

## CHAPTER 15

# GOVERNANCE STRUCTURES IN THE DUTCH FRESH-PRODUCE INDUSTRY

JOS BIJMAN

*Department of Business Administration, Wageningen University, Hollandseweg 1,  
6706 KN Wageningen, The Netherlands. E-mail: jos.bijman@wur.nl*

**Abstract.** A governance structure is the set of public and private rules that govern the execution of a transaction. Governance structures affect the efficiency of transactions by solving two basic problems of exchange: coordination and safeguarding. Coordination refers to the alignment of the activities of two or more parties involved in the same transaction. Safeguarding refers to protecting against exchange hazards such as shirking and hold-up. This paper presents a model for studying governance structure choice. The model goes beyond traditional conceptualizations of governance structure by identifying the governance mechanisms that solve the safeguarding and coordination problems. The model is applied to changes in governance structures in the Dutch fresh-produce industry.

**Keywords:** governance structure; transaction costs; safeguarding; coordination; fresh produce

### INTRODUCTION

For a long time, one governance structure dominated the marketing of fruits and vegetables in The Netherlands: the cooperative auction. Recently, this governance structure has lost much of its appeal, while new governance structures have become more popular. This paper tries to explain both the long-time popularity of the cooperative auction and the recent growth in different sales structures. It uses concepts from economic organization theory, organization theory and social-network theory. The paper develops an integrated model for studying governance structure change and presents a first application of the model to the changes in the Dutch fresh-produce industry over the last decade. The model goes beyond traditional conceptualizations, which treat a governance structure as a black box. Our model specifically targets the two main functions of every governance structure – safeguarding and coordination. It focuses on the various governance mechanisms that can be used to solve the problems of safeguarding and coordination. In doing so, it also acknowledges the distinction between formal and informal mechanisms.

The paper starts with a brief explanation of the causes of transaction costs, and with answering the question: what is a governance structure? Then, the two main *C.J.M. Ondersteijn, J.H.M. Wijnands, R.B.M. Huirne and O. van Kooten (eds.), Quantifying the agri-food supply chain, 205-221.*

© 2006 Springer. Printed in the Netherlands.

functions of each governance structure – safeguarding and coordination – are discussed. This review of the literature results in the theoretical model. After a brief description of the marketing channels in the Dutch fresh-produce industry, the model is applied to explain the popularity of the dominant governance structure, the grower-owned cooperative auction. Next, the shifts in governance structure in the last decade will be described and explained with the model. We will finish with conclusions on the applicability of the model.

### TRANSACTION COSTS AND GOVERNANCE STRUCTURE CHOICE

The concept of governance structure comes from institutional economics, as developed by Coase (1937), Klein et al. (1978), Williamson (1979; 1987; 1991), Barzel (1982), Cheung (1983) and many others. Central in institutional economics is the notion that costless exchange between any two of more economic agents (persons, firms or organizations) does not exist. Any transaction will come with costs for the agents: transaction costs.

Transaction costs are the costs of contact, contract and control, i.e., the costs associated with finding a market and a trading partner, negotiating an agreement, and monitoring and enforcing the contract. Transaction costs are caused by the particular characteristics of a transaction. In the economic organization literature we find at least five characteristics of transactions that affect the size of transaction costs: asset specificity, uncertainty, frequency, measurement problems, and connectedness to other transactions.

Williamson (1979; 1987) distinguishes three characteristics: the presence of transaction-specific assets (i.e., asset specificity), the uncertainty surrounding or the complexity of the transaction, and the frequency of the transaction. Other authors have added the difficulty of performance measurement, and the connectedness of a transaction to other transactions. The difficulty of performance measurement (because of information asymmetry) is a typical agency problem (Barzel 1982; Holmström and Milgrom 1991; 1994). A fifth potential cause of transaction costs has been added by Milgrom and Roberts (1992): the connectedness of a transaction to other transactions carried out by other parties. The notion of connectedness in organizational economics is the same as the notion of interdependence in traditional organization theory.

Transaction Cost Economics (TCE) posits that when transaction cost are low, the transaction will be carried out through the governance structure *spot market*, and when transaction costs are high, it becomes efficient to set up an organizational structure (*hierarchy* in the terminology of Williamson) for carrying out the transaction. In between market and hierarchy, there is the governance structure *hybrid*. Williamson (1991) emphasizes the discreteness of governance structures. Cheung (1983), building on Coase (1937), has developed the notion of a continuum of governance structures.

When transaction costs increase or decrease, a different governance structure may be chosen to carry out the transaction. Such a shift in governance structure, either from one discrete form to another or along a continuum, raises the question

what is actually changing. Which attributes of a governance structure may change when one or more of the five characteristics of transactions change? Answering this question requires a closer look at the constituent elements and the functions of a governance structure.

### WHAT IS A GOVERNANCE STRUCTURE?

Williamson (1979) defined a governance structure as “the institutional framework within which the integrity of a transaction is decided”. Other authors, applying or further developing TCE, have used governance mechanism or governance form instead of governance structure. For instance, Hesterley et al. (1990, p. 403) provide the following definition: “a governance mechanism includes any institutional arrangement that serves to influence the exchange process”. Besides by the private institutional arrangement, transactions are also governed by the institutional environment, such as laws and rules that apply beyond the specific transaction. These laws and rules may also be considered parts of the governance structure.

In institutional economics, the emphasis is on formal institutions, such as laws, contract rules, formal codes of conduct, and official arrangements, which together make up the governance structure. However, informal institutions, such as norms, traditions, customs and culture, also influence transactions. The role of informal institutions in supporting transactions has been emphasized by social theorists, studying the embeddedness of exchange relationships. This embeddedness has two dimensions: relational and structural (Granovetter 1992). Relational embeddedness refers to the ongoing social relationship that results from repeated transactions with the same partner. Structural embeddedness refers to the fact that the dyadic relationship is embedded in a community of former, current and potential exchange partners. Being part of a community, where information on individual behaviour is exchanged, leads to a reputation effect. A central theme in the research on embeddedness is that repetitive market relations and the linking of social and business relationships generate embedded logics of exchange that differ from those emerging in traditional arms-length market relations (Borgatti and Foster 2003). Social mechanisms, such as reputation, restricted access, macroculture and social sanctions, are important elements of network governance (Jones et al. 1997).

We conclude that two perspectives on governance structures exist. Institutional economists focus on the formal institutions, while social-network theorists use a broader definition by also including informal institutions. In this paper we adhere to the broad approach, and define a governance structure as the set of formal and informal institutions that regulate a particular transaction.

### SAFEGUARDING AND COORDINATION

To understand changes in governance structure it is not sufficient to know what a governance structure is; it is also necessary to know what a governance structure does. TCE posits that a governance structure is chosen in order to economize on transaction costs. But how does a governance structure support efficient

transactions? Williamson (1999) emphasizes three basic elements of all transactions: mutuality, conflict and order. "Governance is a means by which to infuse *order* in a relation where potential *conflict* threatens to undo or upset opportunities to realize *mutual gains*" (Williamson 1999, p. 1090). This means that a governance structure furthers the efficiency of a transaction by supporting the realization of mutual gains and by preventing or solving conflicts. Putting it differently, we may state that the two main functions of a governance structure are coordination (to obtain the mutual gains) and safeguarding (to avoid conflict and premature termination of the agreement).

The problems of coordination and safeguarding are usually studied from different theoretical perspectives. Theories that emphasize the need to safeguard an agreement start from the assumption that parties have conflicting interests and therefore may behave opportunistically, taking advantage of a situation of asymmetric information. Theories emphasizing the need for coordination assume corresponding interests, but acknowledge the bounded rationality of human actors. These theories focus on the methods to solve the problems of incomplete or asymmetric information between transaction partners.

Most economic approaches to efficient governance structure choice have focused on the safeguarding function. Typically, in TCE it is claimed that behavioural uncertainty and bounded rationality lead to contractual hazards such as the appropriation of quasi-rents by one of the transaction parties in situations with asset specificity. Also measurement problems in transactions lead managers to choose a governance structure that minimizes the transaction costs caused by the combination of incomplete/asymmetric information and incomplete commitment. In TCE, it is control over particular assets that provide protection against the threat of hold-up. Thus, a governance structure helps to safeguard investments because it contains a particular distribution of property rights and therefore provides formal control over the deployment of assets. Another economic approach that studies the safeguarding problem is the new property-rights theory, developed by Grossman and Hart (1986) and Hart and Moore (1990). This theory of the firm starts from the assumption that all contracts are incomplete and that lock-in or hold-up may develop when investments are relationship-specific. Ownership of particular assets may prevent ex-post lock-in or hold-up, because the owner of an asset is in a good position to bargain over the deployment of that asset. Expecting the risk of ex-post appropriation, contract partners may take suboptimal ex-ante investment decisions. By shifting the ownership of specific assets, the efficiency of the transaction can be improved.

So far, we discussed the safeguarding problem. However, firms choose governance structures not only to address appropriation concerns, but also to manage anticipated coordination problems. Coordination costs are the costs of information processing and decision-making that result from decomposing tasks between partners to an exchange. Coordination costs and the mechanisms for dealing with these costs have traditionally been object of study in organization theory. Focusing on the organization of activities within firms, organization theory emphasized the role of hierarchical controls in reducing coordination costs.

Interorganization coordination costs arise in transaction relationships where partners have agreed upon a division of labour and have to coordinate and manage, across organizational boundaries, activities to be completed jointly or individually. Within organization theory, a fundamental principle defining the costs of coordination within organizations is the concept of interdependence (Thompson 1967). An organization is dependent on some element of its task environment (1) in proportion to the organization's need for resources or performances that that element can provide and (2) in inverse proportion to the ability of other elements to provide the same resource or performance (Thompson 1967, p. 30). When dependence is mutual, it has been named interdependence. Interdependence can be symmetric, but is more likely to be asymmetric.

Thompson (1967) distinguishes three types of interdependency: pooled, sequential and reciprocal. With pooled interdependence, each part of an organization renders a discrete contribution to the whole and each is supported by the whole. The parts are interdependent in the sense that unless they perform adequately, the total organization is jeopardized. With sequential interdependence, the output of one part is the input for another part. Parts that experience sequential interdependence are also interdependent in a pooled way. With reciprocal interdependence the output of each part becomes input for the other parts. In other words, each part poses contingency for the others. Reciprocal interdependence also includes pooled and sequential interdependence.

There are three types of coordination mechanisms associated with the three types of interdependency (Thompson 1967): with pooled interdependence, coordination by standardization is appropriate; with sequential interdependence, coordination by plan is appropriate; and with reciprocal interdependence, coordination by mutual adjustment is called for. The three types of coordination, in the order presented here, place increasingly heavy burdens on communication and decision. Mintzberg (1979) has elaborated on these coordination mechanisms within organizations. Although Thompson wrote about intra-firm interdependencies, his typology can also be applied to inter-firm interdependence situations. Of course, in inter-organizational transactions, also prices function as coordination mechanisms.

The theoretical framework relating particular coordination mechanisms with particular governance structures is still in an embryonic stage. Few studies exist that explicitly develop propositions about this relationship. Exceptions are Grandori (1997) and Gulati and Singh (1998). Both use Thompson's typology of interdependencies as a proxy for coordination costs. For instance, Gulati and Singh (1998), in their study on the relationship between coordination costs and the choice of governance structure in inter-firm alliances, propose that when the nature of interdependence shifts from pooled to sequential to reciprocal, coordination costs increase. The authors have operationalized interdependence on the basis of the value-creating logic(s) of each alliance. Particular value-creating logics result in particular interdependencies and thereby lead to specific coordination costs.

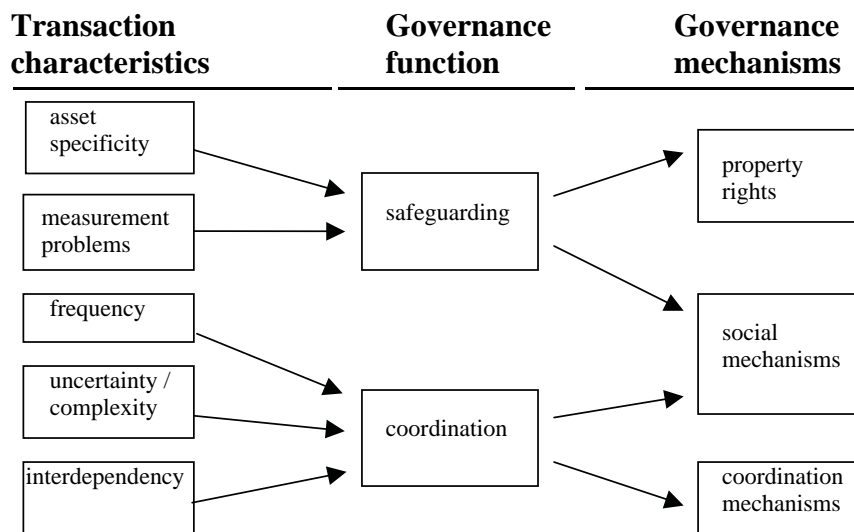
In sum, each governance structure has two main functions: safeguarding the transaction from appropriation of the quasi-rents, and coordinating the activities and decisions among the transaction partners. In situations of conflicting interests, a governance structure is meant to avoid conflicts or provide solutions to a conflict.

Even when interests perfectly correspond, transaction costs arise because time and effort must be spent on information exchange and decision-making.

### A THEORETICAL FRAMEWORK

So far, we have discussed the economic and organization literature about governance structure, its functions and its attributes. Five sets of characteristics determine transactions costs and thereby the choice of governance structure. Governance structures have two main functions: safeguarding and coordination. These functions are obtained through various formal and informal mechanisms (or institutions). In this section we will try to bring these elements together in a comprehensive model for studying shifts in governance structures (Figure 1).

The five characteristics of transactions determine the problems of safeguarding and coordination. To solve these problems, specific governance mechanisms are used. The problem of safeguarding investments is mainly determined by asset specificity and measurement problems. The problem of coordination is mainly determined by the frequency of the transaction, the uncertainty and complexity of the transaction, and the interdependence of the transaction with other transactions.



*Figure 1. Governance functions and governance mechanisms*

Each governance structure consists of a specific set of governance mechanisms, such as a particular distribution of property rights, particular social mechanisms and coordination mechanisms. Social mechanisms are informal mechanisms, while property rights and coordination mechanisms are formal mechanisms. For safeguarding, the most important formal mechanism is administrative control based

on property rights. It is the owner of an asset who can decide about deployment of and access to that asset, both in the ex-ante and ex-post situation. When asset specificity increases or when performance measurement becomes more difficult, a different distribution of property rights may provide the necessary safeguarding. Informal mechanisms such as reputation and social control may also provide protection against opportunistic behaviour. For coordination, several formal mechanisms are available, such as standardization, direct supervision and mutual adjustment. For frequent transactions, standardization is the most appropriate mechanism. For transactions with high uncertainty and/or complexity, the appropriate coordination mechanism may be direct supervision or mutual adjustment, depending on the distribution of property rights. For transactions that are interdependent with other transactions, several coordination mechanisms can be used, depending on the type of interdependence. If the interdependence is of a pooled kind, standardization may be sufficient to obtain coordination. If the interdependence is of sequential kind, direct supervision may be more appropriate (besides standardization). If interdependence is of reciprocal kind, mutual adjustment may be the appropriate mechanism. Also informal mechanisms such as restricted access and cultural homogeneity may provide the information exchange and support for decision-making that are needed for coordination.

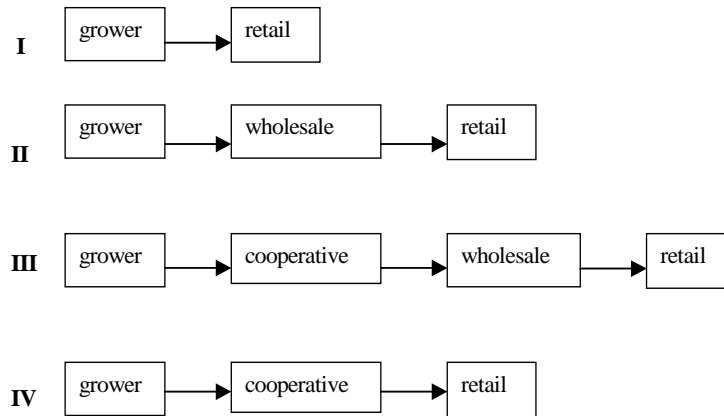
Informal institutions are not easily established and take a long time to materialize. Changes in informal institutions will become effective only after some time. For this reason, in this paper we do not take into account the working of informal institutions, but focus on formal governance mechanisms. Our model leads to the following propositions about the relationship between characteristics of the transaction and mechanisms of governance used for that transaction:

- Proposition 1: increasing asset specificity and/or measurement problems (which imply higher transaction costs) will lead to a change in the distribution of property rights.
- Proposition 2: increasing frequency, uncertainty and interdependence (which imply higher transaction costs) will lead to a shift in coordination mechanisms.

We will now use this theoretical model to assess the governance structures used in the marketing channels for Dutch fresh produce. In doing so, we will focus on the transaction between the grower and his customer (usually a trader).

#### MARKETING CHANNELS FOR FRESH PRODUCE IN THE NETHERLANDS

In marketing channels for fresh produce, we can distinguish at least four parties on the basis of the main functions in the channel: grower, cooperative, wholesaler and retailer. The individual grower specializes in producing fruits or vegetables; the grower-owned cooperative takes care of collection and marketing of the growers' products; the wholesaler (or general: trader) is the party that takes care of shipping the products to domestic and foreign customers, and has both a trading and logistic function; and the retailer, with his distribution function, is the gateway to the consumer.



*Figure 2. Four marketing channels for fresh produce*

For the marketing of their products, growers can choose between different channels, involving two or more of the four main parties (Figure 2). The first marketing channel (I) consists of only two parties: an individual grower sells directly to a retailer. This channel does exist in reality, but is not very common because of scale differences between production and retail, because most retailers prefer to deal with only a limited number of suppliers and not with each producer individually, or because the grower does not want to perform the sales function himself. The second channel (II) consists of grower, wholesaler and retailer. The wholesaler has a collection function as well as a distribution function, buying from growers and selling to retailers. In the third channel (III), growers have delegated the collection and marketing function to a grower-owned cooperative. As the marketing function is carried out by the cooperative, growers collectively benefit from economies of scale and scope in marketing as well as from stronger bargaining power, while individually they can specialize in production. In the fourth channel (IV), the wholesale function is also carried out by the grower-owned cooperative. In this channel, there is no independent wholesaler, as the cooperative directly trades with retailers.

In practice there may be more marketing channels, longer channels or more complex channels. In the case of export, the channel is longer, because there usually is an exporting trader on one side of the border and an importing trader on the other side. For our exposition it is sufficient to distinguish these four main parties.

#### THE TRADITIONAL DUTCH MARKETING CHANNEL FOR FRESH PRODUCE

Traditionally, the dominant marketing channel for fruits and vegetables in The Netherlands is model III. Growers bring their products to the cooperative auction, where they are sold to wholesalers and to some retailers. Wholesalers sell to

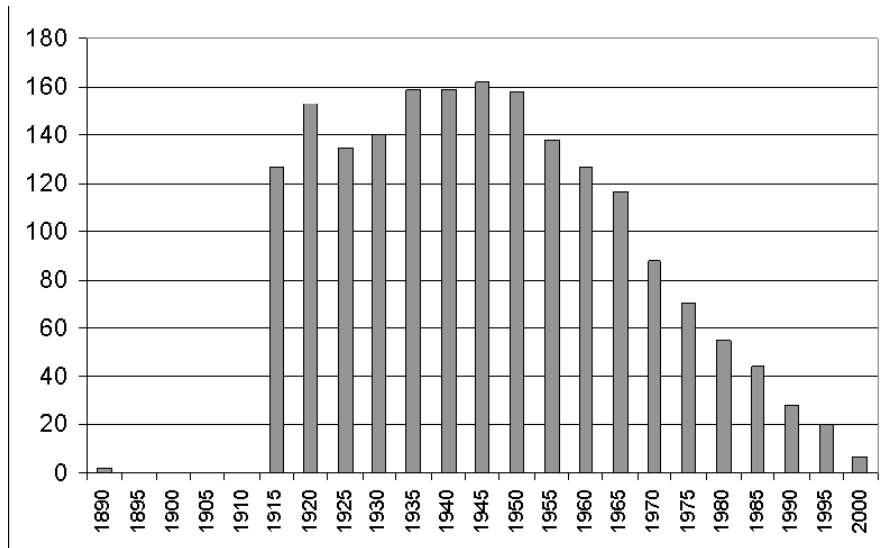


domestic retailers or export the products to foreign wholesalers or retailers. Retail takes care of selling to the final consumer. The main function of the grower-owned cooperative is to provide an organized marketplace for the growers to sell their products. This service included running the auction clock for price determination, sales administration on behalf of the sellers, logistic services (mainly short-term warehousing), and quality classification and inspection (as uniformity in products supports the sales process) (Meulenbergh 1989). For almost a century, the cooperative auction was the most popular marketing channel for fresh produce in The Netherlands.

In the days before the auction, in the 19th century, different marketing channels were used (Kemmers 1987). Growers located in the vicinity of cities sold their products directly to retailers and local traders. Growers in remote areas sold their products to traders, who shipped the produce to the main cities of Holland or neighbouring countries. Several growers had established export associations, hiring sales personnel to find customers abroad. These sales methods had several disadvantages, such as information asymmetry between grower and independent trader, agency problems in monitoring the effort of sales personnel, and high logistic costs because of multiple stages in the marketing channel.

The auction method for selling vegetables was used for the very first time in 1887; while in 1889 the first organized auction was established (Kemmers 1987). The real breakthrough in the popularity of the organized auction for selling fruits and vegetables occurred in the first decade of the 20th century (Kemmers 1987). Because of economic prosperity in Northwest Europe, demand for fresh produce was growing. Growers felt that the traditional marketing structures were insufficiently equipped to exploit the growing demand (Van Stuijvenberg 1977). The auction became popular because of the speed of the sales process, the opportunities for new traders to compete with incumbent firms, and the transparency of the market.

In the early decades of the 20th century, a large number of auctions were established. Every region with professional horticulture set up its own cooperative auction. While exact numbers for the years in between 1890 and 1915 do not exist, Kemmers (1987) gives anecdotal evidence of the rapid increase in the number of auctions in the early years of the 20th century. Figure 3 shows that within 25 years more than 120 new auctions were set up. In 1934 an Auction Law was enacted as part of government policy to alleviate the effects of the economic crisis of the 1930s. This law contained a legal obligation for growers of fresh produce to sell their products through an auction. In 1945 the total number of fresh-produce auctions reached its top with 162 (Plantenberg 1987). After World War II, the number of auctions gradually declined, mainly due to mergers of cooperatives, in order to gain economies of scale. The fastest decrease in the total number of auctions occurred after 1965, when the auction law was abolished. While other marketing channels were becoming more popular, the cooperative auction remained the most dominant one. Between 1965 and 1995 the share of all fruits and vegetables being sold through an auction declined from 100 to 75 percent (Bijman 2000). In 2000, only six cooperative auctions remained.



*Figure 3. Number of vegetable auctions in The Netherlands, 1890-2000*

#### THE COOPERATIVE AUCTION AS DOMINANT GOVERNANCE STRUCTURE

According to TCE logic, the popularity of a particular governance structure is an indication of its efficiency, as over time efficient structures out-compete less efficient structures. Also organizational ecology (Hannan and Freeman 1989) argues that efficient organizational forms will survive in an evolutionary process of variation, selection and retention. With the theoretical framework developed above we can explain why growers chose the cooperative auction as the favourite governance structure.

Traditional transactions between growers of fruits and vegetables and their wholesale customers had the following characteristics:

- moderate asset specificity: temporal asset specificity because of the perishability of the products; moderate site specificity when transportation costs are high; no physical assets that can result in bilateral dependency
- high frequency, because harvested products must be sold immediately
- low uncertainty, as long as products are generic
- high measurement problems in case growers individually contract with a trader
- no interdependence, unless growers collectively sell their products, in which case pooled interdependence is present.

Pure market governance is not an efficient option for growers, because of the transaction costs that result from temporal asset specificity and asymmetric information between grower and trader. Transaction costs are also quite high

because growers have to spend time and effort on investigating and following demand conditions, which are volatile because of the variation in both supply and demand. Transaction costs also result from traders opportunistically using their information advantage. The other extreme, a hierarchical governance structure, is not an efficient option either, as individual growers do not have the scale and knowledge to carry out the wholesale function and traders do not have the idiosyncratic knowledge of the production conditions. Substantial problems of performance measurement would arise when a grower hires a salesperson or when a wholesaler hires a grower. In fact, growers seek a governance structure that will let them specialize in production, outsource the marketing function and benefit from the scale economies in marketing, while avoiding the agency problems that usually come with contracting an independent marketing firm.

The cooperative auction was the efficient governance structure growers were looking for. Information costs are low because of the high transparency of the market. Buyers come to the auction, and the auction clock determines prices. Contract costs are non-existent, because no contract negotiation is needed between sellers and buyers. Monitoring and control costs are very low, because the transaction between grower and buyer is close to a pure market transaction. Thus, no agency problems (i.e., performance measurement problems) are present in the transaction. As growers have to be members of the cooperative and buyers have to be registered, compliance to the auction rules is guaranteed by private order. Moreover, the cooperative provides collective insurance to the growers against buyer default.

The high frequency of transaction and the economies of scale justify the establishment of a particular organization. But why was the auction set up by the growers, and not by buyers or by an independent firm? The explanation comes from the specificity of the auction assets. Site specificity, physical asset specificity and temporal asset specificity are all present in the grower–auction transaction. Site specificity results from the auction being located in the production region, as growers themselves could bring the products to the auction. Physical asset specificity is present because the auction facilities are adjusted to the particular products of the growers. Temporal asset specificity is present because the products are perishable. Growers are the stakeholders that have most to win from investing in the auction facilities, and have most to lose when others control these assets.

Safeguarding from the growers' perspective is obtained through ownership, which entails control over the auction facilities and policies. Given the temporal asset specificity in transactions with perishable products, the cooperative auction puts much effort in improving the efficiency of logistic processes. As owners of the auction facilities, growers could not be held up in the logistic process. Registration of buyers also provided safeguards against opportunistic buyer behaviour. Safeguarding from the buyer perspective was hardly needed, because traders had not invested in specific assets. Where measurement problems could occur, they were prevented by the quality classification system of the auction and the reputation effect (social mechanism) inherent in frequent transactions. In the old days of the vegetable auction the products of each grower were sold separately, so buyers knew

whose product they were buying. As transactions were repeated many times, reputation effects could work.

Coordination was obtained through making the market as transparent as possible and through standardization. Information costs were reduced because growers and buyers did not have to spend effort on studying supply and demand conditions; the auction clock immediately made prices known to everyone. The pooled interdependence that is characteristic of a collective sales organization required standardization of products and processes. Standardization of products was obtained through the quality classification system as well as the uniform packaging requirements. Standardization of work processes was obtained formally by private regulations as well as informally by routines. Coordination was also obtained through informal norms of behaviour for both growers and traders.

#### CHANGING TRANSACTIONS, NEW GOVERNANCE MECHANISMS

In the agri-food industry, a number of changes in market, policy and technology have taken place in recent years that have affected the choice of efficient governance structures. Hobbs and Young (2000) distinguish four relevant changes in the environment: shifting consumer preferences towards more variety, more convenience, higher quality and better safety guarantees; changes in legislation, such as in agricultural policies, environmental policies and food safety regulations; new technologies, such as ICT and biotechnology; and changes in market structure, particularly concentration in the food retail industry. These developments affect the characteristics of transactions with agri-food products, by increasing uncertainty, asset specificity and measurement problems as well as strengthening interdependencies (Royer and Rogers 1998; Hobbs 2003). No significant changes in frequency are found. We will now discuss the changes in the characteristics of transactions with fruits and vegetables, and their impact on safeguarding and coordination. Once again, the focus is on the first trading stage in the marketing channel, that is, the transaction between the grower and his direct customer.

*Asset specificity:* While Dutch fruits and vegetables were traditionally sold under a generic brand (Holland), nowadays each producer group or marketing organization seeks to sell under its own brand name. This can be a consumer brand or a business-to-business brand. Establishing a brand requires substantial investments in advertising and reputation building. The owner of the brand will seek safeguarding to protect its investments against opportunistic behaviour by any other firm that handles the branded products. Asset specificity is also present in the case of specific packaging stations. As more and more vegetables are sold prepacked, the packaging facilities are specific to the products of the grower: the packaging line has to be available when the products are harvested (temporal specificity) and it has to be adjusted to the variety and volume of the grower's product (physical asset specificity).

*Measurement problems:* Measuring performance in fresh-produce transactions has become more difficult because of the particular attributes these products may have, because more products are sold under a brand name, and because of

innovation requiring effort of all chain partners. Food products increasingly have special attributes like environmentally friendly, animal-friendly, non-GMO or organic, which are difficult to measure at the product itself, leading to information asymmetry. From the trader's perspective, there is an adverse selection problem, from the grower's perspective there is a moral hazard problem. Related to the asset-specificity problem described above is the problem of measuring the performance of the trader in supporting the grower's brand. Difficult performance measurement is also present in the case of product innovations that require efforts of several chain partners to generate the full value at the final consumer. As the grower has probably invested most in this product innovation, he has most to lose from a lack of effort by the other chain partners.

*Uncertainty / complexity:* Uncertainty increases when competition increases, for instance as a result of a decrease in the number of buyers. Also the need for more product innovation increases uncertainty, because it is uncertain whether a new product will be a success with consumers. If product innovation requires special effort of all chain partners, transactions become more complex.

*Interdependency:* When using the auction channel, interdependencies are mainly of a pooled kind. When selling through other channels sequential interdependencies may increase, because of the following developments. First, product innovations may have a system character requiring coordinated effort of several chain partners (production, logistic providers, wholesaler, retailer). Second, quality control throughout the chain demands coordination among the activities of all chain partners. Third, improving logistic efficiencies demands coordination of all chain partners. Fourth producing customized products or products in customized packaging ties producers to their customers. The quintessence of sequential interdependence is that the transaction between parties A and B is interdependent with the transaction between B and C. In other words, the grower's production activities and the trader's marketing activities are interdependent.

In sum, the changes in the grower–customer transactions with fruits and vegetables give rise to increasing safeguarding costs due to asset specificity and difficulties in performance measurement, as well as to increasing coordination costs due to a shift from pooled to sequential interdependence. As a solution to the safeguarding problem we expect to see a shift in the distribution of property rights along the chain, while as solution to the coordination problem we expect to see a shift from standardization to direct supervision as the main coordination mechanism. Can we find these shifts in the Dutch fresh-produce chains?

#### TRANSFORMATION IN DUTCH FRESH-PRODUCE CHANNELS

In the Dutch fresh-produce industry there has been a shift from the dominant auction channel (model III) to other channel models, most notably a shift from III to IV. This shift entails that growers no longer sell to wholesalers (through the auction cooperative) but have vertically integrated into wholesaling. There have been two different models of growers vertically integrating downstream in the chain. First, the traditional auction cooperatives have transformed into marketing and wholesale

cooperatives, and second, many new small marketing cooperatives have been set up by growers that terminate their membership of the auction cooperative.

The main example of growers vertically integrating downstream by taking over wholesale assets has been the establishment of The Greenery (Bijman 2002; Bijman and Hendrikse 2003). In 1996, nine out of 20 Dutch fruit and vegetable auctions merged into the new cooperative Voedingstuinbouw Nederland (VTN), and combined all assets and activities in one central marketing firm, called The Greenery BV. Cooperative VTN is the 100% shareholder of The Greenery. The goals of the new marketing cooperative were to reduce costs, increase scale of operation, add more value, enhance market orientation and improve coordination in the production and distribution chain (Bijman 2002). The next step in the transformation process was the 1998 acquisition of two fresh-produce wholesale companies. The Greenery is now by far the largest marketing cooperative for fresh produce in The Netherlands. With a turnover in 2003 of more than 1.5 billion euro, it sells about half of all vegetables produced in The Netherlands. The Greenery is a cooperative wholesale company that trades directly with major retailers in The Netherlands and abroad. It also imports fruits and vegetables, both exotic and those products that are out-of-season in The Netherlands. Its main marketing strategy is category management: supplying the full range of fruits and vegetables, year-round, to its retail clients. As part of its marketing strategy The Greenery is investing in establishing a brand name and a reputation of quality supplier. Thus, The Greenery is building up reputation assets. To protect and fully exploit these assets, it strives to have as much control over the distribution channel as possible.

At the same time that The Greenery was formed and transformed, many growers founded new marketing cooperatives. Bijman (2002) has found that 75 new grower associations and grower-owned marketing cooperatives have been established in the years 1995-2000. The goals of many of these new marketing cooperatives was to trade directly with retail customers and to build a reputation with large retailers or even consumers (for instance by establishing a brand name). Many of these new cooperatives focused on the high-quality part of the market, by selling high-quality products, customized products (mainly customized packaging) or exclusive products. As we have argued above, transactions with these products are characterized by safeguarding needs and by sequential coordination. Thus, gaining control over the main parts of the distribution chain, by vertically integrating into wholesale, is a solution to the safeguarding problem.

Thompson (1967) suggested that in case of sequential interdependence, coordination could be obtained by direct supervision. Direct supervision implies that one party has control over the interdependent transactions. In other words, the alignment between transactions  $A \rightarrow B$  and  $B \rightarrow C$  is obtained by giving one party the power to decide on the execution of both transactions. In the case of a grower-owned cooperative, control is divided between the growers and the management of the cooperative firm. Traditionally, in the cooperative auction control resided with the growers collectively. Auction management did not have much freedom to take decisions. In the new marketing cooperatives, the management of the cooperative firm has gained substantial decision-making power to regulate both quantity and quality of supplies. This shift in decision-making power applies to both strategic and

operational decisions. Already with the establishment of The Greenery, a separation of responsibilities between the association of members (VTN) and the cooperative firm (The Greenery) was introduced, giving the management of the cooperative firm more freedom to take decisions. But also on the operational side there has been a shift. For instance, transportation from the grower to the cooperative facilities has always been the responsibility of the grower himself. In 2004, The Greenery has decided to transfer this function from the growers individually to The Greenery management. By having control over the logistics of the supply as well as delivery, The Greenery is better able to coordinate these two interdependent transactions.

Also in the newly established marketing cooperatives a substantial part of control over grower-cooperative transactions is transferred to the management, in order to obtain the coordination needed to deal with sequential interdependence. As the cooperative firm takes care of the packaging and marketing (under a brand name), growers have to comply with quality and quantity restrictions set by the management.

#### CONCLUSION

In this paper we have developed a model for the study of governance structure change. Where traditional research on governance structure choice works with a small set of (discrete) governance structures, we have shifted the level of analysis to the constituent governance mechanisms. In addition, we acknowledge that both formal and informal mechanisms may provide solutions for the safeguarding and coordination problems. When the characteristics of a transaction change, for instance because of changes in market structure, public policies or technology, transaction costs related to safeguarding and coordination may rise. By choosing a proper combination of mechanisms firms may obtain the efficient governance structure needed to support and regulate the transaction. We have presented a preliminary application of the model to governance structure changes in the Dutch fresh-produce industry. This industry has gone through substantial restructuring in recent years. Traditional governance structures are no longer popular, and various new governance structures have appeared.

Both propositions presented in this paper seem to be confirmed by the developments in the Dutch fresh-produce industry. Asset specificity has increased, mainly due to the introduction of brands and the establishment of specialized packaging stations. Measurement problems have increased due to specific quality attributes, product innovation and quality guarantees. As a solution, producers have vertically integrated downstream by taking over or setting up wholesale companies. Coordination problems have increased due to the shift from pooled to sequential interdependence. As a solution, coordination mechanisms have shifted from standardization to direct supervision. The latter has been materialized by giving the management of marketing cooperatives more authority.

Our preliminary assessment of the usefulness of the model has mainly been qualitative. The next step should be a further operationalizing of the various constructs developed in this paper, and to set up a quantitative study to analyse in

more detail the relationship between changes in transaction characteristics and shifts in governance mechanisms.

## REFERENCES

- Barzel, Y., 1982. Measurement cost and the organization of markets. *Journal of Law and Economics*, 25 (1), 27-48.
- Bijman, J., 2000. Cooperatives. In: Douw, L. and Post, J. eds. *Growing strong: the development of the Dutch agricultural sector; background and prospects*. LEI, The Hague, 127-133.
- Bijman, J. and Hendrikse, G., 2003. Co-operatives in chains: institutional restructuring in the Dutch fruit and vegetables industry. *Journal on Chain and Network Science*, 3 (2), 95-107.
- Bijman, W.J.J., 2002. *Essays on agricultural co-operatives: governance structure in fruit and vegetable chains*. Proefschrift Rotterdam [[http://www.lei.wageningen-ur.nl/publicaties/PDF/2002/PS\\_XXX/PS\\_02\\_02.pdf](http://www.lei.wageningen-ur.nl/publicaties/PDF/2002/PS_XXX/PS_02_02.pdf)]
- Borgatti, S.P. and Foster, P.C., 2003. The network paradigm in organizational research: a review and typology. *Journal of Management*, 29 (6), 991-1013.
- Cheung, S.N.S., 1983. The contractual nature of the firm. *Journal of Law and Economics*, 26 (1), 1-21.
- Coase, R.H., 1937. The nature of the firm. *Economica*, 4 (16), 386-405. [[http://people.bu.edu/vaguirre/courses/bu332/nature\\_firm.pdf](http://people.bu.edu/vaguirre/courses/bu332/nature_firm.pdf)]
- Grandori, A., 1997. An organizational assessment of interfirm coordination modes. *Organization Studies*, 18 (6), 897-925.
- Granovetter, M., 1992. Problems of explanation in economic sociology. In: Nohria, N. and Eccles, R.G. eds. *Networks and organizations: structure, form, and action*. Harvard Business School Press, Boston, 25-56.
- Grossman, S.J. and Hart, O.D., 1986. The costs and benefits of ownership: a theory of vertical and lateral integration. *Journal of Political Economy*, 94 (4), 691-719.
- Gulati, R. and Singh, H., 1998. The architecture of cooperation: managing coordination costs and appropriation concerns in strategic alliances. *Administrative Science Quarterly*, 43 (4), 781-814.
- Hannan, M.T. and Freeman, J., 1989. *Organizational ecology*. Harvard University Press, Cambridge.
- Hart, O. and Moore, J., 1990. Property rights and the nature of the firm. *Journal of Political Economy*, 98 (6), 1119-1158.
- Hesterly, W.S., Liebeskind, J. and Zenger, T.R., 1990. Organizational economics: an impending revolution in organization theory. *Academy of Management Review*, 15 (3), 402-420.
- Hobbs, J.E., 2003. Institutional adaptation in the agri-food sector. In: Van Huylenbroeck, G., Verbeke, W., Lauwers, L., et al. eds. *Importance of policies and institutions for agriculture: Liber Amicorum Prof.dr.ir. Laurent Martens*. Academia Press, Gent, 57-77.
- Hobbs, J.E. and Young, L.M., 2000. Closer vertical co-ordination in agri-food supply chains. *Supply Chain Management*, 5 (3), 131-142.
- Holmström, B. and Milgrom, P., 1991. Multitask principal agent analyses: incentive contracts, asset ownership, and job design. *Journal of Law, Economics & Organization*, 7, 24-52.
- Holmström, B. and Milgrom, P., 1994. The firm as an incentive system. *American Economic Review*, 84 (4), 972-991.
- Jones, C., Hesterly, W.S. and Borgatti, S.P., 1997. A general theory of network governance: exchange conditions and social mechanisms. *Academy of Management Review*, 22 (4), 911-945.
- Kemmers, W.H., 1987. De groente- en fruitveilingen tot 1945. In: Plantenberg, P. ed. *100 jaar veilingen in de tuinbouw [1887-1987]*. Centraal Bureau van de Tuinbouwveilingen in Nederland, 11-34.
- Klein, B., Crawford, R.G. and Alchian, A.A., 1978. Vertical integration, appropriable rents, and the competitive contracting process. *Journal of Law and Economics*, 21 (2), 297-326.
- Meulenbergh, M.T.G., 1989. Horticultural auctions in The Netherlands: a transition from 'price discovery' institution to 'marketing' institution. *Journal of International Food & Agribusiness Marketing*, 1 (3/4), 139-165.
- Milgrom, P. and Roberts, J., 1992. *Economics, organization and management*. Prentice-Hall Intern., Englewood Cliffs.
- Mintzberg, H., 1979. *structuring of organizations: a synthesis of the research*. Prentice-Hall, Englewood Cliffs.



- Plantenberg, P. (ed.) 1987. *100 jaar veilingen in de tuinbouw [1887-1987]*. Centraal Bureau van de Tuinbouwveilingen in Nederland.
- Royer, J.S. and Rogers, R.T., 1998. *The industrialization of agriculture: vertical coordination in the U.S. food system*. Ashgate, Aldershot.
- Thompson, J.D., 1967. *Organizations in action: social science bases of administrative theory*, New York.
- Van Stuijvenberg, J.H., 1977. *De ontstaansgronden van de landbouwcoöperatie in her-overweging*. Nationale Cooperatieve Raad, 's-Gravenhage.
- Williamson, O.E., 1979. Transaction-cost economics: the governance of contractual relations. *Journal of Law and Economics*, 22 (2), 233-261.
- Williamson, O.E., 1987. *The economic institutions of capitalism: firms, markets, relational contracting*. Free Press, New York.
- Williamson, O.E., 1991. Comparative economic organization: the analysis of structural alternatives. *Administrative Science Quarterly*, 36, 269-296.
- Williamson, O.E., 1999. Strategy research: governance and competence perspectives. *Strategic Management Journal*, 20 (12), 1087-1108.