

Business network connection effects on relational governance:
empirical evidence of the flower sector in the Netherlands

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Competitive Paper

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Abstract

This paper discusses the influence of different network subgroups on relational governance of buyer-supplier relationship. Business networks provide valuable information that in turn reduces the information asymmetry of partners involved in a business relationship. The access to this informational advantage is studied in terms of five different network subgroups and analyzed in terms of benefits of control, production process, logistic operations and setting selling conditions. Empirical evidence was gathered through a survey on the Dutch potted plant and flower sector, where mailed questionnaires targeted suppliers and inquired about a specific relationship with a selected buyer. Based on the 173 eligible questionnaires, we found the network subgroup of other buyers and customer's of the selected buyer influencing the joint planning. We also found that relational governance influences positively the performance of the focal relationship and the supplier's growth rate. Our conclusion addresses some theoretical implications to the study of buyer-supplier relationship and the influence of individual network subgroups as well as suggestions for further research.

Keywords: Business networks, Relational governance, Buyer-supplier relationship, Network subgroups, Flower supply chain

Introduction

Research has demonstrated that a dyadic relationship does not develop in isolation from other relationships of the two parties (Hakansson and Snehota, 1995). This is because an exchange relationship between two firms is conditioned by their relationships with other actors. The business relationship should therefore be considered within its context of business network connections (Anderson, Hakansson and Johanson, 1994). This business network connection is significant for relational governance, as the connections may reduce transaction costs through diligent flows of information that in turn minimize information asymmetry and mitigate opportunistic behavior. Therefore, the intensity of network connection influences the business relationship and guides managerial choices as it indicates both possibilities and limitations.

In this paper, we propose that considering business network allows a more refined understanding of supply chain coordination — since chain participants can be seen as embedded in networks that offer informational advantages. Our thoughts and the studies that highlight the role of embeddedness (e.g. Granovetter, 1985) do not contradict the economic motivations for buyer-supplier relationships. Firms do not form these relationships as symbolic social affirmations of their business network but, rather, base relationships on concrete long-term strategic goals. It does suggest that the conditions of mutual economic advantage are necessary but not sufficient for buyer-supplier relationships between two firms. The economic advantages of a relationship are not only related to reduction in production costs but also reduction in transaction costs. The primary benefit of business networks is the great possibilities for firms to gather superior information about each other through their network connections (Gulati, 1999; Burt, 1997), which in turn influences the design of the relationship governance and, consequently, reduce transaction costs. We argue that the intensity of a company's network connections affect successful governance of a business relationship.

In doing so, this paper aims to discuss the influence of network connections on successful relational modes of governance. Empirical evidence was gathered through a survey on the Dutch potted plant and flower sectors, where mailed questionnaires targeted growers of potted plants and flowers (called suppliers throughout the paper). Questions were about the relationships that the suppliers were having with a merchant-distributor that was selected

during the questionnaire. In addition, questions were addressed to suppliers about the influence of the network connections on the relationship with the selected buyer. This data was gathered in order to support the theoretical elaboration.

The paper is divided into six main sections. First, the affect of business network is discussed in the line of transaction cost reasoning. We elaborate the informational benefit of networks and the implications to the economic transactions. Second, relational governance is elaborated in terms of joint planning, flexibility of adjustments and shared problem solving. Third, hypotheses of the influence of network connection on relational governance are discussed based on the different network subgroup. Fourth, the hypotheses of the impact of relational governance on the performance of buyer-supplier relationships are developed. In the fifth section is presented the research design, the measurement instruments and details of the data collection. Finally, the results are discussed and concluding remarks highlights the main findings.

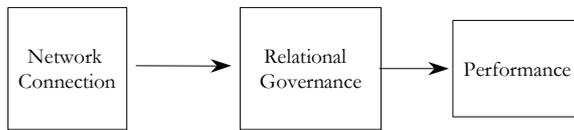
Rationale

The literature on inter-organizational relationships has been based on the theory of transaction cost economics (TCE) (for a review see Rindfleish and Heide, 1997). For TCE, the costs of a transaction are distinguished between ex ante and ex post costs. While the ex ante costs refer to expenditures to delineate, negotiate and safeguard a transactional agreement, the ex post costs refer to the costs of monitoring and enforcing the same agreement (Williamson, 1985). These transaction costs affect the type of governance a company may choose to coordinate a transaction. Criticism has been addressed to TCE when the focus of the analysis is relational governance (Menard, 1998; Dyer and Singh, 1998) and when the business network plays a role (Jarillo, 1988; Powell, 1990; Gulati, 1995). The bases for discussions lie on the adoption of a wrong view of human nature and neglecting the role of social relationships in economic transactions. One of the behavioral assumption of TCE, which is the center of discussion in this paper, is information asymmetry. TCE Scholars assume that some individuals involved in a transaction hold more information than others, considering, for instance, market imperfections, inefficient information flows and position in a business network. This hampers the ability to foresee future actions of other individuals, and, consequently, there is room for opportunistic behavior. Because of information asymmetry, individuals can not solve problems instantaneously or anticipate all possible future events, nor can they always devise and effectively communicate appropriate responses to contingencies they do foresee. This assumption argues that asymmetric information give rise to transaction costs, which means misaligned incentives, requirements for description of the impediments to reach and enforce agreements. Therefore, the rationale of this paper is to tackle the information asymmetry by means of analyzing the informational advantages of business networks.

The companies, which have business relationships embedded in a business network and employ relational governance, are likely to be efficient in their transactions. Based on this circumstance, the advantages are defined into four points: (1) adaptation requires less documents, (2) resolving internal disputes by fiat rather than arbitration saves resources and time, (3) valuable information – that is deeply impacted – can more easily be accessed and more accurately assessed, (4) internal dispute resolution enjoys the support of informal organization, (5) incentives instruments promotes team orientation (Williamson, 1991). The referred advantages promote not only performance, in the sense of reducing – ex ante and ex post – transaction costs, but also coordination, in terms of joint actions between the involved companies. Therefore, a study of the affect of business networks on relational governance and

the performance is relevant and will be explored in the next sections. Figure 1 presents a simple diagram about the theoretical discussion proposed by this paper.

Figure 1: Theoretical framework



Relational governance

Prior research on the governance structure has been heavily influenced by transaction cost economists who emphasize the contracting hazards inherent in any transaction (Williamson, 1985). According to this view, hierarchical governance structures should be favored when opportunism is likely and transaction costs are high. Market exchange should be preferred when contracts are readily written and enforced and transaction costs are low. If we extend this for relational governance, then these business relationships make sense in more intermediate situations where transaction costs are not so severe as to require total hierarchical control and are not so low as to enable market-based exchange.

Relational governance reflects the degree to which relational norms and processes are established in a buyer-supplier relationship that enable a collaborative mode of relationship (Heide and John, 1992; Bensaou and Venkatraman, 1995). In other words, relational governance refers to the extent to which the two parties of a buyer-supplier relationship undertake activities jointly rather than unilaterally (Heide, 1994; Zaheer and Venkatraman, 1995). Three partially overlapping dimensions have been used commonly to reflect the degree of relationism: joint planning, flexibility of adjustments and shared problem solving.

Joint Planning refers to the extent to which future contingencies and consequential duties and responsibilities in a relationship have been made explicitly ex-ante (Heide and John, 1990 and Heide and John, 1992). When a partner's actions influence the ability of the other to effectively compete, the need for jointly setting goals, long-term plans, responsibilities and expectations increases. Dwyer, Schurr and Oh (1987) suggest that input to decisions and goal formulation are important aspects of joint planning that improve relationships performance. Joint planning allows mutual expectations to be established and cooperative efforts to be specified.

In the minds of managers, when dealing with business relationships, Shared Problem Solving refers to the extent to which recent disagreements with a partner have been productively resolved (Lush and Brown, 1996; Heide and Miner, 1992). In this respect, companies involved with business relationships are motivated to engage in shared problem solving. Suppliers and buyers are linked in order to manage an environment that is more turbulent than each alone can cope with (Cummings, 1984) and integrative outcomes satisfy more fully the needs and concerns of both parties (Mohr and Spekman, 1994). Through shared solving problems, a mutually satisfactory solution may be reached and, consequently, relationship success.

Flexibility of Adjustments refers to the extent to which parties' expected flexibility has been in response to changing circumstances (Heide, 1994). Flexibility defines a bilateral expectation of willingness to make adaptations as circumstances change. From a supplier's perspective, it represents insurance that the relationship will be subject to good-faith modification if a particular practice proves detrimental in the light of changed circumstances.

These three dimensions serve as safeguard for transaction specific investments since firms that invested in relationships with others would like to reduce the risk of opportunism by being involved in relational governance (Heide and John, 1990). The bottom line is that the flexibility and the joint responsibility for the activities of a specific buyer-supplier relationship may be affected by the information available in the business network. This information supports companies not only in terms of having a good deal of information about, for instance, the new technologies but also controlling future actions of partners and accessing market information.

Quite obviously, any buyer-supplier relationships are complex organizational arrangements that can require multiple levels of internal approval, search issues in identifying partners, and detailed negotiations and sometimes contracts (Claro, Hagelaar and Zylbersztajn, 2002). However, the mutually reinforcing safeguards of networks can decrease the contracting and transaction costs associated with any specific exchange relationship and potentially enhance the returns that both partners can extract from their relationship. In sum, network perspective presupposes that economic actions (i.e. transactions) are influenced by the social context in which companies are embedded, and those actions are more likely to be influenced by the network (Powell, 1990).

Network connections as an antecedent of relational governance

We define the network connection as the degree to which business in a focal relationship is contingent on business in other connected relationships (Cook and Emerson, 1978, p.725). Relationships are connected in the sense that the information exchange in one relationship is dependent on the information exchange in the other. There may be innumerable connections that provide benefits to a given focal relationship (Ritter, 2000). In this paper the contingence refers to the relevant benefit of network connections: valuable information (Gulati, 1995; Hakansson and Snehota, 1995; Burt, 1997; Blankenburg, Eriksson and Johanson, 1999). The dimensions of network connections comprise of activities of control (Burt, 1997; Williamson, 1985), coordination of the production process (Hakansson and Snehota, 1995; Hakansson, Havila and Pedersen, 2000), coordination of logistics (Gadde and Snehota, 2000), and setting selling conditions (Boer, 1998; Wathne, Biong and Heide, 2001). These four benefits are analytically distinct but also overlap, since much of the control benefit can arise from the coordination of processes and logistics (Gadde and Snehota, 2000).

There is an expected impact of informational advantages on the relational governance of a focal buyer-supplier relationship. First, the information about production process improves internal efficiencies and product development which in turn promote integration of activities with a partners and more joint actions. Second, information about logistic operations allows better planning of the distribution of products which in turn promote deliveries in time and tracking and tracing activities of partners involved. Third, information about setting selling conditions improves the accuracy on determining for instance price and quantities of products to be sold to a specific purchaser. This promotes a safeguard to companies that in turn are more willing to be flexible in adjustments as well as plan and solve problems together with the partner. Finally, accessing information about the future and past actions of a partner supports the control mechanism, which in turn creates an atmosphere to jointly deploy activities. In sum, the informational advantages of a business network provide a context in which incentives for coordination and collaboration enables joint actions and flexibility of adjustments.

The combination of the benefits of networks results into the intensity of the informational advantage of network connections (Granovetter, 1973; Burt, 1992; Gulati, Nohria and Zaheer, 2001). This analytical approach for examining the influence of network connections emphasizes the differential informational advantages conferred by

distinct network connections. Network connection intensity then stresses the role of direct cohesive connections as a dimension expressing the gains of valuable information. Network partners who intense access their connections with different companies or organizations are likely to possess more common information and knowledge, which in turn supports managing individual business relationships.

The study of a specific company's business network needs a careful delimitation of the relevant connected relationships. Connected relationships may add up in various ways to a business network and more importantly offer a support to a focal relationship through the informational advantages. For Burt (1980), the unit of analysis of networks is based on the degree of actor aggregation, which encompasses three different levels: actors, network subgroups and subgroups as a structured system. Several studies on network focused on three companies (Ford, 1990), others considered the network as a whole (Gulati, 1995). In this paper, we decided to focus on the network subgroups in order to identify the individual role of each subgroup. A network subgroup consists of a group of companies with the same function in the market, for instance, network subgroup of customers or network subgroup of primary suppliers. Since the different network subgroups are identified based on a chain perspective, the strength and the direction of the support to a focal relationship is at the heart of the analysis. For instance, while the network subgroup of early suppliers could be a reliable source of information about product development and efficient production processes, the network subgroup of other buyers could be a reliable source of information about new trends and specific consumer requirements. Therefore, network connection comprises of a collection of the intensity of informational advantages that supports a focal relationship assessed by the individual network subgroups.

In considering the informational advantages of business network connections, we develop three hypotheses of the influence of these advantages on relational governance. The elaboration above shows strong reasons to consider different network subgroups in order to capture the effects of network connections on a focal buyer-supplier relationship. The more a company accesses reliable information from other network members that supports the focal relationship, the more they will engage in relationships featured by joint planning, shared problem solving and flexibility of adjustments. We expect that the more the network connection intensity is, the more relational the governance will be, in terms of the three dimensions. Thus we formulate the following hypotheses:

H1: Intense network connections are related to high levels of joint planning.

H2: Intense network connections are related to high levels of shared problem solving.

H3: Intense network connections are related to high levels of flexibility of adjustments.

Relational Governance and Performance

The reasoning behind relational governance and performance is based on the reduction of transaction costs. Joint planning reduces the risk of unexpected problems which in turn reduce the need for a sophisticated monitoring apparatus. Additionally, joint planning coordinates companies to promptly answer to steps of a strategic plan, which minimizes wasting of time and resources. Shared problem solving allows for creative forms of dealing with disagreements and other contingencies of relationships, which reduce the transaction costs and, consequently, improve performance. Since disagreements are a natural aspect of business relationships, the flexibility of adjustments results in less costly procedural or structural adjustments in a near future disagreement. In this regard, the joint actions allows companies to draw reasonably attention to their core business due to a smoothly pace of a business relationship, which means in less distractions to solve problems alone or revise a strategic plan that did not

consider contingencies of a partner. In addition, with relational governance there is no explicit need for formal written contracts, it is possible to predict in advance or jointly solve a problem. Therefore, the time and energy so often spent on trying to plan alone, work out problems without consulting a partner and being inflexible on adjustments are related waste and, certainly, decrease overall performance.

The more a company engages in relationships featured by joint planning, shared problem solving and flexibility of adjustments, the more they will achieve high performance. We expect that high degree of the three dimensions of relational governance lead to high levels of perceived satisfaction and growth rate. Thus we formulate the following hypotheses:

H4: High degree of relational governance is related to high levels of perceived satisfaction.

H5: High degree of relational governance is related to high levels of growth rate.

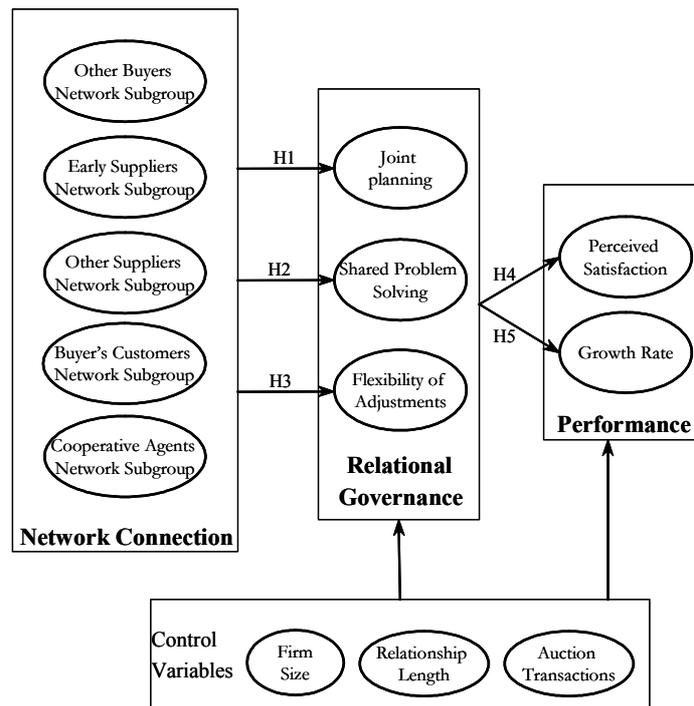
Control variables

Interviews with experts and previous research suggested that relational governance and performance might vary by firm size as well as relationship length and the amount of auction transactions. For instance, *the length of a relationship* might influence the behavior of companies in terms of relational governance. In other words, older relationships are more familiar and comfortable, adjustments and shared solving problems have been experienced (Anderson and Weitz, 1989). *Auction transactions* are transactions that occur in the Auction Cooperatives by means to the auction clock. Basically, the auction clock works on the price reduction principle (Dutch auction), whereby the price goes downwards and the product is sold to the first buyer merchant to respond. A massive standardization of products in combination with market forces and price set mechanism comprise the factors that determine transaction partners in this market-based transaction. Regarding *firm size*, it is reasonable to suppose that larger firms have become so by virtue of achievement, which suggests that a generalized intention to replace standardized auction transactions by relationships with relational governance. The gains with coordination and the possibility to plan in advance with a specific supplier confer enough reasons to achieve performance.

Accordingly, we included three control variables in order to evaluate the variability of each regression model.

Although we do not develop specific hypotheses to every control variable, it is expected that firm size and relationship length will be related positively to both relational governance and performance. Additionally, we expect that auction transactions will be related negatively to both relational governance and performance. The detailed research model of this paper is shown in figure 2.

Figure 2: Research Model



Research Design

Research context

The two major hypotheses of the whole theoretical discussion are supported by data on buyer-supplier relationships of a survey with suppliers (growers of potted plants and flowers) and merchant-distributor in the Netherlands. The Dutch flower sector is one of the booming agribusiness sectors in the Netherlands. The significance of this sector in the world is beyond doubt, in fact, the auction cooperatives in the Netherlands handles around 65 per cent of the total world flower production (Elshof, 1998). In order to focus the study, a specific interface of the flower chain was selected, namely the business relationships between suppliers and merchant-distributors. This interface was chosen because of the significant number of both chain participants that are replacing market-based relationships with suppliers by buyer-supplier relationship. The effects are tangible, at the Aalsmeer Auction around 50 per cent of the total sales of potted plants and potted flowers were sold via buyer-supplier relationship instead of the traditional market-based relationships: the auction clock (Kalenzi, 2000).

Data Collection

On the basis of literature search and previous case studies (Claro, Hagelaar and Zylbersztajn, 2002; Claro, Hagelaar and Omta, 2002; Claro and Hagelaar, 2002), we developed a survey instrument. A panel with three academic experts was asked to evaluate the items, after which two practitioners were asked to give comments on the items. We then conducted a pretest on five different flower suppliers in which managers and owners were asked to fill out the questionnaire and raise questions as problems and ambiguities arose. This information was used to improve several of the questions and scales further.

Attempting to minimize response bias, we seek to identify the knowledgeable informant. As a great number of suppliers are owner-managed, we choose the owner as our only informant since no other person has the vantage point of providing the data relevant for this study (Venkatraman and Grant, 1986; Zaheer and Venkatraman, 1995).

In the case of suppliers with more functional structure, we target the person more acquainted with the sales department.

When responding all questions about the relationship and business network connection (see figure 2), respondents are asked to consider their relationship with the most active (i.e. largest number of transactions) buyer through the mediation department of the auction cooperatives.

The sample of 598 companies was based on a list of suppliers of potted plants/flowers, which are very active in sales through the mediation department of the auction cooperatives. Foreign companies and duplicated addresses were excluded of the address list, which resulted in a sample size of 571 companies. All the companies received by mail a package containing an introduction letter, questionnaire and a return paid envelope. After one month a follow-up attempt was carried out with the companies which had not yet responded. A new package was mailed with a new introduction letter to remind the relevance of the study. Our data collection effort yielded 201 responses, of which 28 were incomplete questionnaires and other non-eligible companies. The effective response rate of 31% compares favorably with those obtained in prior research in this field. Of the 173 usable responses, 124 were received in the first wave.

Furthermore, test for non-response bias was tested according to the extrapolation method which is based on the assumption that companies who respond less readily are more likely to be non-respondents (Armstrong and Overton, 1977). In this regard, a mean comparison of early respondents versus late respondents on two constructs (firm size and relationship length) yielded no significant differences. Therefore, non-response bias does not appear to be a serious problem in our study.

Measures

Exploratory factor analysis and an examination of the item intercorrelations were used to purify the scales. All the measures used in the study are reported in table 1 as well as the Crombach's alpha for the measures.

Table 1: Example of the multi-item scales

Relationship Performance

Perceived satisfaction $\alpha = .86$ (6 items, 7-point Likert scale, "very unsatisfied–very satisfied")

1. The order frequency over the year.
2. Prices paid by the selected buyer for our products.

Relational Governance:

Joint Planning $\alpha = .70$ (4 items, 7-point Likert scale, "not at all–very much")

1. Our company plans volume demands for the next seasons together with this buyer.
2. Our company plans the new products and varieties demands for the next seasons together with this buyer.

Flexibility of adjustments $\alpha = .60$ (2 items, 7-point Likert scale, "not at all–very much")

1. Our company is flexible in response to changes in the relationship with this buyer.
2. When some unexpected situation arises, this buyer and our company work out a new deal.

Shared Problem solving $\alpha = .87$ (4 items, 7-point Likert scale, "not at all–very much")

1. This buyer and our company deal with problems that arise in the course of the relationship together.
2. This buyer and our company do not mind owing each other favors.

Network connection (same items to all network subgroups)

Other buyers network subgroup $\alpha = .84$ (4 items, 7- point Likert scale, "not at all–very much")

Early suppliers network subgroup $\alpha = .89$ (4 items, 7- point Likert scale, "not at all–very much")

Other potted plant suppliers network subgroup $\alpha = .81$ (4 items, 7- point Likert scale, "not at all–very much")

Buyer's customer network subgroup $\alpha = .95$ (4 items, 7- point Likert scale, "not at all–very much")

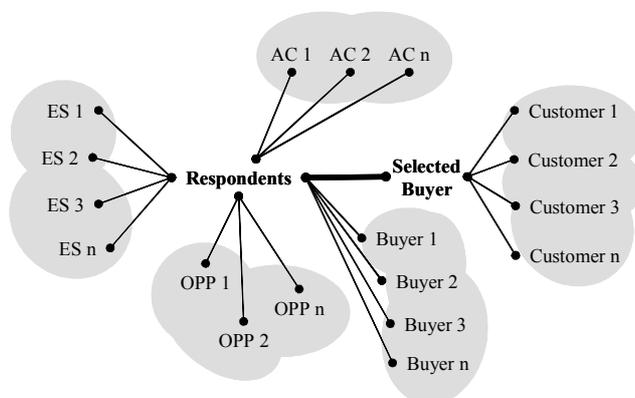
Agents of the cooperative network subgroup $\alpha = .91$ (4 items, 7- point Likert scale, "not at all–very much")

1. I get reliable information from other buyers, which supports me in defining prices of products for the selected buyer.
 2. I get reliable information from other buyers, which supports me to foresee future actions of the selected buyer.
-

Performance was assessed through two measures. First, the perceived satisfaction measurement refers to the exact rating of respondent's perceived satisfaction on its selected buyer. This measurement instrument was adapted from previous study (Zaheer, Mcevely and Perrone, 1998; Bensaou and Venkatraman, 1995). Six 7-point Likert scale items constitute its final scale, and $\alpha = .86$. Second, sales growth rate consists of an objective measurement of performance, which refer to the development of sales volume over the last three years (adapted Mohr and Speckman, 1994).

A measurement instrument was developed to *network connection*, which is measured by five items to each network subgroups. Network sub-group is a set of organizations holding the same function in the market – perceived by the respondent. The subgroups inquired by this research are early suppliers, other buyers, other supplier of potted plant products, buyer's customers and agents the auction cooperatives (see figure 3). The network subgroup of early suppliers is composed by supplier of young plants and seeds, companies that supply fertilizers, chemical products, pots, vases, wood and other raw materials. The network subgroup of other buyers is composed by wholesalers, flower exporters, cash and carries and garden centers. The network subgroup of other potted plant supplier is composed by companies with similar products of the respondents that might be either a colleague or a direct competitor. The network subgroup of buyer's customers is composed by supermarkets, flower shops and wholesalers abroad. The network subgroup of agents of the auction cooperative is composed by the agents of the mediation department of the auction cooperatives in the Netherlands. Previous studies inquired about the extent to which a certain subgroup would generally affect the relationship with a focal company (Anderson, Hakansson and Johanson, 1994 and Blankenburg, Eriksson and Johanson, 1999). We then decided to develop five items to each network subgroup considering the informational advantages (Burt, 1997) offered by connections with the subgroups. The items are with regard to the support for setting prices, setting quantities, production process, logistic operations, and foreseeing future actions of the focal buyer. In order to capture the influence of network connections, a seven-point Likert scale ranging from "not at all" to "very much" was used. The network connection intensity is estimated based on the average of the items from each network subgroup. The Crombach's alpha and the referred items are displayed in table 1. These multi-items measures were subjected to an exploratory factor analysis with varimax rotation to verify unidimensionality.

Figure 3: Network subgroups



Note: AC: Agents of the auction cooperative; ES: Early suppliers; OPP: Other potted plant suppliers.

The measurement instrument developed to *relational governance* is based on the joint actions performed by the respondent and its selected buyer. This instrument describes the extent to which the parties undertake activities jointly rather than unilaterally (Heide, 1994; Zaheer and Venkatraman, 1995). Relational governance was assessed by three constructs. Joint Planning is meant to measure the extent to which future contingencies and consequential duties and responsibilities in a relationship have been made explicitly ex-ante (Heide and John, 1990 and Heide and John, 1992). This construct was measured by 4 items with Likert scale, and alpha = .70. Flexibility of adjustments is a set of items describing the parties' expected flexibility in response to changing circumstances (Heide, 1994). This construct was measured by 2 items with Likert scale, and alpha = .60. Shared problem solving refers to the behavior to the relationships that captures the degree of joint solutions to problems a supplier demonstrates toward the selected buyer (Lush and Brown, 1996; Heide and Miner, 1992). This construct was measured by 4 items with Likert scale, and alpha = .87.

Three measures were used to evaluate the variance of the control variables. First, the variable *firm size* was measured based on the annual sales of potted plants in the year 2001. Second, the *relationship length* was measured through an open ended question about the time that the respondent is doing business with the selected buyer. Third, the variable *auction transactions* reflects the percentage of sales through the auction clock of the Dutch cooperatives.

The correlation matrix for all the measures is presented in table 2.

Table 2: Descriptive statistics

	Mean	S.D.	PS	GR	JP	SPS	FA	OBNS	ESNS	PSNS	BCNS	CANS	FS	RL	AT
Perceived															
Satisfaction (PS)	5.27	0.99	172												
Growth Rate (GR)	9.20	15.22	0.14	165											
Joint Planning (JP)	2.86	1.37	0.225**	0.158*	173										
Shared Problem Solving (SPS)	5.63	1.36	0.467**	0.194*	0.287*	173									
Flexibility of adjustments (FA)	4.92	1.58	0.375**	0.227**	0.428**	0.534**	173								
Other Buyers Network Subgroup (OBNS)	2.90	1.40	0.154*	-0.086	0.342**	0.184*	0.21**	173							
Early Suppliers Network Subgroup (ESNS)	2.47	1.38	0.014	-0.104	0.293**	0.044	0.082	0.438**	172						
Potted plant Suppliers Network Subgroup (PSNS)	2.65	1.47	-0.065	-0.063	0.237**	0.059	0.083	0.427**	0.264**	173					
Buyer's Customers Network Subgroup (BCNS)	2.72	1.73	0.151*	-0.003	0.341**	0.19*	0.185*	0.41**	0.384**	0.266**	171				
Cooperative Agents Network Subgroup (CANS)	3.10	1.55	-0.225**	0.056	0.01	-0.088	-0.038	0.095	0.029	0.222**	-0.05	173			
Firm Size (FS)	1.57	0.5	0.188	0.099	0.278**	0.317**	0.249**	0.153*	0.182*	-0.008	0.207	-0.072	173		
Relationship Length (RL)	8.43	5.6	0.131	-0.175*	-0.058	0.138	0.079	0.022	-0.045	-0.071	-0.078	-0.027	0.088	173	
Auction Transactions (AT)	34.12	22.15	-0.378**	0.047	-0.159*	-0.308**	-0.208**	-0.215**	-0.106	0.038	-0.275**	0.141	-0.119	-0.181**	172

Note: coefficient of Pearson Correlation significant at *p<0.05 and **p<0.01; figures on the diagonal represent number of observations.

The hypotheses were tested by estimating an ordinary least squares regression model in the sample with backward method. Backward is a selection method that allows specifying how independent variables are entered into the analysis. Backward variable elimination enters all of the variables in the block in a single step and then removes them one at a time based on removal criterion (p<.10). The first model involved regressing the joint

planning, shared problem solving, flexibility of adjustments and four control variables against the five independent variables, network variables. The second model involved regressing joint planning, shared problem solving, flexibility of adjustments and four control variables on the two performance measures. The results of the full model estimation are displayed in table 3.

Results and Discussion

The first three hypotheses of the model in figure 2 were tested through regression procedure based on three equations. The results of the analysis of network subgroups and relational governance are provided in table 3. These three regressions test the hypotheses that network connections, which were identified into five different network subgroups, affect positively the relational governance of a company.

Table 3: Results of the regression analysis of network subgroups and relational governance

	Joint Planning	Shared Problem Solving	Flexibility of adjustments
Other Buyers Network Subgroup	.221*** (2.880)	.135* (1.701)	.144* (1.678)
Early Suppliers Network Subgroup	-	-0.090 (1.139)	-0.073 (.863)
Potted plant Suppliers Network Subgroup	-	-	-
Buyer's Customers Network Subgroup	.205*** (2.651)	-	.060 (.707)
Cooperative Agents Network Subgroup	-	-	-
Firm Size	.190*** (2.653)	.291*** (4.065)	.208*** (2.753)
Relationship Length	-	.073 (1.025)	-
Auction Transactions	-	-.246*** (3.377)	-.160** (2.072)
R²	0.190	0.203	0.121
Adjusted R²	0.176	0.179	0.094

***p<0.01, **p<0.05, *p<0.10

Notes: Regression coefficients are standardized coefficients (β) and |t-test| within parentheses; dashes refer to excluded independent variables.

Joint planning. A supplier's action of planning together with the selected buyer was found to be significantly related to the connections with the network subgroup of other buyers ($\beta=.221$, $p<.01$) and the network subgroup of the buyer's customers. This result is according to the predicted direction. However, the other network subgroups were not significantly related to joint action, as predicted by our hypotheses. Firm size found to be significantly related to the joint actions ($\beta=.190$, $p<.01$) and the direction is fairly expected by previous studies (Antia and Frazier, 2001; Claro, Hagelaar and Zylbersztajn, 2001).

Shared problem solving. A supplier's action of solving problems together with the selected buyer was found to be significantly related with the connections with the network subgroup of other buyers ($\beta=.135$, $p<.10$). On the other hand, no significant relations were found between shared problem solving and the other network subgroups.

Additionally, the effect of firm size and auction transactions on shared problem solving was significantly related ($\beta=.291$, $p<.01$ and $\beta=-.246$, $p<.01$ respectively).

Flexibility of adjustments. The connections with the network subgroup of buyers affects the flexibility of adjustments in a relationship with the selected buyer ($\beta=.144$, $p<.10$) but the other network subgroups did not show significant relation with flexibility of adjustments. Finally, the effect of firm size and auction transactions on flexibility of adjustments was significantly related ($\beta=.208$, $p<.01$ and $\beta=-.160$, $p<.05$ respectively).

The hypotheses four and five of the model in figure 2 were tested through regression procedure. The results of the analysis of relational governance and performance are shown in table 4. These two regressions test that the relational governance, in terms of joint planning flexibility of adjustments and shared problem solving, affect positively the performance of a company.

Table 4: Results of the regression analysis of performance and relational governance

	Perceived Satisfaction	Growth Rate
Joint Planning	-	-
Flexibility of Adjustments	.316*** (3.978)	.159* (1.765)
Shared Problem Solving	.145* (1.873)	.171* (1.830)
Firm Size	-	-
Relationship Length	-	-.197** (2.552)
Auction Transactions	-.245*** (3.575)	.097 (1.204)
R2	0.296	0.110
Adjusted R2	0.283	0.087

*** $p<.01$, ** $p<.05$, * $p<.10$

Notes: Regression coefficients are standardized coefficients (β) and $|t\text{-test}|$ within parentheses

Perceived satisfaction. The respondent's flexibility to adjustments in the relationship with the selected buyer affects the perceived satisfaction ($\beta=.316$, $p<.01$). In addition, the perceived satisfaction was significantly related to shared problem solving ($\beta=.145$, $p<.10$) and no relation was found between joint planning and performance. On the other hand, perceived satisfaction was found to be significantly related to auction transactions ($\beta=-.245$, $p<.01$). This result shows the negative effect of auction transaction on perceived satisfaction.

Growth rate. The growth rate was found to be significantly related to flexibility of adjustments ($\beta=.159$, $p<.10$) and shared problem solving ($\beta=.171$, $p<.10$) but not related to joint planning. Though relationship length has a significant effect on growth rate ($\beta=-.197$, $p<.05$), the result was opposite the predicted direction. This means that not so long relationships (i.e. noteworthy the average was 8.5 years and standard deviation 5.6 years) are related to companies that presented high growth rate. One explanation for such finding has to do with the replacement of small buyers by large buyers in order to maintain a relationship with a buyer that is capable of purchasing more quantities. Finally, growth rate was found to be non-significantly related to auction transactions and no relation was found with joint planning and firm size.

Concluding Remarks

The results from this study show interesting causal relations between the individual subgroups of business networks and relational governance of buyer-supplier relationships. The results support partially the hypotheses of the framework in figure 2. It generally suggests that the studies on relational governance should consider carefully the implications of individual network subgroups on various joint actions between two specified partners in a business relationship. The first hypothesis is explained by the influence of the network subgroups of other buyers and buyer's customers on joint planning. The second and third hypotheses are explained by the effect of network subgroup of the other buyers on the shared problem solving and the flexibility of adjustments. This supports our discussion of business networks influencing the lack of information proposed by transaction cost economists. The monitoring and enforcement of an agreement allows suppliers to move from a market based transactions to a more sophisticated mode of governance, as relational governance, without additional transaction costs or loss of performance. The models presented in table 3 shows the role of network subgroups when companies employ relational governance.

The novel analysis of business network through different network subgroups showed that there are individual influences on the relational governance. The information from other buyer network subgroup supports the strategic plans that are developed together with the selected buyer. This result expresses the important position of merchant-distributors in the market, which allows them to gather reliable information from other members of the whole business network. In addition, the strategic plans are supported by information that comes over from the buyer's customers network subgroup. These two influences clearly show the tendency of gathering information upstream in the supply chain. Interestingly, suppliers are accessing network subgroups that are positioned close to the end consumers, which might enable gathering accurate and prompt information further up the chain. Although, the focal relationship is demand orientated, all the other network subgroups were mentioned and were similarly highlighted. Therefore, suppliers are accessing reliable information to support the relationships with buyers from other buyers and buyer's customers more than any other inquired network subgroup.

Another reason to conclude that business network provide access to reliable information is that suppliers, which are sharing solving problems and are flexible when adjusting to contingencies, are selling less via market-based transactions (i.e. auction transactions). The need for a third party on transactions is replaced by relational governance which in turn becomes more successful then market-based transactions (see table 4). As a matter of fact, suppliers preferred to rely on ongoing relationships with relational governance rather than on the market forces of market-based transactions.

The performance of the buyer-supplier relationship, in terms of both inquired dimensions (i.e. perceived satisfaction and growth rate), is significantly influenced by flexibility of adjustments and shared problem solving. This leads us to conclude that suppliers, which are solving problems in combination with the selected buyer and are flexible, in adjusting to any contingency, are more likely to be efficient and achieve high performance than the other suppliers that do not have such an orientation towards relational governance. Surprisingly, joint planning is not significant in the models of performance. This might be due to the fact that joint planning is not a common practice, based on the low mean of the variable (see table 2), which gives some statistical clues to explain why it was not possible to capture the variance of such a variable. This implies that companies prefer more reactive relational governance, in the sense of joint solving problems and flexibility of adjustments, than a proactive relational governance where investments would be necessary to the plan together with the selected buyer.

Although the discussion of this paper was focused on the supplier's perspective, we recognize that further research on the influence of business network, and primarily network subgroups, on relational governance should aim at the analysis of the two sides (supplier and buyer) of the relationship. Additionally, the theoretical discussion could include other relevant variables such as trust and asset specificity. Research in this field can certainly give rise to new insights into the explanatory power of business relationships by means of transaction cost economics and business network approach.

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