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Abstract

Purpose – The purpose of this paper is to describe the forms of coordinating transactions used by a large beef slaughterhouse and processing companies and their suppliers of beef cattle, and to identify the reasons for the adoption of plural forms of governance for their transactions with cattle suppliers.

Design/methodology/approach – A case study format was selected for this investigation. The focal company selected offers a large number of products derived from beef for different commercialisation channels in the domestic and foreign market. A non-probability sample of 30 suppliers (cattle farmers) of the focal company provided data on finished steers sold in 2010, according to the three types of governance used in the transactions (spot market, forward contracts and long-term contracts).

Findings – The simultaneous use of more than one type of governance structure to coordinate similar transactions has been termed plural forms of governance in the literature. In Brazil, new forms of governance, such as formal and informal contracts, have been adopted for transactions between beef processing companies and cattle farmers, in addition to the use of spot market and vertical integration. It has been shown that the adoption of plural forms reduces the risk of complex transactions; and is a strategy to deal with unpredictable institutional environments and high heterogeneity of both suppliers and distribution channels.

Research limitations/implications – The research provides empirical evidence of plural forms of governance, as well as the reasons for the adoption of this strategy by firms, which contributes to the ongoing theoretical discussion on this subject.

Practical implications – The paper has implications for company supply chain management.

Originality/value – This paper presents theoretical review on plural forms of governance, new empirical evidence and determinant factors for their adoption.

Keywords Supply chain, Brazil, Vertical coordination, Beef industry, Buyer-supplier relations, Governance structure

Paper type Case study

1. Introduction

The growing pressure for higher quality and improved food safety, as well as the environmental sustainability of production processes, has impacted the institutional setting in which agro-industrial supply chains are found (Lindgreen and Hingley,

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2003). A new list of policies, laws and control systems has been adopted in an effort to meet these new market demands. The agents of the supply chains, especially the rural producers and processors, have reacted by changing production systems, incorporating innovations and modifying market relations.

In the beef supply chain, it was necessary to introduce traceability mechanisms, launch initiatives to standardise products, react more quickly to changes in consumption habits, differentiate products and reduce seasonality in the supply of raw material (Souza Filho *et al.*, 2010). The beef industry in Brazil is no longer a traditional supplier of beef carcass, as a commodity, and has transformed itself into a supplier of specialised products, such as cuts with different quality requirements for a broader set of distribution channels. In the domestic market, some commercialisation channels are very demanding, such as boutique butchers and sophisticated restaurants, in which quality is the determining factor in the customer's decision to purchase. However, for the majority of customers in the low-income bracket, who purchase beef in supermarkets, butcher shops and open-air markets, price is much more important than quality in determining the decision to purchase. The foreign market, although more demanding in terms of quality, is also segmented. While the European Union (EU) requires high quality control standards, including a traceability system, and pays a higher price for this, other regions are less demanding in terms of control and demand products with lower prices.

This new market configuration and the rising importance of Brazil in the international beef market were followed by significant changes in market relations between beef processing companies and cattle farmers. Closer ties between rural producers and processing companies have been observed, formally through contracts or informally, with the aim of raising the efficiency of the production systems and reacting to these new circumstances (Vieira and Traill, 2008). In addition to the traditional spot market, recent studies have identified the adoption of new forms of governance, such as formal and informal contracts, for transactions between beef processing companies and cattle farmers, as well as growth in vertical integration (Zylbersztajn and Machado Filho, 2003; Caleman *et al.*, 2008).

The adoption of new forms of governance for the transactions between beef processing companies and farmers is related to the changes observed in the demand for beef. However, one cannot ignore that the factors associated with beef cattle production systems adopted in Brazil also play a role. In Brazil, various livestock production systems coexist, for which different standards of technology and administration are adopted, as well as different breeds of beef cattle. As a result, the supply of cattle for the slaughterhouse units presents great diversity in terms of quality and standards. Thus, a great deal of coordination is necessary to match the heterogeneity of the consumer beef market with the heterogeneity of the supply sources for beef cattle. In this context, the adoption of more than one governance structure by the beef industry can be justified.

The simultaneous adoption of more than one type of governance structure by the same company or within the same production chain to coordinate similar transactions was classified in the literature as plural forms of governance (Bradach and Eccles, 1989). Studies have been carried out to analyse the adoption of plural forms and identify their main determinants and potential advantages (Bradach, 1997; Mols, 2000; Affuso, 2002; Zylbersztajn and Nogueira, 2002; Heide, 2003; Parmigiani, 2007; Silva and Azevedo, 2007; Dant *et al.*, 2008; Gellynck and Molnár, 2009; Perrigot *et al.*, 2009; Mello and Paulillo, 2010; Schnaider and Saes, 2011; Menard, 2011; Brookes and Roper, 2012). According to the literature the main advantages of the use of plural forms are: lower transaction costs (Mols, 2000; Affuso, 2002; Mello and Paulillo, 2010; Schnaider and Saes, 2011); the potential synergies that the different forms of governance can provide (Bradach and Eccles, 1989; Bradach, 1997; Brousseau and Codron, 1997; Schnaider and Saes, 2011; Menard, 2011); better planning and control of production capacity, supply and distribution, resulting in higher production efficiency (Parmigiani, 2007; Perrigot *et al.*, 2009); more effective monitoring of external suppliers with a resulting reduction in asymmetric information in the transactions (Mols, 2000; Heide, 2003; Menard, 2011); and greater flexibility for the firms to meet their needs (Brousseau and Codron, 1997; Silva and Azevedo, 2007; Perrigot *et al.*, 2009).

Against this backdrop, the main objective of the present work was to describe the forms of coordinating transactions used by a large beef slaughterhouse and processing company and its suppliers of beef cattle, as well as to identify the causes of different governance strategies the firm is following. Section 2 presents a review of the literature on plural forms of governance, allowing the identification of potential determinants and advantages of this strategy. The methodology for empirical analysis is based on a case study of a large Brazilian beef processing company, as presented in section 3. The results are presented in section 4, followed by final remarks in section 5.

2. Plural forms of governance

The analysis carried out in this article employs the theoretical frameworks of New Institutional Economics (NIE) and Transaction Costs Economics (TCE). NIE challenges neoclassical microeconomic theory by contesting the automatic functioning of the market solely through price mechanisms (Coase, 1937). According to NIE, transactions occur in an institutional environment, which determines their rules of operation. In this way, the objective of NIE is to identify which is the best form of organisation for economic transactions, since different configurations change the rules for resource allocation. TCE is based on the assumption that the issue of economic organisation is, above all, a matter of governance. In this sense, it endeavours to explain the different organisational forms that exist in the market and their contractual arrangements, highlighting the institutional environment and its interaction with organisations. According to TCE, there are different possible governance structures and the agents must work to discover governance structures that enable lower transaction costs. In a broader definition, transaction costs can be described as the "costs of running the economic system" (Arrow, 1969, p. 48) or the "equivalent of friction in physical systems" (Williamson, 1985, p. 19). There are *ex ante* and *ex post* transaction costs. The first are the costs of drafting, negotiating, and safeguarding an agreement, while the second are costs incurred when transactions drift out of alignment.

Williamson (1985) identifies three basic forms of coordinating transactions, also called governance structures:

(1) Spot market – adapted form of non-specific transaction, where there is no effort made to repeat the relationship. In this format, the evaluation of the relationship by the parties is based on experience. It is the case that best approximates the neoclassical theoretical framework of pure competition.

(2) Hybrid forms – given the specificity of the assets and the recurrence of the transactions, relationships of trust can be built. In this case, incentives sufficient to bring the transaction between the agents into the firm (vertical integration) were not found. Formal and informal contracts can be established, since the agents are inclined to establish and comply with their clauses.

(3) Vertical integration or hierarchy – coordination necessary for regular transactions and in the presence of highly specific assets. In this case, the transactions between agents are brought into the hierarchy of the firm.

The emphasis placed by Williamson (1985) on the analysis of arrangements uncovered hybrid structures, which lie somewhere between the market and the hierarchy. Ménard (2004) stressed the need to build a theory that explains these structures, in which the agents are completely independent of each other, but work together in some type of business. In arrangements of this type, the agents share technological knowledge, capital, products or services, without, however, becoming a part of activities within a single firm. The influence of price mechanisms is lower than in the spot market. Regardless of its format, the coordination of activities is based on cooperation between the parties and in the sharing of important decisions, such as investment decisions. This union creates a culture that encourages the joint pursuit of better performance and greater profitability for the whole. However, a poor distribution of tasks and gains can easily generate conflict, which can destabilise the arrangement.

Various studies have used TCE with the aim of identifying existing governance structures. In sectors focusing on the production of agri-food products, the emphasis has been on agricultural food chains, allowing the identification of the three basic forms, as defined by Williamson (1985). Although Williamson (1985) did not directly touch on the the possibility of companies using more than one structure of governance simultaneously, Bradach and Eccles (1989) found that this did in fact occur in the real world. The authors have termed this as plural forms, in which "[...] distinct organisational control mechanisms operate simultaneously for the same function by the same firm." (Bradach and Eccles, 1989, p. 112). Following them, many studies have identified the coexistence of more than one form of governance within the same supply chain to govern similar transactions (Bradach, 1997; Mols, 2000; Affuso, 2002; Zylbersztajn and Nogueira, 2002; Heide, 2003; Parmigiani, 2007; Silva and Azevedo, 2007; Dant *et al.*, 2008; Gellynck and Molnár, 2009; Mello and Paulillo, 2010; Schnaider and Saes, 2011; Menard, 2011; Brookes and Roper, 2012). Most of these studies address the adoption of plural forms in downstream transactions. Few studies have sought to identify the adoption of more than one form of governance in upstream transactions; as did Heide (2003), on purchasing relationships between original equipment manufacturers and component suppliers, and Parmigiani (2007) on sourcing model decisions by manufacturing firms in the tooling industry. Also, a few of them have adopted a single firm approach, as in section 4 of this article.

The literature that addresses the coexistence of various forms of governance in a single market, or by a single firm, presents various explanations for the phenomena. These explanations can be classified into three groups, which will be analysed below: different features of the transactions; plural forms as a transitional situation; and stable plural forms as a strategy to coordinate the transactions over time. According to the authors of the first group, organisational forms can be plural, or in other words use more than one type of governance structure, if the transactions are different, distinguishing themselves in at least one of their classic features: specificity of assets, uncertainty and frequency. This explanation for the use of plural forms is in line with the model by Williamson (1991), which states that different mechanisms actually govern different transactions in at least one feature. For Minkler and Park (1994), the different levels of specificity of assets involved in the transactions established by the firm are what justify the simultaneous presence of different governance mechanisms. The theoretical framework proposed by Menard (2011) added the attribute ambiguity, which arises out of a difficulty to analyse the specificity of the assets at the time the transaction is conducted, and the complexity of the transactions in the analysis of the adoption of plural forms. In this sense, Mols (2000), Heide (2003), Parmigiani (2007) and Mello and Paulillo (2010) found empirical evidence that the adoption of plural forms is explained by differences in transaction-specific investments, uncertainty and transaction frequency.

The second and third group of authors use the same arguments as the first group to justify the existence of plural forms. However, they add to the discussion on the stability and advantages of plural forms. The author of the second group considers the use of more than one form of governance as transitional, where one or another governance structure should prevail as adjustments occur. Within the scope of the agro-industrial systems, the issue of plural forms was addressed by Zylbersztajn and Nogueira (2002), who assumed that the most efficient arrangement would be gradually adopted by the agents, in other words, alternative types of governance could coexist as points of disequilibrium in an adjustment process. For the authors, the plurality of arrangements could be explained by: situations of disequilibrium, in which the presence of plural forms could represent a situation of adjustment between the current and future forms, driven by modifications in the features of the transactions; barriers to the adoption of a new improved governance due to the existence of specific non-transferrable routines; and effects of the institutional environment in which governance occurs as an event generating multiple alignments.

The authors of the third group argue that plural forms are stable and are part of the strategy for coordinating transactions by firms. The justification for this is found in the complementarity of the mechanisms of governance (Bradach and Eccles, 1989; Brousseau and Codron, 1997; Bradach, 1997; Heide, 2003; Parmigiani, 2007; Schnaider and Saes, 2011; Menard, 2011). In other words, this stability in the mix of governances occurs due to the possibility of exploring some synergy between complementary mechanisms of governance. In this case, there are situations in which part of the function of the contract would contribute to the efficiency of another contractual form, revealing that, in addition to being alternatives, the mechanisms of coordination can be complementary. The pioneering study by Bradach and Eccles (1989) posited that the adoption of plural forms of governance is related to the use of one form of governance to manage the other. For example, the companies can adopt vertical integration to acquire knowledge about a production process of its raw material and, based on this knowledge, begin to demand better results from their suppliers in terms of the quality or price of the product supplied. Porter (1980) had already noted some of the advantages that partially integrated companies obtain in relationships with their suppliers on the spot market. Although the author did not expressly use the term plural forms, he did perceive that by adopting more than one form of governance (vertical integration and spot market) in upstream transactions, the companies were able to exercise greater bargaining power in the purchase of raw materials from external suppliers on the spot market. Brousseau and Codron (1997), upon analysing the supply of fruit in French supermarkets, discovered that the coexistence of plural forms promotes complementarity for the firm, allowing the distributor to: match price and quality strategies; ensure flexibility to face uncertainties about the quantity and quality of production; and enable the learning of a governance to be used in the management of the other, resulting in a cross-learning effect.

According to the literature of TCE, transactions made purely on the spot market are subject to the problems of adverse selection and moral hazard. Heide (2003) proposes that a plural forms approach involves using a particular type of agent (i.e. an internal one) to reduce the problems of information asymmetry (adverse selection and moral hazard) in relation to another type of agent (i.e. the external one) due to the nature of the information that becomes available through vertical integration or partnership contracts. Information on the production and process technology used by suppliers outside the company is not always visible, and can result in adverse selection. Moral risk occurs when suppliers selected by the company act in an opportunistic manner, altering, for example, the quality of the input pre-established between the parties. This behaviour harms the competitiveness of the firm. The author, using primary data on purchasing relationships between original equipment manufacturers and component suppliers, and a logit model approach, found that the higher the asymmetry of information present the transactions, the higher the chance that the companies would use plural forms with their suppliers. In this case, plurality is understood to mean the adoption of hierarchy to partially meet the supply needs of the companies. The remainder of this supply would be met by a third party. The adoption of plural forms enables a reduction of information asymmetry in the transactions with suppliers, without having to internalise all production. By internalising part of production, the firms are able to impose elements of a hierarchical transaction in their transactions in the spot market, which, in turn, reduces the possibility of exposure to moral risk or adverse selection in transactions (Heide, 2003).

Parmigiani (2007), when analysing sourcing model decisions from 193 manufacturing firms, found evidence that the adoption of plural forms is stable in the long term. Using qualitative choice statistical models, the author identified that the adoption of plural forms is determined by transaction attributes (asset specificity and uncertainty), as well as by proxy variables for allocative efficiency and firm capabilities. The finding that all three theories (TCE, neoclassical economics and firm capabilities) contribute to the choice of sourcing mode illustrates the firm's desire to simultaneously monitor suppliers, produce efficiently and improve processes (Parmigiani, 2007). Schnaider and Saes (2011) also argue that plural forms are stable in the long term, since they allow companies to take advantage of market incentives, increase the level of monitoring and coordination of transactions and production activities. Hybrid forms, vertical integration and the spot market can be simultaneously adopted to reduce both transaction and production costs.

Menard (2011) developed a theoretical framework that aligns most of the arguments presented in the literature to explain the existence of plural forms of governance. According to the author, three determinants play a major role: "ambiguity surrounding the fitness of a mode of organisation for the transaction in question; complexity of a transaction or a set of transactions; and strategic behaviour". There will be ambiguity about the choice of the governance because the degree of specificity of assets involved cannot be assessed precisely. In these cases, the expected benefits from one type of governance or another cannot be precisely evaluated. It is almost impossible to assess the marginal advantages of one mode of organisation over another, so plural forms are adopted.

The second determinant is the complexity of some transactions, which can generate uncertainties about the appropriate manner to monitor the transaction. In this case, the problem is not one of evaluating the specificities of the assets, but rather the problem of finding an appropriate manner of monitoring the transactions. In highly complex transactions, the risk of adopting only one form of governance can be quite high, increasing transactions costs and generating inefficiencies for the firms. The solution would be to adopt plural forms to mitigate the risk generated by the complexity. The third determinant for adoption of plural forms is the strategic behaviour in the organisation of certain transactions. This happens "when a party intends to take the lead of the relationship by determining the governance structure of the arrangement but faces problems of coordination or control that could challenge his capacity to reap the benefits." The use of different organisational forms can facilitate monitoring and control, so that a more significant part of the rent can be captured. Menard (2011) concluded that the firms could find different solutions to govern similar transactions, adopting plural forms and generating multiple equilibria, unlike the single equilibrium (resulting from the adoption of the form of governance that minimises transaction costs) proposed by Williamson (1991).

In summary, the body of studies reviewed establishes the following explanations and advantages for the adoption of plural forms: transaction characteristics (asset specificity, uncertainty, frequency, ambiguity and complexity); effects of the institutional environment; complementarity of the forms (generation of synergies, cross-learning effects); ensuring flexibility when faced with the uncertainties/complexities of the transactions and variations in demand; resolving the problem of information asymmetry to avoid adverse selection and moral risk.

3. Methodology

A case study format was selected for this investigation. The focal company selected offers a large number of products derived from beef for different commercialisation channels in the domestic and foreign market. The company has therefore adopted a wide range of commercialisation strategies to both sell beef products and buy cattle. However, data on the quantity of cattle it buys, according to each type of governance was not provided them, because it was considered strategic information. Notwithstanding, a non-probability sample of 30 suppliers (cattle farmers) of the focal company provided data on finished steers sold in 2010, according to the three types of governance used in the transactions (spot market, forward contracts and long-term contracts). Out of a total of 74,301 cattle, 31,818 (43 per cent) were commercialised using a forward contract, 24,000 cattle (32 per cent) were commercialised using a long-term contract established with the owner of the integrated cattle farm that is certified to export to the EU, and 18,483 cattle (25 per cent) were commercialised through the spot market. These data corroborate the qualitative information obtained through interviews with the manager of market operations of the focal company regarding the use of plural forms of governance for purchase of cattle.

The company has six slaughterhouses located in different Brazilian states, two slaughterhouses abroad, 11 distribution centres in Brazil and offices in the main countries to which it exports its products. In 2010, 192,900 tons of *in natura* beef was sold on the international market and 121,600 tons in the domestic market. The main destinations of beef exported were the Middle East (26.1 per cent of the volume exported), followed by Russia and other states of the former Soviet Union (25.8 per cent), the Americas (19 per cent), Africa (14.9 per cent), Europe (8.7 per cent) and Asia (5.3 per cent). The company was responsible for 20.2 per cent of the total revenue from Brazilian exports of beef for the year 2010.

Interviews were carried out with the manager of market operations for the focal company, a specialist in the finished cattle market and a certification specialist. For these interviews a semi-structured questionnaire was used to obtain information that enabled: the mapping of the supply chain of the focal company, covering the different distribution channels and types of suppliers; identification of the product attributes valued in the distribution channels; identification of the features of the transactions with the suppliers and the forms of governance being used; and identification of major determinants of governance strategies that the focal firm is following. A previous version of the results was submitted to the manager of market operations of the focal company for validation of the results.

4. Results and discussion

Figure 1 shows a diagram of the supply chain of the focal company, which is located at the centre of the figure. Its transactions with different distribution channels and suppliers are represented by solid lines and identified by Tn. Two main distribution channels were identified for the domestic market and two for the foreign market. In the domestic market, the meat processing plant serves the meat demand for barbecue houses (T1) and retailers (T2). In the foreign market, there are clients from the EU (T4) and other countries (T3). Each one of these distribution channels has its own characteristics and values different attributes of the beef.

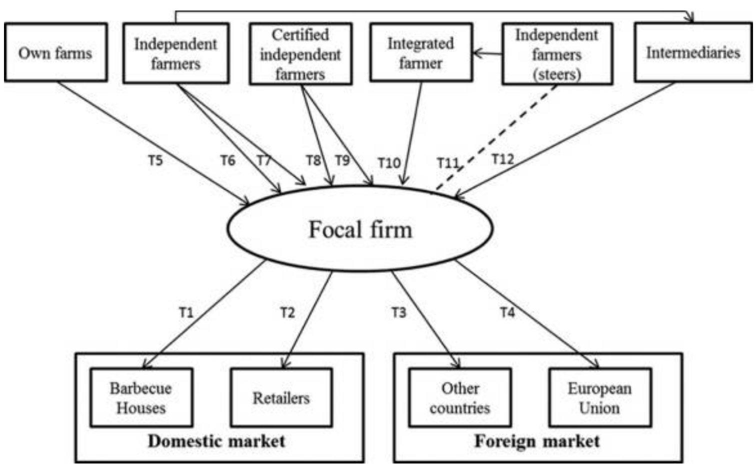

Figure 1.
Diagram of the supply chain of the focal company

To meet this demand, the focal company obtains beef cattle through transactions with independent cattle farmers (spot market, T6; forward contract, T7), independent cattle farmers certified to export to the EU (forward contracts, T8; and spot market, T9), an integrated farm using a partnership model (T10) and intermediaries (T12), as well as from production on their own farms (T5). The intermediaries also obtain beef cattle through transactions with other cattle farmers, but this is outside the scope of the analysis of this study and is not represented in Figure 1. It is important to note that transaction T11, the only transaction represented by a dotted line, is carried out between the focal company and cattle farmers who raise backgrounding steers. This transaction does not involve direct physical flow of animals between these farmers and the focal company, and is part of a wider arrangement of partnerships coordinated by the focal company, which will be further explained later.

Table I shows a summary of the transactions established by the focal company with the different commercialisation channels (downstream) and level 1 cattle farms (upstream). The transactions with cattle farmers are further classified according to their priority (priority and marginal). The priority transactions for the purchase of cattle are those that occur more frequently and with higher volume. They serve the demands of the respective commercialisation channel more efficiently. The marginal transactions are those that occur sporadically.

Note that to serve the barbecue houses (T1), only one type of transaction was used (T5). However, to serve the remaining commercialisation channels, two or more transaction types are always used. The most extreme case is serving the demands of the domestic retail market, which can be carried out using four types of coordination.

The following sections describe the relationship between the beef attributes desired by the main distribution channels and the governance structure established in each transaction for the acquisition of cattle.

4.1 Barbecue houses

The focal company uses a T1 transaction to serve barbecue houses. These establishments value organoleptic characteristics, such as tenderness and flavour. These characteristics, as described by Azevedo (2000), are experiential, meaning that they are only observable during consumption. The presence of these organoleptic characteristics in the final product depends on a set of factors (animal genetics, animal nutrition, production system and industrial processes) that are not visible to the end consumer, and are also many times not visible to the focal company.

To resolve the problems of measuring the quality of the raw material and the final product, Azevedo (2000) proposed the use of long-term contractual arrangements with

Downstream transactions		Upstream transactions Priority	Marginal
Domestic market			
Barbecue Houses	T1	T5	–
Retailers	T2	T6 and T7	T5 and T12
Foreign market			
Other countries	T3	T8 and T10	T9
EU	T4	T5, T6 and T7	–

Table I. Upstream and downstream transactions established by the focal company the suppliers or the vertical integration of production. These two forms of commercialisation have the potential to minimise the problems of measuring characteristics of the raw material, increasing control over the process of raw material production and, consequently, increasing the quality of the final product. In fact, to serve the distribution channel represented by the barbecue houses/grills, the focal company generally uses vertical integration (transaction T5). On its own farms animals are produced that meet the organoleptic characteristics of flavour and tenderness that are valued by this distribution channel. According to the interview with the manager of market operations, by internalising part of the production, the company reduces information problems and costs associated with measuring characteristics of experiential goods, in addition to considerably increasing control over the quality of the raw material, therefore reducing transaction costs. However, by internalising part of the production of raw material, the company increases its production costs, which is compensated by higher prices paid by agents of this distribution channel.

4.2 Retailers

The distribution channel represented by the retailers (small, medium and large retail chains) is served by the focal company using the T2 transaction. In this type of transaction, the cuts of beef are standardised and sold under the focal company's own brand. This distribution channel is less demanding than barbecue houses with regard to organoleptic characteristics. In this case, the attributes most valued by the consumer at the time of purchase are price and quantity. However, the increase in per capita income and purchasing power of the Brazilians has changed food consumption habits and made the Brazilian consumer increasingly demanding, mainly with regard to meat quality and food safety. The persistence of this increase in income points to continued changes in attributes valued in this distribution channel and includes the emergence of more demanding market niches.

To serve the distribution channel represented by the small, medium and large retail chains (transaction T2), the focal company acquires raw material from independent cattle farmers. These transactions occur predominantly through the spot market (transaction T6) and through forward contracts (transaction T7). To a much lesser extent, the focal company also uses animals from its own farms (transaction T5) to serve this distribution channel.

In the transactions formalised by means of a forward contract, clauses concerning the future delivery date of the animals, quantity, weight, age and sex of the animals, in addition to price, are pre-established. The price is calculated based on the indicator ESALQ/BM&F[1], with the addition or not of a premium. This premium is determined by the supply and demand conditions of the market and by the quality of the animal.

For the cattle farmer, the forward contract allows the technical and financial scheduling of production and reduces the risk due to greater specificity of the asset and uncertainty of the institutional environment, ensuring the future sale of the product at a pre-determined price and encouraging investment in improvements to the production processes with possible gains in quality and productivity. For the focal company, it ensures the supply of raw material with pre-specified standards of quality and allows better planning and control of supply and production with consequent gains in coordination and competitiveness.

With a more comfortable position from which to plan its operations, including a lower risk of raw material shortages, the company increases its bargaining power in transactions with cattle farmers on the spot market. In other words, the more secure availability of animals purchased through forward contracts reduces dependence on the spot market and, in this way, the company can obtain lower prices than the average observed in this market. This strategy corroborates the idea that the use of plural forms of governance enables gains from synergies (Brousseau and Codron, 1997; Parmigiani, 2007; Schnaider and Saes, 2011; Menard, 2011). In the case of the present study, the focal company takes advantage of the potential for financial planning, scale and quality that the forward contract can offer and, as a result, obtains lower prices on the spot market. This supply strategy adopted by the focal firm corroborates the pioneering vision of Bradach and Eccles (1989) that the adoption of plural forms of governance is related to the use of one form of governance to manage the other.

It is also important to note that in some regions of Brazil, the focal company conducts transactions with intermediaries, carried out through the spot market (transaction T12) to acquire finished steers that will be used in the production of beef for the retail market. These intermediaries purchase animals from various small producers and resell them, with gains from scale, to the focal company. However, these transactions are marginal and tend to shrink as the market evolves and as the company reduces transaction costs and increases control over the quality of the raw material.

4.3 EU

The EU market (transaction T4) is demanding with regard to organoleptic characteristics of the beef and food safety. This distribution channel also requires the traceability of the animals, from rural production until slaughter. The traceability system used in Brazil, known as SISBOV[2], is supervised by the Ministry of Agriculture, Livestock and Supply (MAPA), which is responsible for certifying the farms where cattle are obtained for meat production and exported to the EU[3].

The rural producer who wants to raise animals that can be used in the production of beef for export to the EU must meet the following requirements: SISBOV enrolment, producer registration, farm registration, basic production protocol, record of inputs used at the farm, individual identification of all of the cattle on the farm, control of animal transfer and monitoring by a single certification agency. The certification process is relatively slow and must be audited on a bi-annual basis by MAPA. Certification for export to the EU is also used as a benchmark for other countries, such as Russia and the Middle East (Vinholis and Souza, 2010).

The set of requirements imposed by the EU increases the specificity of the raw material, pointing to a need to build a relationship that is closer and more coordinated between the focal company and its suppliers. In this way, to purchase animals that will meet the requirements of this commercialisation channel, the focal company uses T8, T9 and T10 transactions, detailed as follows.

To obtain finished steers using the T10 transaction, the company coordinates partnerships with two types of animal suppliers: a large cattle farmer (owner of a farm certified for export to the EU) and a group of cattle farmers supplying backgrounding steers (raised on uncertified farms) (Figure 1). The focal company purchases backgrounding steers from the uncertified farms (T11) to then supply the certified finishing farm[4, 5]. The T11 transaction does not involve the direct flow of animals, but the negotiation of backgrounding steers that will be fattened and confined on the certified farm, and then later slaughtered by the focal company. Payment for these backgrounding steers to the cattle farmers will be made by the focal company only after the finishing stage on the certified farm, in other words, at slaughter, with the price determined at time of purchase or set on the date of slaughter using that day's market price. The integrated confinement farm has the capacity to fatten 24,000 head of cattle a year, and is dedicated exclusively to the final production phase of the animals, which consists of a 90-day confinement. The focal company formalises a long-term partnership contract with the owner of the cattle farm in which he pledges to supply backgrounding steers and technical assistance, as well as the predetermined amount of R$ 0.50 per 15 kg of fattened animal. The monetary value of the weight gain obtained by the cattle on the farm (the difference in weight upon entering and leaving confinement) is paid by the focal company. With this governance structure, the focal company ensures a supply of high-quality cattle that it needs to serve the EU. The following list presents the advantages that the governance structure developed and coordinated by the focal company for transaction T10 can provide to the three agents involved:

(1) Advantages for the livestock suppliers of backgrounding steers:
   - the ability to export to the EU and receive half the Europe premium without being on the TRACES list and without having to pay the costs of traceability;
   - the ability to establish a forward contract with the meat processing plant, protecting itself from price variations in cattle and ensuring its sale; and
   - resting of pasture during the dry season, when animals go to the finishing farm, providing increased capacity during the rainy season and increased productivity.

(2) Advantages for the focal company:
   - the company maintains a safe stock of 24,000 head of cattle per year through a long-term contract with the owner of the finishing farm;
   - despite having to pay for part of the production costs (animal nutrition and consulting), the company can focus on its core activity by outsourcing the raising and fattening of animals; and
   - control over the quality of raw material through incentives for use of management and nutrition techniques.

(3) Advantages for the owner of the finishing farm:
   - receives a set price per head and pays no transaction costs, since the focal company negotiates the purchase of the animals for finishing on the certified farm and all the animals are slaughtered at the focal company itself;
   - receives the necessary technical assistance for production, reducing production costs; and
   - the opportunity to focus solely on production with resulting gains in productivity and increases in remuneration.

Following the proposal developed by Lazzarini *et al.* (2001), the partnership model coordinated by the focal company establishes three types of interdependence between the agents: the first is group interdependence between the farmers raising the backgrounding steers and the owner of the certified farm; the second is the sequential interdependence between the farmers raising the backgrounding steers and the focal company; and the third is the reciprocal interdependence between the owner of the certified farm and the focal company.

The partnership model identified in this work points to a trend in the development of new coordination arrangements in the production chain of Brazilian beef. The partnership/structure model of governance analysed is designed to reduce both the costs of obtaining information on raw material through traceability and also other transaction costs through contracts used between the focal company and the owner of the farm and between the focal company and the cattle farmers. The partnership arrangement also has the objective of encouraging investments in quality in cattle raising and ensuring the supply of quality cattle for the focal company, in addition to potentially increasing the profitability of all agents involved. It is important to stress that no similar partnership arrangements were found in the literature for the beef production chain in Brazil, indicating that it is an innovation in relations between meat processing plants and cattle farmers.

The governance established above was not sufficient to meet the demand of the focal company for certified animals. To do so, the company had to establish a second type of governance for transactions (transaction T8) with other cattle farmers, whose farms were also certified. This governance is characterised by the use of forward contracts, whose advantages and design have already been explained. However, in the case of purchasing cattle to meet EU demand, there are two basic conditions in the design of these contracts. The first condition is that the cattle raising farm must be listed on TRACES, in other words, it must be duly certified for export; and the second refers to the price for fattening, which could be defined as a bonus, and is known as the Europe premium.

Marginally, the focal company can also purchase animals from certified farms through the spot market (transaction T9) to serve the EU. This governance mechanism would not be the most suitable in this case, given the high specificity of the asset traded. However, these transactions become feasible when the focal company conducts a large number or high frequency of transactions with certain cattle farmers, thus creating an environment of trust, and making forward contracts unnecessary. Although these transactions are carried out on the spot market, the Europe premium is also paid.

The strategy of adopting plural forms for the supply of animals enabled the focal firm to obtain greater flexibility and reduce the risks associated with meeting EU demand. In fact, the demand from the EU for traceable beef in Brazil has been unstable, whether due to factors related to changes in the income of the European consumer or embargos associated with technical barriers to trade. Faced with a sudden fall in demand for Brazilian beef, the focal firm ends their purchase operations for traceable finished steers on the spot market, or removes the Europe premium offered on these operations. In this way, the firm avoids the costs associated with *ex post* changes in the institutional environment. However, it is not able to avoid these costs in operations involving partnerships or forward contracts for traceable cattle. Even if the firm is able to redirect the surplus to other commercialisation channels, it is unlikely to obtain premium prices that justify the adoption of such forms of governance. Against a backdrop of rising European demand for Brazilian beef, the opposite occurs. The focal company sustains its purchase operations using the partnership model and forward contracts, and can also expand its purchases using the spot market. In this case, the Europe premium tends to rise until the supply of traceable cattle adjusts to the new demand. The adoption of plural forms of governance allows the focal company to meet the requirements of the EU in terms of beef quality attributes, without having to internalise production, bear the burden of all the production costs or lose the incentives offered by the market upstream.

4.4 Other countries

The distribution channels of foreign markets that do not require a traceability system like the European one are served using T3 transactions. In these transactions, guarantees are offered by the Official Veterinary Services, by means of a declaration from the producer attesting to the rural property origin of the animals and supervised by the Official Veterinary Service. The principal demands are limited to requirements of the Export Health Certificate, which includes, for example, that the animals must be less than 30 months old (Vinholis and Souza, 2010).

To serve the foreign market distribution channels regarding T3, the focal company purchases animals through the spot market (T6) and forward contracts (T7), and from their own farms (T5). Since these distribution channels do not require EU standard traceability, the asset is much less specific than the asset for that market. However, efforts are made by the focal company to obtain the highest quality raw material to serve these channels, given its strategy to increase competitiveness in the foreign market. In transactions using forward contracts and vertical integration, as just mentioned, there is the possibility of reducing transaction and measuring costs and encouraging investment in the quality of raw material through the promise of future transactions and payment of premiums, in the case of high quality cattle. In the transactions carried out on the spot market, quality control and incentives for investment in quality are reduced.

The supply strategy to serve the distribution channel represented by other countries (transaction T3) is very similar to the strategy for serving domestic market retail chains (transaction T2). In both cases the focal firm uses the spot market in conjunction with other forward contracts and, sporadically, vertical integration. As already emphasised, there are three advantages derived from the use of this supply strategy that became evident in the present study: i) greater flexibility in adjusting to changes in demand; ii) ability to take advantage of synergies, making use of the pre-determined scale contained in the forward contract to increase bargaining power and pay lower prices on the spot market; iii) a decrease in information asymmetry in the transactions using vertical integration, enabling the acquisition of more knowledge about the production of the raw material, and consequently more control over the suppliers of raw material.

4.5 Complexity and strategy

The classification established by Menard (2011) allows us to conclude that the plural forms adopted for the upstream transactions were determined by the complexity of transactions in certain commercialisation channels, as well as the strategic behaviour of the focal firm. Table II presents the role of each of the determinants established by Menard (2011).

To meet the demand of barbecue houses, the focal firm does not adopt plural forms of governance for the supply of raw material. In the case of retailers in the domestic market, the adoption of plural forms upstream is determined by the supply strategy of the firm. These transactions present neither ambiguity nor complexity. The use of plural forms is a strategy for securing in advance a part of the supply of animals, by adopting forward contracts, and, simultaneously, reaping the benefits of the spot market. Cross-learning effects are also an advantage of this strategy.

To meet the strict requirements of the EU, the adoption of plural forms is mainly the result of the complexity of the transactions upstream. The inherent uncertainties of the institutional environment and the need to obtain traceable animals of high quality make these transactions complex and risky. The focal firm uses plural forms as a way to keep these factors under control. In the case of other countries, the adoption of plural forms is determined by the strategy of the firm. In this case, the supply strategy is similar to the strategy adopted to serve retailers in the domestic market.

5. Final considerations

The present case study showed that the governance structures in the transactions between cattle farmers and meat processing plants change according to consumer demands and institutional environment. Plural forms of governance were adopted as a strategy for coordinating transactions and because of the complexity of some transactions. The focal company uses different forms of governance with their suppliers to serve different distribution channels in an effort to take advantage of the synergies that the different forms provide and to keep uncertainties about the quality and quantity of raw materials under control. The company uses the spot market, hybrid forms and vertical integration to purchase cattle. This strategy provides a competitive advantage, since it allows the company to serve different distribution channels, with different levels of requirements in terms of quality and other product attributes. It reduces the risk of depending on just a few suppliers by diversifying supply strategies. It also reduces the risk that comes from complexity and unpredictable institutional environment in the international market.

Distributions channels	Determinants of plural forms in upstream transactions Ambiguity	Complexity	Strategy
Domestic market			
Barbecue houses	0	0	0
Retailers	0	0	++
Foreign market			
EU	0	++	+
Other countries	0	0	++

Notes: In this table, 0 means that the relevant variable does not seem to play a significant role in the choice of the plural forms of governance, + signals that the related variable has a moderate influence, ++ indicates a major determinant

Table II. Determinants of plural forms in upstream transactions

The adoption of plural forms allows the company to improve its planning and control of supply, with consequent gains in the use of installed capacity. The strategy of adopting plural forms also appears to be gaining ground in other companies and in other sectors, and deserves further in-depth study. This study is novel in pointing out the advantages that this strategy can provide based on a case study carried out at a large company of the beef industry that serves different distribution channels with differentiated products (in terms of quality and packaging/cuts).

Most empirical studies on plural forms evaluate their existence within a sector or production chain, without wondering whether plural forms exist within a single company. Furthermore, most of these studies do not take into consideration the impact that the differentiation of product and distribution channels can have on the adoption of plural forms of governance when make their evaluations. In fact, the analytical model used in these studies implicitly presumes that the companies offer a single homogeneous product and must decide on the form of governance to be adopted for the supply of the most important input (upstream transactions) (Heide, 2003; Parmigiani, 2007; Mello and Paulillo, 2010). This simplification of the real world leads these studies to disregard the effect of differentiation of product and distribution channels on the supply strategy that the company is following. Also, these studies do not take into account the role played by a given and pre-existing heterogeneity of input suppliers. In the present study it was found that both the specificity of the final product, as well as the availability of a wide range of suppliers of raw material, employing different production technologies, are determinant factors for the focal company adopting plural forms.

The case study presented here corroborates the vision that plural forms of governance are aligned with the model provided by Menard (2011). In the case presented, plurality is more efficient than the adoption of only one form of governance. This can be explained by the complexity of some transactions, by the different characteristics of the assets involved and by the supply strategy of the company. Plurality is not a situation of disequilibrium, but rather a question of multiple equilibria found to efficiently serve the diversity of existing distribution channels. It is possible to set price and quality strategies, and ensure the flexibility needed to face uncertainties about the quantity and quality of production, as suggested by Brousseau and Codron (1997), Silva and Azevedo (2007), Perrigot *et al.* (2009) and Menard (2011).

The adoption of plural forms of governance allowed the Brazilian beef export industry to match the heterogeneity in the supply of beef cattle in Brazil with the heterogeneity of the beef market in both domestic and foreign markets. This strategy has provided competitive advantages for the Brazilian beef chain in the international market.

Notes

1. The ESALQ/BM&F indicator is a price indicator calculated by the Center for Advanced Studies on Applied Economics (CEPEA) of the University of São Paulo (USP) and the Mercantile & Futures Exchange (BM&F).
2. Brazilian Tracing Service for the Cattle and Buffalo Production Chain.
3. These farms, in addition to tracing all animals, must also be audited and certified by the Ministry of Agriculture, and listed on TRACES.

4. The animals that will be slaughtered and sent to the EU must remain on a certified farm (Rural Establishment Approved in the SISBOV – ERAS) for a period of 90 days before being shipped to the meat processing plant. Before this 90-day period, the animals can be raised on uncertified farms.
5. In Brazil, the cattle production cycle is traditionally composed of three production phases: pre-weaning, post-weaning and finishing. These phases can be carried out separately on different farms or on the same farm. The pre-weaning phase requires the largest amount of land per animal. Therefore, this phase is normally carried out in regions where the land cost is lower. The finishing phase, on the other hand, can be more capital intensive and requires less area per animal, therefore, it is economically viable in regions where the cost of land is higher.

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