been used in the study of quality conventions found in agricultural subsectors. Valceschini (1993) and Sylvander (1995), have applied this theory to the study of economic coordination. Valceschini (1993) demonstrates that, in the French vegetable processing industry, the traditional articulation between civic and industrial coordinations—where price discovery and definition of quality are centralized—is no longer relevant.

Sylvander (1995) demonstrates that in the French poultry processing industry, "quality specifications influence the choice of coordination mechanisms" and, consequently, the way firms compete and cooperate. Notably, this is the emergence and the strengthening of an industrial convention that determines the economic behavior of the firms. In this industrial convention, quality is defined and controlled by a third party. Each grower is held to a strict set of standards and requirements about feed, genetic stocks, housing conditions, etc.

Brousseau's (1993) contract economics extends the Williamsonian paradigm but reconsiders some of his fundamental assumptions in a positivist way. He proposes a general theory of bilateral economic relations and combines, in an original fashion, transaction cost theory and elements of industrial organization. His contribution completes the Williamsonian paradigm in two main directions: (1) the description of contracts and (2) the way these contracts are chosen.

First, Brousseau proposes a discrete and descriptive grammar of contracts. Contracts are complex, and a unified framework to describe this complexity is needed. For Brousseau, every contract can be interpreted as a set of clauses, with several possibilities for each clause. These clauses are based on the main functional characteristics of contracts. Then each particular contract is fully described by a specific combination of the alternatives of the seven clauses.

Unlike Williamson, Brousseau does not consider that the choice of a governance structure is strictly determined by the structural conditions of the transactions. One must consider the objectives of the contracting process, which will depend greatly upon the asset specificity and distribution. Different objectives lead to different optimization rules: the simple transaction cost minimization objective is completed by rent maximization of either the coalition or of the agent having bargaining power.

## Implications for the Study of Vertical Coordination

### *Institutional and Strategic Perspectives on Vertical Coordination*

As Spulber (1992) suggests, "Vertical integration provides in varying degrees the beginning of a theory of the firm because [it] addresses the rationale for including specific activities within the firm." Mahoney, in the same vein, considers that vertical coordination and theory of the firm are "largely isomorphic." Indeed, if vertical coordination can be seen as a process of selecting and organizing activities, the questions of the boundaries and of the conceptual essence of the firm inevitably arise.

What institutional theories, in their diversity, show is that economic and legal aspects cannot be easily separated. Organizational issues need specific concepts. The contract, as an economic concept, is a particularly pertinent subject for the study of economic organizations. Pertinence of new concepts lies in the fact that they provide a different vision of reality and that specific facts, until now neglected, are taken into account. The contract provides this unified vision and it becomes the central unit of analysis.

The main interest of contractual approaches is their ability to introduce in the analysis more realistic assumptions about agents' behaviors, such as bounded rationality and opportunism. Coordination issues permanently cope with the existence of an uncertain environment and with the fact that individuals or firms seek to satisfy their own interests and try to use advantageous positions. Another pertinent contribution of contractual approaches is the concept of institution. An institution combines a particular distribution of power over assets with specific exchange mechanisms.

Vertical coordination is the result of a highly complex process. With a dynamic and uncertain environment, and incomplete information about opportunistic partners and competitors, the choice of a coordination mechanism surely cannot be understood in a purely determinist way.

In fact, strategic management scholars and economists like Brousseau share a common interest in the study of the decision process. Opposed to determinist models of choice, they open the way for a specific concept of coordination, deliberately focusing on the planning process. For them, the choice of alternative linkages is a result of goal-directed collaboration or conflict among the economic agents who make the exchange, but not (or not only) the result of external/structural forces. Consequently, the building of a determinist framework appears to be unrealistic. In an uncertain environment, there is no optimal equilibrium. Instead, economic agents are radically opportunistic and will adopt strategies that will maximize their own utility.

This approach has important consequences and modifies underlying assumptions of economic analysis. Its role is therefore to understand and explain the behavior of agents. The choice of an organizational structure reflects not only the basis of cost, but also the existence of hierarchy and power relationships. One cannot predict the result of economic agents' behavior, but it is possible to better understand how they will make their decisions and what is their process of choice.

This procedural concept of rationality leads one to reconsider the question of efficiency. Notably, the traditional criterion of transaction cost minimization must be reexamined for several reasons. First, bargaining power within the coalition will benefit the dominant agent, who may have other objectives than a transaction cost minimization. Secondly, the goal of the coordination process may differ greatly as a function of the competitive situation. And the two more common generic strategies, cost domination and product differentiation, suggest that the objectives assigned to a particular vertical coordination process could be either cost minimization or value maximization. Third, as shown by the convention theory, institutional arrangements can affect greatly this notion of efficiency; collective rules will define specific coordination mechanisms involving factors not necessarily economic.

### ***A Descriptive and Modular View of Vertical Coordination***

One of the main interests of institutional analysis is to provide new categories to describe economic reality. The first step of this description is the identification of two institutional levels: institutional environment and institutional arrangements. Williamson, in a recent paper, insists deeply on this distinction. "The institutional environment is the set of fundamental

political, social and legal ground rules that establishes the basis for production, exchange and distribution. Rules governing elections, property rights and the right of contract are examples. . . . An institutional arrangement is an arrangement between economic units that governs the ways in which these units can cooperate and/or compete" (Williamson 1993a).

Two dimensions are sufficient to describe the entire possibility of institutional arrangements: (1) the distribution of ownership/control over assets and (2) the mechanisms involved in the exchange.

As shown by Table 2.8, a diagram matching the ownership/control and the exchange mechanism dimensions allows the description of a wide range of vertical coordination institutions. An institution can be defined by the way authority(ies) is(are) distributed over a specific sequence of assets and by a particular choice of exchange methods between these assets.

**Table 2.8 A modular and descriptive concept of institutional arrangements**

<b>Mechanism of exchange and/or control</b>	<b>Unified Internal control</b>	<b>Bilateral External control</b>	<b>Bilateral No control</b>
Price constraints	Vertical integration: profit-center firm	Vertical contracting: piecework	Pure market
Mix price/behavior constraints	Vertical integration: price + behavior control	Vertical contracting: piecework + monitoring	Alliance or agreement
Behavior constraints	Pure vertical integration	Vertical contracting: monitoring	Alliance or agreement

*Source: Sauvée.*

### ***Vertical Coordination as a Positive Framework of a Firm's Decision Making***

The framework developed here contains two main objectives: (1) to provide a full description of vertical coordination in its main institutional characteristics and (2) to propose a model of decision making within the firm concerning the choice of these characteristics. In a process of decision making, a wide range of variables acts simultaneously. But, for the analysis, we propose a two-step model, in correspondence with the two main dimensions of our coordination description.

Table 2.9 summarizes the main characteristics of the analysis. The first step is industrial organization/competitive analysis oriented. Results from this first step play as "basic conditions" of vertical coordination: existence of authority relations, firm's strategic objectives, number of technological stages, etc. The second step focuses on the contract's design. Indeed, there is a full spectrum of possible outsourcing arrangements, and one must consider the nature of transactions (uncertainty, opportunism, etc.) to understand this choice. In fact, this two-step model is largely a matter of perspective.

**Table 2.9 Vertical coordination as a decision-making process: An analytical framework**

	<b>First step Production (assets)</b>	<b>Second step Exchange (transactions)</b>
Focus	Layout of industry chain stages; authority relations; strategic objectives of the coordination process	Control and exchange mechanisms; agency problems; incentives problems
Variables	Technological variables; Asset specificity; Coalition vs. competitive environment	Transaction characteristics; Uncertainty; Tasks' programmability and separability
Approaches	IO analysis; Competitive/institutional analysis; Convention theory analysis	Transaction/coordination costs analysis

Source: *Sauvéé*.

## **An Illustration in Agribusiness: The U.S. Broiler Industry**

The framework developed above can be applied to a particular subsector in order to understand how a firm will choose its vertical coordination strategy. The U.S. broiler industry is highly competitive and has benefited from a constant shift in substitution effects from other types of meats. Indeed, during the period 1960–1994, the consumption per person increased from 19.2 to 49.7 pounds for broilers, while increasing only from 59.8 to 63.6 pounds for beef (all figures are boneless weights). Many socioeconomic factors have favored this trend, but the ability of firms to increase productivity and reach new consumer needs is likely to be a determinant. The industry concentration remains relatively low.

One of the most distinguishing characteristics of the broiler industry is probably its vertical organization. Indeed, the spot markets are virtually absent and the totality of vertical exchanges between production and processing stages occurs through vertical contracting and integration. According to several inquiries, the resource-providing type of vertical contracting is largely predominant (from 80 percent to 90 percent) while pure vertical integration is around 10 percent of the total value of farm-originated inputs. In a resource-providing contract, the processing company provides feed, chicks, medicine, a management program, and technical and management advice services. The grower provides housing, labor, and management and technical skills.

Asset specificity is high in this industry. This is essentially a site specificity: feed milling, growing, and processing activities are tied together through their proximity. Indeed, high costs of transportation of both feed, chicks, and live chickens prevent a dispersion of the operations. The asset distribution, along the industry chain, can be featured as a bilateral dependency: about twenty coalitions (that account for about 80 percent of the domestic market) that are highly vertically dependent and facing a competitive environment.

The principal-agent relationship found here has to resolve the generic problems of agency theory: uncertainty about the agents, opportunism of the agents, uncertainty about product quality, incentives for a good performance, risk sharing between the parties. An optimum contract is expected to solve these problems at the lowest cost.

The question of price discovery remains. Knoeber describes the contract commonly found in the broiler industry: the performance-order tournament. The grower is paid per pound of live broiler produced. This is a piece-rate contract with outcome-based control. The size of this per-

pound rate is not fixed but is instead determined by the relative performance of the grower compared with other contestants.

This type of relative performance-order tournament has several advantages. First, it requires a relatively simple and cheap measure of performance. A comparison of, for instance, fifteen growers' inputs consumption and output production, will be sufficient. The processor company, being the supplier/buyer, has a perfect knowledge of this consumption/production. Moreover the separability problem is minimized: the company determines easily each individual performance. But, more importantly, this contract has high incentives.

These contracts are short term, usually one year. But in order to minimize opportunism and risk for both principal and agents, they are tacitly renewed each year, unless repetitive poor performance occurs.

The existence of a small proportion of pure vertical integration is problematic. But it could be interpreted in many ways. It gives an objective indicator of the settlement costs without the bias of growers' behavior. It can be a means to innovate with new inputs and new management programs more easily than with an independent grower. Finally, a direct control over a small part of the production will allow the company to respond more quickly to the demand fluctuations.

This example shows that an integrative framework using insights from different theoretical backgrounds helps to better understand the genesis and shape of vertical coordination in a particular subsector.

## Conclusion

Our understanding of vertical coordination benefits greatly from new approaches in institutional economics, organizational economics, and strategic management. New concepts and new assumptions allow a more realistic and more complete vision of coordination and broaden considerably the scope of the analysis. But schools of thought are diverse and far from being unified. The main methodological oppositions are found between organizational economics and strategic literature perspectives; the intense debate existing between these two fields is symptomatic.

In spite of important progress, many questions remain unsolved. Among these problems, the question of organizational efficiency and of its assessment is particularly problematic. Indeed, as soon as the source of organizational dynamics and change can no longer be found in the optimization of a production function, theorists must provide new explanations. For instance, economic treatment of incentive problems in organizational economics is incomplete. Indeed, as Simon suggests, "economic rewards are not the only means of motivation available." Notions such as loyalty, commitment, and trust explain greatly the behavior of economic agents (and therefore organizational efficiency) but do not fit easily in economic concepts.

Another fundamental question lies in the methodological assumptions. In agency and transaction cost theories, vertical coordination is fully understandable at a microeconomic level. For convention and organization theories, and strategic management perspectives, the building of an intermediate level is an indispensable step in the analysis. Indeed, the "structure" is more than its components and has emergent properties. We think it is necessary to take into account structural criteria for a full understanding of vertical coordination mechanisms. But, as Brousseau (1993) suggests, this structural analysis should not prevent one from using transaction cost economics concepts.

The ability to explain why heterogeneous vertical business linkages emerge, remain, and compete is far from being achieved. Vertical coordination decisions are the result of complex procedures. Despite promising concepts and significant results, a full understanding of this phenomenon challenges future research. The progressive building of an institutional analysis, implementing organizational economics and strategic management, should contribute to this future research.

## Notes

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2. We will define vertical coordination as the process of specifying—for a reference firm and activity—a particular configuration of ownership, control, and exchange over upstream/downstream activities.
3. For a review of vertical coordination issues through industrial organization, see Henderson.
4. Since the seminal works by Mighell and Jones and by Goldberg, the study of vertical coordination in agricultural subsectors has been particularly rich.
5. Five kinds of asset specificity are found: site specificity, physical asset specificity, human asset specificity, dedicated assets, and brand name capital (Williamson 1989).
6. This concept of efficiency is closed to neoclassical assumptions; perfect competition conditions lead to economic efficiency.
7. This author provides a good synthesis on transaction cost limitations about vertical integration issues.
8. The main authors of these two streams are Jensen and Meckling, for the former, and Grossman and Hart, for the latter.
9. Programmability is the ability to observe what and how the work is done. Separability is the ability to observe/identify who has done the work.
10. External uncertainties can either favor or prevent a vertical integration strategy.

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