



## British Food Journal

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### Article information:

To cite this document:

Roberta de Castro Souza João Amato Neto, (2012), "An investigation about Brazilian mango and grape exports", British Food Journal, Vol. 114 Iss 10 pp. 1432 - 1444

Permanent link to this document:

<http://dx.doi.org/10.1108/00070701211263000>

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BFJ  
114,10

# An investigation about Brazilian mango and grape exports

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1432

Received 28 February 2011

Revised 6 July 2011

Accepted 18 July 2011

## Abstract

**Purpose** – The objective of this paper is to characterise the transactions between European buyers and Brazilian mango and grape producers.

**Design/methodology/approach** – The method selected for this paper was multiple case studies. The Brazilian mango and grape supply chains' export activities to Europe were investigated. The field research was undertaken in Brazil, Germany, The Netherlands and the UK. In total, 41 face-to-face interviews were carried out.

**Findings** – The supermarkets' literature tends to generalise the strategies of retailers focusing on differentiation and preferred suppliers. However, in empirical research conducted in the UK, Germany and The Netherlands it is possible to conclude that the procurement strategies of supermarkets can vary sharply. The results reveal the presence of different agents who demand different quality standards. The level of intensity depends on consumer behaviour, the features of product commercialised and the characteristics of the production segment in each country.

**Research limitations/implications** – First, in relation to the empirical method there is a limitation because the case study does not allow statistical generalisation. Consequently, it will be interesting to undertake quantitative research in order to quantify the variables presented and their impact on the structure of value chains. Second, the research focuses only on two stages of the supply chain, producers and buyers.

**Practical implications** – The differences between UK and German supermarkets challenge the supermarket literature, which tends to generalise the strategies of retailers focusing on differentiation and preferred suppliers.

**Originality/value** – The study shows that the issue of influence and activities of retail agents along the value chain can be analysed taking several variables into consideration: the products commercialised; the distribution segment; and the consumer market. This result opens the way for analysing different structures of the value chain and the impact of these differences on the entry of producers for developing countries into the global market.

**Keywords** Buyer-seller relationships, Case studies, Transactions, Europe, Brazil, Fruits, International marketing, Supply chain management, Value chain, Supermarkets

**Paper type** Research paper

## Introduction

The industrial concentration of the retail sector is one of the main events in the study about food chains. One of the outcomes of this industrial concentration is the increase of requirements (such as traceability and certificates) and suppliers have to make investments in order to meet those (Reardon *et al.*, 2003). It is well argue that retail suppliers are spread over different countries (Ruben *et al.*, 2007; Fulponi, 2006; Jaffee and Masakure, 2005; Garcia and Poole, 2004) and consequently the strategies of the

The authors would like to thank CAPES (Coordination for Improvement of Higher Level Education) for the indispensable financial support.



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retail sector have been leading primary agricultural producers investments in many places in the world, mainly in developing countries. In general, the supermarkets literature tends to generalise the strategies of retailers focusing on differentiation and preferred suppliers (Dolan and Humphrey, 2000; Humphrey, 2007). From this point some questions arise: Is it only differentiation that matters? How do governance mechanisms differ along different transactions characteristics? With this in mind, the objective is to characterise the transactions between European buyers and Brazilian mango and grape producers and how the governance structures can differ.

This paper is divided into four further sections. Section 2 discusses the theoretical background, the transaction costs analysis (TCA). Section 3 presents the method, multiple case studies, and explains the structure of the Brazilian mango and grape supply chains in its exports activities to Europe. Section 4 considers insights from theoretical background in analysing the research subject. Finally, the conclusion is presented.

### **Theoretical background: transaction costs approach (TCA)**

The TCA is a micro analytical approach, which is used to analyse the features of transactions. In this paper the aim is to analyse transactions between two stages in the Brazilian mango and grape supply chains, the producers located in Brazil and the buyers in Europe. The use of TCA for explaining the relations between different stages in supply chain is pointed out by Halldorsson *et al.* (2007). According to Williamson (1985) transaction costs can be divided into costs of information, of negotiation and of monitoring (enforcement). To sum up, they are the costs of driving the economic system. The TCA presupposes that a transaction involves risks, and the parties try to protect themselves creating mechanisms and governing structures in order to reduce them. These risks are called transaction costs.

TCA has some characteristics related to the behaviour of agents. One of them refers to the fact that the economic agents are rational, but in a limited way. Another refers to the fact that the economic agents display opportunistic behaviour in accomplishing transactions. It is difficult to foresee all the future situations that will affect a transaction. Situations who agents (in economic environment) can foresee are established in the contract, but many of them do not appear because of the limitations in the agents' reasoning. Incomplete contracts can cause problems after the signature (*ex-post*), and thus it is necessary to adopt safeguards to protect against problems in adaptation. The presupposition of opportunism is based on the lack of restrictions on the economic agents' selfish behaviour, what also involves setting safeguards to decrease eventual transaction costs. Given the presuppositions of limited rationality and opportunism, it is important to identify the main attributes of transactions and thus analyse the built-in transaction costs and the ideal governance structure for each case, that is, the governance structure that will decrease the transaction costs involved.

In the TCA, the attributes of the transactions are: specification of assets, frequency and uncertainty. For example: when two companies make a transaction, this can mean specific investments by the parties involved, for example, in human resources or a certain industrial plant. These investments are specific to this transaction. In case the transaction does not work out, investments already realised cannot be used for another transaction with the same results.

Depending on the intensity of the specification of the assets demanded in this transaction the economic agents would choose the commercialisation form or

governance structure that decreases transaction costs. The greater the specification of the assets involved in the transaction, the higher the tendency to adopt vertical integration as the governance structure in order to get total control on transaction (Williamson, 1991). On the other extreme, there is the market (or “spot” market) as governance structure that provides total incentive for agents, but no control on transaction (no specificity of assets). The spot market is the best example of a free market where transactions occur without any commitment by the parties. In the middle, there are hybrid structures, such as franchising, long-term formal contracts, long-term “non-formal” contracts, partnerships, co-operation networks, among others (Menard, 1996). The hybrid governance structures combine incentive and control in different levels.

According to Williamson (1985) there are different types of specificity. For this paper the main ones are:

- locational specificity: which is related to the location of asset;
- physical specificity: which refers to the production process and the assets involved in this process;
- human specificity: refers to the human skills involved in the transaction; and
- temporal specificity: which depends on the duration of transaction.

Further, the new trend toward searching for good-quality fresh products by the consumer market increases the specification of assets and implies the adoption of governance structures that guarantee these specifications.

The frequency with which transactions are executed is important for the dilution of the costs of the mechanisms used to accomplish the transaction, which is fundamental in choosing the governance structure. The third attribute is uncertainty, which can be analysed from different perspectives. For the purpose of this article, uncertainty means the absence of complete information with respect to a transaction. This raises the uncertainty regarding the transaction, leading to increased transactions costs (Farina *et al.*, 1997).

Keeping in mind the presuppositions of the economy of transaction costs, opportunism and limited rationality, as well as the attributes of transaction (specification of assets, frequency and uncertainty), it is possible to choose the appropriate governance structure of each transaction, i.e. that which provides the lowest transaction costs.

### **The Brazilian mango and grape supply chain for the European market**

This paper is a study about Brazilian mango and grape exports to Europe. According to the Food and Agricultural Organisation (FAO) Report on tropical fruits, the mango represents 36 per cent of tropical fruit production worldwide. Latin America is responsible for 17 per cent of world mango production and Brazil is the third largest mango producer (FAO, 2007). Almost 100 per cent of Brazilian mango and grape exports come from the São Francisco region, located in the Brazilian Northeast. The European Union is the main destination for Brazilian mango and grape exports, 90 per cent and 68 per cent respectively (SECEX – Brazilian Foreign Trade Secretariat, 2005).

The field research was accomplished in Brazil, Germany, The Netherlands, and the UK from 2004 to 2005. This paper is an outcome of the PhD studies of the first author.

This study challenges the supermarket literature about the generalisation of supermarkets' strategies focusing on preferred suppliers and differentiation (Dolan and Humphrey, 2000; Humphrey, 2007). Having this in mind the method selected for this work was multiple case studies. This method permit to answer questions such as "how" and "why" and allow generalising to theoretical propositions (Yin, 2001; Seuring, 2008; Eisenhardt, 1989; Malhotra, 2001; Lyons, 2005).

About 11 Brazilian fresh fruit importers located in Europe and nine English wholesalers from Spitalfields from London's (the largest fresh food market) were interviewed. The information about importers and wholesalers were obtained in the Brazilian Embassy in London. The Brazilian Embassy has a list of UK agents who keep trade relations with Brazil. Besides, it was undertaken exploratory research in the São Francisco Valley region (by telephone) in order to get information about importers. From these two sources it was concluded that there are not many mango and grape importers and it was interviewed about 90 per cent of agents quoted by two sources.

For the field research in Brazil, the São Francisco Valley, the largest mango and grape-exporting region, was chosen. Face-to-face interviews were held with eight large producers and exporters, four small and medium producers, the director and two agronomists from CODEVASF (a federal government agency created to promote the economic development of the São Francisco Region), the representative from SEBRAE (the Brazilian Micro and Small Business Support Service), the director of VALEXPORT (Exporters Association), three cooperatives and the director of the Brazilian Agricultural Research Agency – (Empresa Brasileira de Pesquisa Agropecuária) – EMBRAPA. At most companies, the face-to-face interviews included field visits to the crops and to post-harvest facilities. In total, 41 face-to-face interviews were made.

According to Seuring (2008), the case study is a method that allows the use of a flexible research strategy. Despite the strength of this feature, the flexibility could be a weak point if the research process is not well documented. The categories of analysis considered on this study are the dimensions of transactions between Brazilian producers and European buyers (Table I).

Categories of analysis	Description
Specificity of assets	Refers to the level of requirements demanded by retailers from fresh food suppliers (formal and informal requirements, quantity of activities required in order to prepare the fresh fruit for distribution (selecting, washing and packing). From the perspective of retailers and producers the specificity of assets is related to the level of investments required for keeping the relationship
Frequency	Refers to how recurring transactions are conducted between the agents
Uncertainty	From the retailer perspective refers to receive the product according to quality patterns required and with the frequency required. From producers perspective, the uncertainties refers to price, the lack of market information and climate factors which affect production

**Source:** Elaborated by authors

**Table I.**  
Variables of analysis

*Mango and grape chains*

The Brazilian mango and grape chain to Europe can vary in terms of number of agents and the functions of each agent. In order to understand how the chain is shaped in this section is characterised the production conditions of mango and grape in Brazil, and the transactions between producers and European buyers. The definition of characteristics of production is important for understanding the specificity of assets required for producers and retailers in this market.

*The characteristics of grape production in the São Francisco region.* The São Francisco Valley has a stable climate and it is the only region in the world that allows two harvests of grapes per year. According to the field research, there is a first harvest (May, June and July), which is not so productive, and the temperature is not as hot as during the second half of the year. Grape prices are higher on the European market during the second semester. Thus, producers plan to produce more grapes in this period due to better production conditions and market prices. In order to do so, producers need to use some production techniques such as floral induction and the production of specific varieties and quantities to meet requirements from special markets. It is also important to plan the use of cold storage and the labour force. The features of the production location in the São Francisco region can characterise location asset specificity.

According to EMPRAPA (2005), the total cost of implementation and monitoring of one hectare of grape in the São Francisco region is about US\$22,800.00 during the first three years. One important feature of grape production is the quantity of sugar in the fruit, the brix. When grapes are harvested, the ripening process is finished. This means that the fruit will keep the brix from that point on. The brix for the external market has to be 14 per cent, at a minimum. In practice, the European supermarkets require a brix from 16 to 20 per cent. The Brazilian grape has high brix because of the intensity of the sun during cultivation.

In general the major export market for Brazilian grapes is the UK. The UK market is sophisticated and demanding, but pays the highest prices and consumes only green seedless grapes, the variety called Festival. The first main European requirement for grapes is the quantity of residues, i.e. of agrochemicals. In this sense, Brazilian producers pointed out the importance of the Integrated Fruit Production Programme created by the Brazilian Government. One of its main objectives is to reduce the quantity of agrochemicals used on the crop and to promote the adoption of certificates. The main ones are the EurepGap, the British Retail Consortium, and some supermarkets certificates such as Nature's Choice from Tesco and Field-to-Fork from Marks & Spencer, both English retailers.

*The characteristics of mango production in the São Francisco region.* The São Francisco region can produce mangoes all year long because of its favourable climate conditions, irrigation techniques and correct manipulation of trees. This makes Brazil the country with the longest lasting supply of mangoes, from August to November. The predominant variety planted in the region is Tommy Atkins, followed by Kent, Keitt and Hadden.

Tommy Atkins is the main variety sold for export due to its productivity and the ripening conditions, which allow it to maintain its characteristics longer. Taking into consideration the distance from Brazil to the European market these features are fundamental.



The mango tree takes four years to begin producing and by the sixth year, reaches full production. According to Embrapa (2005), in the first six years the total cost of implementing and monitoring one hectare of mango in the São Francisco Valley is around US\$11,000.00.

Mangoes keep ripening, even after being harvested. They are highly perishable and need to be commercialised rapidly to avoid losing value. The mangoes have to get to market in from 20 to 29 days (three days for collection, one day for processing in the packing house, one day for transport from packing house to port of origin and one day for storage at port of origin, 12 days for transportation to Europe). This leaves seven days for commercialisation. In order to minimise this problem, the mango is harvested at the lowest level of ripeness, around two (ripeness level varies from 1 to 5). If the mango is sold quickly ethylene is added in order to accelerate the ripening process.

Mangoes are an exotic fruit in Europe where the market only began in the 1990s. The main requirements for mango are the same as grapes, such as quantity of residues and certification.

*Comparison between grape and mango production.* From the production point-of-view, grapes present a high human and physical specificity of assets due to the specialisation of the labour force and production process, respectively. For mangoes, the human and physical specificity are low, and both products have high location asset specificity owing to the favourable production conditions found in the São Francisco region.

Grapes present a low level of temporal specificity when compared to mango. Mango fruit is more perishable than fresh grapes. According to some brokers and producers, grapes can be kept for a long time in cold storage without losing their quality. Another element is the fact that mango is still considered an exotic fruit in Europe, and uses ordinary production techniques, compared to the sophisticated techniques used in grape production. These factors affect the way that grape and mango are commercialised in the European market.

In the case of mangoes, the consignment relationship predominates with producers, even for demanding markets such as the English market. Despite the fact that supermarkets keep close relationships with category managers, these ones have market relations with Brazilian mango producers. Both products have high location asset specificity due to the favourable condition found in the São Francisco region.

Table II details the specificity for both fresh fruits and as we can see grapes have higher specificity compared to mangoes.

*Transactions between buyers and producers.* The distributors of fresh mangoes in Europe are retailers, wholesalers and the catering industry. The latter is responsible for supplying the institutional market. The main destination of Brazilian mangoes and grapes is European supermarkets, followed by wholesalers, and the catering industry. Distributors can differ in terms of quantity demanded and quality standards. It is consensus among suppliers (Brazilian producers) that the retailers are stricter than wholesalers and they are more concerned about quality, high volumes, and reliability and innovation capability. The exception is the German small retailer, which sells higher quality grapes than German supermarkets retail as well as higher prices.

In most cases there is an intermediary agent responsible for transactions between producers and European buyers – which is called broker and the retail requirements –

**Table II.**  
Grape and mango  
production conditions  
and specificity of assets

	Grape		Mango	
	Production conditions	Specificity of assets	Production conditions	Specificity of assets
	Favourable climate conditions: two harvest per year Irrigation	High location	Favourable climate conditions: production all year long Irrigation	High location
	Production techniques (floral induction, specific varieties) High production cost (U\$22,800.00 first three years)	High physical	Low production costs (U\$11.000,00 first six years)	Low physical
	High labour force Labour force more specialised than mango one	High human	Labour force no specialised	Low human
	High brix (quantity of sugar) Low perishable (it can be kept in cold storage for six months)	Low temporal	High perishable	High temporal

refers to producers and brokers activities. For producers the requirements refers to production system and its sustainability, the control and monitoring of agrochemical use, the reliability of delivery, the ability to develop new varieties and their ability to improve product characteristics, such as appearance. In the case of grapes, one of the main requirements is appearance. The English market prefers green grapes and because of the intensity of the sun, Brazil's green grapes are a little bit yellow. This yellow appearance damages the quality image of Brazilian grapes and decreases the price paid to producers.

For brokers, retailers have been transferring some functions such as packing, transport, labelling, promotion in the stores, and the management of categories of products. In the case of English supermarkets they develop a close relation with brokers, called category managers, which include production contracts and management of the supply chain without incurring production costs. English supermarkets define and control the prices that guarantee them a certain flexibility that would not be possible under vertical integration. Brokers need to meet all the retail requirements. Then, the main advantage of selling to retailers is the high volumes demanded.

The category manager has formal contracts with supermarkets, which define: quantity, variety, size, and country of origin, time of supply (usually one year), certificates, and sometimes, fixed prices. Price determination depends on the supermarket's procurement system.

In the UK, the main supermarket chains are Tesco, Sainsbury and Waitrose, and they usually have few suppliers of each category of products. In the case of fresh fruit, specifically mangoes and grapes, each supermarket chain has one or two category managers responsible for the supply of them annually. Usually, the category manager is the link between supermarkets and mango and grape producers from developing countries. However, category managers purchase Brazilian fresh fruit from a broker located in the UK or Netherlands.



*Brokers.* The broker is responsible for all activities from the port of origin (or airport of origin) to selling fruits to retailers, wholesalers, and the catering industry. The activities are:

- transport from country of origin to the destination country;
- inspection of containers in the arrival area in order to verify the quality standards in terms of agrochemicals;
- storage;
- selection for size and quality standards; and
- transport to the place of distribution.

Producers pay the brokers a commission, which varies from 7 to 10 per cent of total sales. It is important to notice that title to goods remains with producers.

In the UK there are situations where brokers act as category managers, maintaining a close relationship with the supermarkets chains. In this case, the category manager has close links with supermarkets but keeps direct relationships with producers in Brazil, for instance.

There is a large category manager in the UK called Grapes Direct Limited, which supplies the main supermarkets chains and buys grapes directly from Brazilian producers. Usually, the category manager is responsible for monitoring the production places and packinghouses as well as to check facilities. In other situations, the supermarkets employ people to monitor and control production activities in developing countries during the season. According to some Brazilian mango and grape importers in the UK, some retailers want exclusivity from category managers.

In the case of Brazilian mango and grape exports, there are situations that producers sell directly to category managers, as happens with some large Brazilian production and export companies located in the Sao Francisco region. They also sell to brokers and two of them have their own trade offices located in the Port of Rotterdam.

There are seven category managers in the entire UK. According to the field research, suppliers in the UK sign annual supply contracts with the supermarkets, but there is no guarantee of keeping the contract in the following year (see Table III).

In countries such as Germany, France and Portugal there is no category manager and many Brazilian producers and exporters sell directly to French and German supermarkets. In the German case, five major supermarkets have 60 per cent of the market share. The retail model predominant in Germany is the grocery discounter, which is characterised by a low level of services, low prices and narrow variety of products (Wortmann, 2003, 2004).

Grape		Mango	
Category management	Supermarkets	Category management	Supermarkets
Grapes Direct Limited	Tesco	Utopia	Tesco
RedBridge	Sainsbury	Minor, Weir and Willis	Sainsbury
Hars & Hagebauer	Morrison & Safeway	Malet Select	Marks & Spencer

**Source:** Based on field research (2004, 2005)

**Table III.**  
Some supermarkets and  
their category managers  
for mango and grape in  
the UK (2004, 2005)

According to the field research, supermarkets employ different standards, despite the fact that some certificates are the same for all of them. Nevertheless, there are some supermarkets that have specific certificates, such as Marks & Spencer (From Field to Fork) and Tesco (Nature's Choice). In general, the English supermarkets are the strictest compared with German supermarkets.

*Transactions between brokers and Brazilian mango and grape suppliers.* According to the field research it is possible to define several types of transactions between European buyers and Brazilian producers:

- *Vertical integration:* in this situation the producers commercialise their fruits themselves. Producers have commercialisation offices located in Rotterdam, in The Netherlands. They are responsible for all activities from production to deliver them to wholesalers and retailers in European countries. According to producers, the main argument in favour of hierarchical relationship is to be closer to the market and understand how it works which implies in reducing the uncertainty. There are two companies in the Sao Francisco region that have vertical integration in their mango and grape sells to Europe. In this transaction the frequency and specificity of asset is high, and uncertainty is low.
- *Consignment basis:* in this transaction producers hire one firm/broker (or more) to commercialise their fruits in Europe. The firm receives a commission that could vary from 7 per cent to 10 per cent of total sales. They can have long-term relationships but there is no commitment between them for doing the same transaction in another time. This kind of transaction is predominant for mangoes without any kind of certificate. In the case of short and low frequency relations it is possible to characterise a spot market as a governance structure. In this situation there is low frequency and specificity of assets, and high uncertainty.
- *Consignment – selected firm:* in this transaction producers are represented by a firm in the global market, and a contract is established and signed by both parties. When the first shipment of the season arrived in Europe the firm verifies the quality standards of fruits. If the fruits meet the standards, the firm pays producers for less than 50 per cent of the total payment for the season. This firm is responsible for commercialising the fruits and to transfer to producers' information about standards and how to meet them. Despite a long-term relationship the firm receives a commission for its services from 7 per cent to 10 per cent. Only one cooperative of grape producers has this kind of relation. This cooperative is responsible for 65 per cent of Vale do São Francisco grape exports. In this transaction the specificity of asset and frequency is high, and uncertainty is low.
- *Consignment – trust relationship:* it involves long-term relationship (about ten years in some cases), high frequency, and producers are addressing buyer's requirements in terms of quality patterns and certificates. It can be characterised as hybrid transaction. It is usual for some skilled mango producers and for grape producers who are not a member of the biggest grape export cooperative in the Sao Francisco region. In this transaction the specificity of assets and frequency is high and uncertainty is low.

When brokers refer to fresh fruit purchases, they mention the country supplier, not the producer or exporter. This fact indicates the importance of location specificity of these chains because supply is identified by country and not by agent. The main elements considered for selecting the suppliers are price, quality, variety (mix) and volume.

From the field research with mango brokers, we assume that the main relationship between brokers and Brazilian mango producers is by consignment. Despite the fact that Brazil has a long season and produces the Tommy Atkins variety in large volume (which implies in high location specificity) mango has low physical and human specificity.

For grapes, the main relationship between grape brokers and Brazilian producers is by consignment with advance payment (at the beginning of the season). Brazil has the advantage of having two seasons, which implies in high location specificity. Besides for grape production it is necessary certain production techniques and a labour force more specialised that characterises a high human and physical specificity of assets. In the past, grapes were commercialised only by fixed price agreements, but this relationship has changed over the years, until arriving at the mechanism of consignment with payment in advance. A fixed-price relationship only happens when grapes are scarce on the market.

This investigation shows that Brazil has natural advantages for both crops. Nevertheless, according to buyers, it is fundamental to improve production planning to supply the quantity demanded by Europe as well as to increase the volume of some varieties such as Kent and Keitt in the case of mangoes. For grapes, buyers emphasised the importance of increasing the volume and improving production techniques to produce grapes in order to decrease the yellow colour in green variety of grape for improving the appearance.

In terms of the structure of the chain in the main markets investigated, UK and the Germany, food sales are concentrated in a few supermarkets. However, the strategies are distinct. English supermarkets have category managers and they do not have a direct relationship with Brazilian mango and grape producers. The presence of category manager's suppliers adds a new segment in the chain. According to the field research, UK consumers are interested in convenience and that is the main characteristic of supermarket service. The main focuses of English supermarkets are high quality, service and prices.

German supermarkets buy mangoes and grapes from brokers or Brazilian producers in the market predominantly. Small retailers located in suburbs who sell fresh foods are still very popular. The German supermarkets (discount groceries) are focused on low prices and low service. The main governance structure for buying fresh fruit is spot market because the physical and human specificity are low in the case of mangoes. For grapes, the main governance structure is consignment with advance payment. In Germany, there are wholesalers working on the commercialisation of mangoes and grapes, as well as small retailers. According to the field research the quality of grapes sold in small retailers is higher than those sold in supermarket (grocery discounters).

Despite the fact that English supermarkets have close relationships with suppliers, called category managers, the latter ones do not have close relationships with mango producers. The main governance structure is the market. So, for the same product, there are different governance structures.

## Conclusions

The objective of this paper is to characterise the transactions between European buyers and Brazilian mango and grape producers. The method of empirical research was multiple case studies, which were made viable through face-to-face interviews with mango and grape producers located in Brazil and buyers located in the UK, Germany and The Netherlands.

The findings indicate that in the markets studied, the level of industry concentration in food retailing is high, but the German retail model is based on cost competition, while in the UK product differentiation is more important. As a result, the supply chain strategies of German retailers are largely based on market relations with suppliers, whereas in the UK and The Netherlands, supply chains are characterised by the presence of category managers and high levels of coordination along the chain. The differences between UK and German supermarkets challenge the supermarkets literature that tends to generalise the strategies of retailers focusing on differentiation and preferred suppliers.

Regarding managerial implications this study contributes for characterising the governance structures of transactions in different markets, and shows the differences between them based on the dimensions of transactions. Having this in mind the study contributes for producers who are interested in their entry into the global market.

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