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Buyer–supplier relationship's influence on traceability implementation in the vegetable industry

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Abstract

The increasing importance of food safety has made traceability a crucial issue in the agri-business industry. In this article, we have analysed the factors that shape buyer–supplier relationships, and how they influence the traceability of raw materials. In order to do so, first, we have reviewed the literature to develop an analytical framework. Next, we have carried out four case studies on vegetable firms with the purpose of uncovering the variables that characterise buyer–supplier relationships, and their influence on traceability in this sector. Finally, we have compared the observed links with the conceptual framework derived from the literature in order to build an improved model.
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1. Introduction

In the food industry, products to be consumed must be free of any kind of hazards for consumers' health. Traceability is the registering and tracking of parts, processes, and materials used in production (Cox et al., 2002). In this sense, traceability becomes an indispensable process to prevent consumer's hazards and a crucial mechanism to assure quality in food firms. As of January 2005, European Union authorities require that food firms ensure quality by tracing all products in all stages, from the supplier all the way to the end consumer.

Traceability is a mechanism that requires and reinforces a maximum level of co-ordination between firms and suppliers, and between firms and retailers. Therefore, for researchers interested in the supply chain literature, traceability in food industries may become a relevant aspect to study.

The main objective of this article is to determine how the variables that shape the buyer–supplier relationship influence the implementation of traceability of raw materials in the specific case of vegetable firms. The paper is organised in four sections. In section two, we have carried out an extensive literature review on buyer–supplier relationships in different industries in order to derive an analytical framework. In the third section, the methodology employed in this project is described. We have conducted in-depth case studies in four vegetable firms. Cases are described in the fourth section. Then, in section five, we have analysed the data contained in the cases, and have isolated those variables that determine buyer–supplier relationships in the vegetable industry and its influence on traceability implementation. Finally, we sum up our conclusions, presenting an improved model, and ideas for further research.

2. Literature review

With the review of the literature, our intention has been twofold. On the one hand, to find out those variables, previously studied, that influence the relationships between buyers and suppliers in order to establish a general framework; and on the other hand, to examine what has been studied regarding traceability as a management tool.

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2.1. Buyer–supplier relationships

There are several examples of research on the variables that influence the characteristics of the relationship between supplier–buyer in the supply chain literature, as shown in the literature reviews carried out by Croom et al. (2000), and Alfaro et al. (2002). For our purpose, we have selected several references, whose objectives and methodological profiles are summarised in Table 1. These articles have allowed us to identify 13 variables, which have being clustered into three factors, as described in Fig. 1. The factors are supplier-specific, firm-specific, and competitive environment.

From the *supplier* side, González Benito et al. (2003) hypothesised that the larger the company, measured in number of employees, the greater its implementation of supplier quality assurance practices in the Spanish automobile industry. In terms of internationalisation, González Benito et al. (2003) found that the degree of internationalisation was a significant variable: those companies with a global presence were particularly concerned about quality assurance. Ragatz et al. (1997) found that top management commitment was a variable that positively influenced the success of supplier integration, and defined it as a relationship structuring driver in a number of different industries. Zigger and Trienekens (1999) also emphasised the involvement of all management levels as a key factor to determine successful partnerships in the food industry. With respect to strategy, González-Benito et al. (2003) found that quality-oriented strategies eased the development and success of buyer–supplier relationships. Finally, the characteristics of supplies was found to be an important variable by Ziggers and Trienekens (1999), who affirmed that the variability of supplies in the food sector, for instance seasonality or biological variations, influenced buyer–supplier relationships. González-Benito et al. (2003) claimed that the technological complexity of supplies also influenced supply relationships.

We have found that some of the variables that are important from the suppliers' perspective are also relevant for buyers. On strategy, Carter et al. (1998) found that firms with quality oriented strategies implemented supply relationships with a higher degree of success. Ziggers and Trienekens (1999) showed that perishability and seasonality of final products are important elements. Kekre et al. (1995) added the breadth of line as a variable that influences the complexity and the uncertainty in supplier–buyer relationships. De Toni and Nassembani (1995) found that the nature of product/process also impact this relationship.

Competitive environment variables are encompassed in the external context in which firms compete. Several of them affect the supplier–buyer relationship. Kekre et al. (1995) cited degree of concentration, competition and availability of suppliers as the most relevant variables. The last one also appeared in González-Benito et al. (2003). Ziggers and Trienekens (1999) stressed the relevance of infrastructures and legal environment.

The above three factors determine the relationships between buyers and suppliers. This relationship is characterised through a number of different variables. Ragatz et al. (1997) for example, included trust, confidence, shared education, and training. Benton and Maloni (2004) added balance of power, commitment, co-operation, duration, attitude, degree of communication, information, and the agreement on planning and goals. From these variables, balance of power is also cited in Zigger and Trienekens (1999), González-Benito et al. (2003), Carter (2000) and De Toni and Nassimbeni (1995). All these variables are encompassed in what we call in Fig. 1 *degree of co-ordination*. In this paper, we want to analyse those variables that affect the level of co-ordination, which is the dimension, that in our view, best summarises the buyer–supplier relationships, and the one in which we are interested in this project.

Table 1
Description of articles that discuss variables influences buyer–supplier relationships

Reference	Objective	Methodological profile
Benton and Maloni (2004)	Test the influence of power driven /seller relationships on supply chain satisfaction	Empirical research in the automobile industry
Carter (2000)	Identify the ethical issues involved in international buyer–supplier relationships	Empirical research in suppliers of diverse industries
Carter et al. (1998)	Investigate the role of the buyer–supplier relationship in integrating TQM through the supply chain	Empirical research in suppliers of diverse industries
De Toni and Nassimbeni (1995)	Carry out a comparative analysis of factors that affect the supply relationships stability	Empirical research in glass and textile sectors
González-Benito et al. (2003)	Analyse the relationship between different purchasing system variables and supplier quality practices	Empirical research in the automobile industry
Kekre et al. (1995)	Determine how different factors affect supplier availability	Empirical research in diverse industries
Ragatz et al. (1997)	Explore the management practices and competitive environment factors that influence integration of suppliers into the NPD process	Empirical research in diverse industries
Ziggers and Trienekens (1999)	Discuss competitiveness of food supply chains with special reference to quality assurance and vertical partnerships	Descriptive study in food industry