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*Full Length Research Paper*

# Governance and transaction costs in the sheep production chain in Rio Grande do Sul, Brazil

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**The increase in the demand for quality meat has created an organizational process for sheep farmers in Rio Grande do Sul, Brazil. These initiatives have turned possible the beginning of chain coordination actions, forming new governance structures. The aim of this study was to analyze the governance in the sheep production chain in Rio Grande do Sul, and to identify the main transaction costs in the farmer-industry relationship. The methodology used was based on case studies, using theoretical support from the transaction costs economics. Two governance structures that orient the transactions were found: market and horizontal coordination. Market coordination is characterized by the supply of commodity products, great number of consumers and traders and the inexistence of formal contractual relations. Horizontal coordination created an increased in the scale of slaughter animals originated from informal contracts between the production sector and the industry. In the market coordination, low asset specificity, smaller transaction frequencies and a higher level of uncertainty *ex ante* transactions could be observed. In the horizontal coordination, a medium rate of asset specificity, a higher frequency and an elevated level of uncertainty in *ex ante* and *ex post* transactions were perceived.**

**Key words:** agribusiness, agricultural economics, transaction costs.

## INTRODUCTION

Sheep farming is one of the main farming activities developed in Rio Grande do Sul. Its commercial use began in the beginning of the 20th century, with wool appreciation in the international market and, since the beginning of the 1940's, with technological advancements in the production sector. The activity passed through periods of progress and downfall; however, the sheep farming tradition consolidated itself in the Southern region of the state, as an activity usually linked to beef cattle production.

The biggest period of downfall started in the end of the 1980's due to the high supplies of Australian wool and the beginning of the commercialization of synthetic fibers in the international textile market. The crisis extended itself throughout the 1990's, which made many farmers throw away the activity, reducing significantly the commercial flock, causing the destructuralization of the production chain. However, the increase in the purchasing power of the population and the increase in the number of young animals slaughtered opened a new market to sheep farming.

The restructuring of the activity was propelled by the

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**Abbreviations: NIE,** New institutional economics; **TCE,** transaction costs economics; **PGPM,** policies to maintain minimal prices.

elevation of prices paid for lambs since 1995. Souza et al. (2006) highlight that the prices paid for farming products in Rio Grande do Sul, at farmer level, presented stability between the years 1995 and 2004, also except prices paid per kilogram of sheep and lamb, which point to increase in this segment in the same period.

The difficulties in commercializing and the rise in demand for quality sheep meat generated a process of farmer organization in different cities and regions of Rio Grande do Sul with the purpose of obtaining competitive advantages facing opposing production chains. These initiatives facilitate the beginning of a chain coordination process, establishing new governance structures. Consequently, the transactions stop being exclusively market transactions, also being able to operate in hybrid forms of governance.

The organization and management of these production chains are the major challenges; nevertheless, they may be the only alternatives so that goat and sheep farming may assume roles that generate employment, income and social welfare. The growth and sustainable development of the activity should be focused on organizational arrangements, and if at all possible, those that privilege partnerships through contracts with slaughterhouses and tanneries and/or production and commercialization unions. The implementation of programs that seek to improve the quality of goat and sheep products, especially those which favor marketing have the most importance, and should be implemented in a systematic way and in accordance with the interests of farmers and agroindustries (Simplício and Simplício, 2007).

Silveira (2005) highlights relevant aspects to the study of coordination in the sheep production chain: the socio-economical potential of the activity in the southern region of Rio Grande do Sul; the traditionalism of the activity among the farmers, which developed appropriate production skills and technologies; the presence of natural resources available and the favorable environment for sheep production; the need to recover the agricultural sector in the state; and essentially, the growing demand for quality sheep meat, which translates into an almost unexplored market opportunity.

The studies and researches that define the structure and characterize the various types of coordination in production chains, mostly those linked to the sheep production chain are still very restrict. Delimiting the sheep meat agroindustrial system in a wider sense, according to Silva (2002), is very complex, due to the specificities and spatial distribution of the production.

The new configurations of inter-organizational arrangements observed in the hybrid governance structures, especially in the agrifood sector, effectively suggest an important study field aiming for a better understanding of the nature of the relationships established and the dynamic functioning of these arrangements (Arbage, 2004). Besides, different forms for understanding the dynamic of the agribusiness relations are rising from academic literature (Talamini and Ferreira, 2010).

New farmer associations emerge throughout the state; as a consequence they are being able to attend the demand of slaughterhouses, raising the number of slaughtered animals. These associations are responsible for the appearance of new market arrangements. Studies that seek to identify the new arrangements will contribute positively for future interventions that aspire to increase market competition in the chain, as well as stimulating and serving as a basis for future research.

The cities of Santana do Livramento, Dom Pedrito and São Gabriel outstands in the sheep farming tradition. Both forms of coordination established around these cities can provide orientation and stimulus for all the sheep production chain in Rio Grande do Sul. For this reason the importance of carrying out study cases is in better comprehension of the relationship between farmers and industries, which need better analysis to the historic absence of cooperation between these two segments of the production chain.

In this sense, the aim of this study was to analyze the governance of the sheep production chain in the Southern half of the state of Rio Grande do Sul and to pinpoint the main transaction costs in the farmer-industry relationship.

## NEW INSTITUTIONAL ECONOMICS AND THE TRANSACTION COSTS ECONOMICS

The new institutional economics (NIE) is divided in two analytical levels: institutional environment and governance structures, contemplating macro institutions, establishing the basis for interpersonal relationships, and micro institutions, which regulate specific transactions (Azevedo, 2000). The author reports the growing interest in the study of the institutions, mainly in what refers to the organization of agricultural activity. In game theory, institutions can restrict the interaction costs between economical agents being this relevant for economical efficiency and development.

The coordination of productive chains has been a major theme in the new institutional economics, particularly in one of its branches: the transaction costs economics (TCE) (Nogueira, 2003, p.17). The academic chain called governance structure or TCE has as its main reference in the studies developed by Williamson (1975, 1985, 1996).

In the study of economical organization, the TCE is the most micro analytical, more consistent about its behavioral principals. It introduces and develops the economical importance of advantage specificity, makes use of comparative institutional analysis, sees business agreements as a governance structure rather that a mere production function and puts more emphasis on the institutions (Williamson, 1985).

The potential to make agreements, supported by institutions, has the power to reduce transaction costs and production costs inside a firm (North, 1991). Transactions costs are the *ex ante* costs of planning, negotiating and safekeeping an agreement, plus the *ex post* costs of the adjustments made and of the poor adaptation and execution of a given contract, due to gaps, errors, omissions and non-anticipated disturbances; the costs of operating the economical system (Williamson, 1996).

Transaction costs are simply the costs of making any exchange, being it between firms, in a market formation or transferring resources in a vertically integrated firm, whereas the neoclassic supposition argues the existence of perfect information without costs (Hobbs, 1996).

Coordination is not an intrinsic characteristic of production systems, but a result of a construction of economical agents. Aiming at reducing transaction costs, the agents make use of appropriate mechanisms to regulate transactions, called "governance structures" (Williamson, 1985).

According to Williamson (1996), a governance structure is the institutional matrix inside which an entire transaction is determined. In the commercial sector, three discreet alternatives for governance structures are known: classic market, hybrid forms and hierarchy. The governance structure of a certain transaction is determined by the attributes of the transaction, by the institutional environment and by the behavioral assumptions made by those involved (Alam, 2009). From these characteristics the most efficient governance structure of a transaction is consolidated, aiming at diminishing costs related to the operation of the system.

## Behavioral assumptions

### *Bounded rationality*

Rationality is a behavioral supposition of the TCE, and is segmented, according to Williamson (1985), into: i) maximization, ii) bounded rationality and iii) organic rationality.

The first concept affirms that individuals are able to absorb and process all of the information available, maximizing its objectives. This is the concept of rationality on which the neoclassical thinking is based. The second concept, bounded rationality, developed by Simon (1955), built, alongside opportunism, the foundations of the TCE. Individuals act rationally, but in a limited way. Thus, the obtaining of necessary information and the capacity to process complex problems are limited, that is, rationality becomes scarce, being that its use implies in more costs. Organic rationality assumes that individual rational capacity is not enough to choose an institutional framework with the object of lessening contractual problems (Farina et al., 1997).

Bounded rationality means that, although people can intend to make rational decisions, their capacity to evaluate precisely all of the alternatives is physically limited. Bounded rationality presents a problem only in complex situations and those of uncertainty, when the ability to make a completely rational decision is impaired (Hobbs, 1996).

For Williamson (1975), bounded rationality involves neuro-physiological limitations and language limitations. People have a limited capacity to receive, store, reestablish and process information without errors. Language limitations refer to the incapacity to articulate knowledge through the use of words, numbers or graphs, in a way that can be understood.

### *Opportunism*

Three levels of search for self-interest can be discriminated: the weak form, denominated obedience (completely null); the simple search for self-interest, denominated semi-strong form; and the strong form, in which the TCE is based, denominated opportunism (Williamson, 1985).

In business, individuals sometimes seek to explore a situation in order to obtain advantages, which can be characterized as opportunism. This behavior cannot be generalized for all of the agents involved in a transaction, nonetheless the risk of opportunistic behavior is frequently present (Hobbs, 1996).

Opportunism extends the conventional supposition that economical agents are guided by self-interest obtained with malice, which generates deep implications for the electing of alternative contractual relations (Williamson, 1975).

When outlining the literature about information economics, the TCE recognizes that many transactions are characterized by incomplete, imperfect or asymmetrical information. The asymmetry of information can lead to opportunistic behavior in two ways: when information is not clear and transparent before the transaction there is *ex ante* opportunism, and after a transaction which contains asymmetric information, individual or company actions can lead do *ex post* opportunism, being this type of behavior characterized by "moral risk" (Hobbs, 1996).

## Transaction attributes

The TCE affirms that there are rational economical reasons to organize certain transactions. The theory requires that the factors responsible for differences among the transactions be identified and explained. The main dimensions that affect the way transactions are made and influence the behavior of transaction costs are: asset specificity, frequency and uncertainty. Asset

specificity has a prominent role in the TCE, being the most important dimension of economical organization. The uncertainty and frequency complement asset specificity, contributing significantly to the differences between transaction forms (Williamson, 1985).

### *Asset specificity*

Asset specificity refers to how specific the investment made is to the activity and how expensive its alternative use is in another situation (Williamson, 1985).

It is a specialized investment which cannot be relocated for alternative use or alternative users, except in a loss of productive value. Asset specificity creates bilateral dependence, and can generate complications in contractual relations. According to this, such investment will only be made in order to contribute to the reduction of production costs and propitiate increase in the income (Williamson, 1996).

The specificity of assets involved assumes the role of a key variable in the TCE. Assets are specific if the flowback associated to them depends on the continuity of a certain transaction. The more specific the asset, the bigger the loss associated to opportunistic actions made by other agents. Consequently, the higher the transaction costs in the exchanges (Farina, 1999).

According to the TCE, Williamson (1996) considers the existence of six types of asset specificity: local specificity, physical assets specificity, human assets specificity, dedicated specificity, brand specificity and time specificity.

### *Frequency*

Frequency is a characteristic associated to the number of times that two agents make a certain transaction. The repetitive mode of transactions may result in the emergence of reputation, which carries a lower level of opportunism and better coordination efficiency.

The cost of specified governance structures will be easier to recover in reoccurring transactions. Consequently, the frequency of transactions is a relevant dimension in the TCE analysis (Williamson, 1985).

The analysis of the analytical category “frequency” occurs simultaneously to asset specificity being that they compose, together with uncertainty, the “transaction attributes”. When a certain type of asset is requested, there must be some return in terms of frequency of transactions so that the investment made can be paid off faster. It seems unreasonable that a certain production that requires an idiosyncratic investment be supported by a low frequency pattern of transactions. Thus, the TCE shows that, when relating specific investment levels with transaction frequency patterns, a governance structure that minimizes transaction costs can be established (Arbage, 2004).

### *Uncertainty*

Uncertainty is related to the lack of predictability of subsequent attitudes of economical agents and with the lack of knowledge of elements related to the economical and institutional environment. In the organizational field, the main source of risk comes precisely from bounded rationality. If it were not for this aspect, governance structures would be able to adjust to environmental changes. There is a second source of risk which is also related to behavioral aspects: opportunism. The acceptation of the presupposition that the agents can behave in an opportunistic way places an aspect of uncertainty in commercial relations, since there is no way to predict the exact behavior of the agents even after making contracts (Arbage, 2004).

Uncertainty has a main role in the enlargement of gaps that a contract cannot cover. In an environment of uncertainty, the agents cannot predict future happenings and so the space for renegotiation is bigger. Being this space larger, greater are the possibilities of losses derived from opportunistic behavior from either parties, or even of the disagreement between them (Farina, 1999; Azevedo, 2000).

The increase of the level of risk will not alter the organization of commercial relations in which the transactions are non-specific, and continuity has little value. Exchanges in continuous market (classic contract) maintains itself through patterned transactions whatever the level of risk. However, uncertainty can cause alterations in governance structures, like investments of specific transactions. When the investments are idiosyncratic, raising the level of risk makes the investment more imperative, requiring more attention to function well, creating larger contractual gaps and occasion for sequential adaptations. Bilateral governance structures can frequently give space for unified ones when uncertainty levels rise in recurrent transactions (Williamson, 1979).

## METHODOLOGY

As suggested in Alam (2001), the methodology used in this work was based on case-studies, with techniques of bibliographical research, direct observation and semi-structured interviews with farmers, slaughterhouse production managers and key-members of the organizational environment.

The case study considered the cities of Dom Pedrito, Santana do Livramento and São Gabriel, which represent 36% of the regional flock of sheep and 19% of the total in the state. The sheep farming tradition is rooted in these cities, and alongside beef cattle farming and rice production is one of the main economical activities in the region. According to Yin (2005), using case study as a research

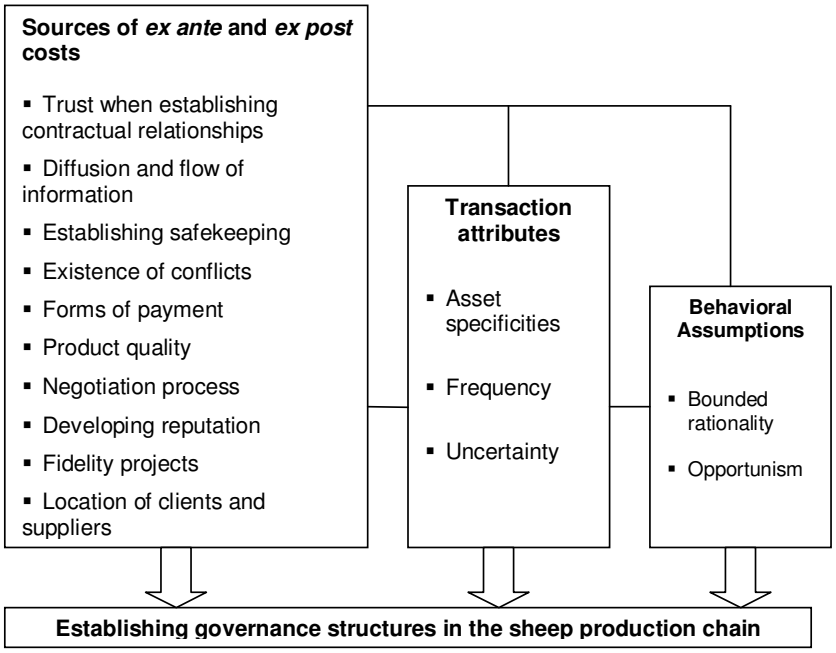


**Figure 1.** Analysis diagram for the identification of governance structures of the sheep production chain and its conditioners. Source: made by authors based on the assumptions of the TCE.

strategy enables the understanding of individual, organizational, political and group phenomena. The need for case study emerges from the wish to understand complex social phenomena.

During case study, when developing field studies, there is the possibility to make direct observations. These observations enable the understanding of some types of behavior and relevant conditions for study, complementing the data collected (Yin, 2005). Observation is a data collecting technique which makes it possible to obtain information and examine facts or phenomena which one wishes to study. It creates a more direct contact of the researcher with reality, enabling to evidence data which is not in interviews or questionnaires (Lakatos and Marconi, 1986). Thus, it was sought to experience the sheep production chain through participation in the production process, collecting information about the commercialization process of these products and observing the market structure in which the agents are in.

During the collection of transaction costs, special attention was drawn to the analysis of the farmer-industry link, a relation considered primordial in chain coordination. Direct contact with agents in the sheep production chain was made through a semi-structured interview with open questions which according to Lakatos and Marconi (1986) is an important tool in the field of social sciences, for it enables the diagnosis of a particular problem through questions without a formal structure.

The interviews followed the model proposed in the analysis scheme for identification of governance structures (Figure 1) and were made with producers from the cities of Dom Pedrito, Santana do Livramento and São Gabriel, members of the Tejupá cooperative in São Gabriel and production managers of three important slaughterhouses in Rio Grande do Sul.

The interviews were guided by the topics: types of contractual relationship, existence of trust, information exchange, types of commercial products, frequency of transactions, characteristics of the market, requirements in relation producer-industry, specific assets involved, relationship with organizational environment, existence of conflicts, actions pro-coordination, risks and uncertainties, etc.

From the obtaining of relevant information through interviews, an analysis of the main *ex ante* and *ex post* costs of the farmer-industry relation, transaction attributes (asset specificities, frequency and uncertainty) and behavioral assumption (bounded rationality and opportunism) was made, added to the data collected with the assumptions of the TCE (Figure 1).

## RESULTS AND DISCUSSION

### Market governance in the sheep production chain

The main governance structure identified in the sheep production chain in the South of Rio Grande do Sul is via market prices. The properties located in the cities of Dom Pedrito and Santana do Livramento make transactions with industries mainly via market. The commercialized products are the type of low specificity and there is no contractual relation between parties. The agreements are free and price mechanisms guide transactions. Through market relationships, the *ex ante* costs of the formalization of transactions, negotiation process and establishment of safekeeping are low, seen that the industries act freely in the market without the object of creating a closer relationship with farmers.

The interest of the industries is based on price policies,

instead of privileging long term relationships with farmers, which causes low negotiation and safekeeping costs. In the same way, the industry is not worried in teaching farmers what to produce, because low specificity assets are required (any animal category), not establishing information flow.

The *ex ante* costs in this relation are represented by the location of the clients and suppliers, seen that when acting in the market, without any kind of contract, informal or formal, industries end up spending more on looking for suppliers to obtain animals for slaughter. The industry ends up having elevated costs to obtain animals for slaughter during the period from July to October, due to low animal supplies in the regional market, forcing slaughterhouses to import animals from Uruguay to maintain regularity and the ability to maintain agreements with clients downstream.

The *ex post* costs of the industries are low, for it is not necessary to establish agreements with farmers, being that there is no need to establish reputation between either party. The post transaction costs, of maintaining the agreement to distribute meat to retailers is present in the industries. The industry is concerned about maintaining agreements with retailers, for it depends on them to maintain itself on the market. Their main purchasers are located in the southeastern region, needing to maintain a place for distribution in the state of Paraná, which elevates the post-transaction costs.

After describing the governance structure used, a comparative analysis is made, considering the transaction attributes, a) asset specificity, b) frequency and c) uncertainty with the governance structure.

### *Asset specificity*

Specificity of physical assets: The animals which are dealt in the farmer-industry relation should be up to 18 months old, with no other requisite. However, the industry slaughters any animal category, not requiring any kind of specific product from the farmer to consolidate the transaction, which characterizes low physical asset specificity.

**Dedicated specificity:** The investments in assets for the production process are as low for the farmers as for the industries. As the physical assets specificity is low, the producers do not invest any more than necessary to produce the products, financing only the basic production processes. The industries use the same infrastructure for slaughtering beef cattle as for slaughtering sheep, with no adaptation of the environment for exclusive use for sheep slaughtering, demonstrating low dedicated specificity.

**Human asset specificity:** The lack of interest in investing in new production processes and the production of low specificity products increases the number of unskilled laborers. In general terms, there is skilled labor in beef cattle slaughtering, being that sheep slaughtering is only a small part of the production of the industry, and thus the human asset specificity is low.

**Brand specificity:** The interest in consolidating a brand is present in the industry due to the desire to reach new markets in different regions of Brazil. Consequently, brand specificity is average.

**Local specificity:** The industries have costs with transportation, then again, the distance for animal reception is small, seen that animal acquisition is made in farms near the slaughterhouse. However, in some industries the costs of product distribution is bigger due to the implementation of other spots for distributing meat in the southeastern region. Thus, local specificity is average to low.

**Time specificity:** Sheep meat is a perishable product; though meat processing is considered fast, it takes 48 h from the moment the animals are loaded into the truck up to the moment when the meat is stored in cold chambers. Time specificity is considered low.

Considering the specificity characteristics described, asset specificity in the relationship between the producers from Dom Pedrito and Santana do Livramento with the industries is low.

### *Frequency*

Frequency is associated to the number of times that two agents make a certain transaction. Slaughterhouses slay about 1400 sheep per week, a level considered usual. Since the parts are placed in a market structure, the number of transactions between the industries with the same farmer is low, with no more than two annual transactions. With a low level of transactions between them, there is no consolidation of reputation, and there is no interest by any of the agents.

### *Uncertainty*

Uncertainty is present due to the fact that the agents present bounded rationality. However, the level of uncertainty is not high, seen that the farmer-industry relationship of the classical market and the agents have no interest in formalizing long term agreements and creating reputation. Therefore, opportunistic behavior is lessened, being restricted only to what refers to the ability of the industries to pay for the products, and the ability of the farmers to supply the product se t in the transaction.

Conflicts between parts have already happened due to late payments by the industries, which made the level of uncertainty of the farmers rise in future transactions. Currently, ready money is required. Another risk is in the transactions made with payment through carcass weight. Since the value is only known after slay, and the farmer cannot take part in the procedure, the industry could act in an opportunistic way, presenting to the farmer a lower value than actually found. Nevertheless, this type of transactions is very infrequent, being that they are avoided by a great deal of farmers due to the possibility of opportunistic behavior.

From the description of the *ex ante* and *ex post* costs of the transaction attributes and of the behavioral assumptions, the transaction costs between farmers, located in the cities of Dom Pedrito and Santana do Livramento, and the industries are low. Thus the classic market governance structure is able to manage transactions between parts. In other words, the transactions are characterized by the supply of a commodity product, with relatively low frequency, to reach market niches. There is a free search for suppliers, which is enough to fill the needs of the industry, generating low transaction costs. Uncertainty is present, but can be managed by both parties being in a classic market structure. Thus, market is the arrangement able to provide the making of transactions.

## Informal horizontal coordination in the sheep production chain

The new challenge in the sheep production chain is to offer young, quality animals all year round, in the right quantity to supply for the consumer market. Accordingly, this scenario brought the need for an adaptation in the sheep production systems so that a product with those characteristics can be offered. The new predicted requirements for the market have influenced on the specificity of the products produced and on the need of a higher frequency of transactions as a result of a rise in sales, which made transaction costs rise through market governance.

In this context, horizontal coordination was established, represented in this study by the transactional relations between farms in the cities of São Gabriel linked to the Tejupá cooperative, an important company in Rio Grande do Sul. The transactional arrangement was installed in 2005 with the objective of supplying two hundred sheep every fifteen days for the local slaughterhouse. In 2007, the organization had two hundred farmers which sent 1400 sheep every week to the same slaughterhouse. Horizontal coordination only became possible due to the direct performance of the organizational environment, that is, the performance of the local cooperative, associated to institutions like SEBRAE, SENAR, rural syndicates and research institutions. The implementation of a new coordination arrangement was only made possible due to the pressure made by the rise in the cost of the sheep production chain. In order to better evaluate these costs, it is necessary to observe how the organization (cooperative) worked in the earlier form of wool commercialization up to the mid 90s and in the present form, commercializing meat and wool.

The cooperative had as its main objective to receive wool produced by the local farmers and commercialize with processing industries. The product had low specificity, transactions involved risk and their frequency was low due to the supply only in the production season. The relationship between farmers and industry was merely commercial, with no other intervention in the production segment. These aspects brought a low transaction cost in the relation between segments though market governance. During the 1970's and 1980's, the cooperatives benefited from programs to support commercialization, like Government Loans (EGF), obtained through policies to maintain minimal prices (PGPM). Through the withdrawal of these support policies in the 1990's, alongside the wool crisis in the international market, the cooperatives had to adapt to new market circumstances. The sheep production crisis brought the need for farmers to invest in another vendible product: lambs. This way, the production would not only be linked to wool. The role of the cooperative changed in the sense that it had to assist farmers on how to sell animals for slaughter, making intermediations with the industry, as well as the former process of commercializing wool.

This adaptation process resulted in the rise of transaction costs of the chain due to the fact that the industry demanded a more specified product and more frequently. Opting for a hybrid form of coordination (horizontal coordination) is evident since a rise in the frequency of transactions, uncertainty and asset specificity could be observed.

The formalization of transactions and the negotiation process between parties generates costs, seen that the contract foresees frequent transactions and with the same cooperatives. This formalization passes through informal agreements between the industry and the organizational environment (cooperative), which regulates negotiations with farmers.

Horizontal coordination, as an informal character, has not established safekeeping for the transactions. Nonetheless, what maintains the informal agreements are the moral values, reputation and the agreement between parties. The search for a more specified product brought the need to assist farmers in producing the desired product. This *ex ante* cost is represented by a series of meetings which seek to exemplify the product that the industry needs and the possible ways of obtaining it, establishing a high information flow between parts. Costs with the evaluation of the animals for slaughter in order to

certify the specificity of the product required are other *ex ante* costs executed by the industry.

The interest of the industry in increasing the number of animals for slaughter and in processing a specified product brought the following question: how can farmers be capable of producing such a product and how can it be located with high frequency? If it depended only on the market, the industry would have elevated *ex ante* costs related to supplier locations. However, horizontal coordination lessens such costs, since they establish an informal contract of sheep supply all year round, with the product, pre-established frequency and guaranteed precedence.

The *ex post* costs of the relation are presented by the efforts made to maintain the informal contract set. Negotiation costs, adaptation of the transactions and information flow are exercised to maintain the governance structure established. Meat processed by the slaughterhouse is distributed to supermarkets in São Paulo, Rio de Janeiro, Paraná and Pernambuco. There are formal distribution contracts with retail market chains, with pre-established amounts of meat to be delivered and frequency. Thus, maintaining the formal agreement with farmers, the interest in creating reputation with them and the development of means to avoid opportunistic behavior are characteristics which elevate costs.

After describing the governance structure used, a comparative analysis was made, considering the transaction attributes, a) asset specificities, b) frequency and c) uncertainty with the governance structure.

### *Asset specificity*

Specificity of physical assets: the animals which are dealt in horizontal coordination are required to be, according to the industry, three to eighteen months old, weighing between 25 and 45 kg, with a body score between 3 and 4 and sent to evaluation by technicians paid by the slaughterhouse. This type of animal, characterized in the horizontal coordination as a physical asset of medium specificity, is different from the type of animals commercialized in the classic market, which do not present any requirement regarding the quality of the carcass.

**Dedicated specificity:** the investments of the industry in assets for meat processing were high. Unlike the industries of market governance which use beef cattle slaughterhouses for slaughtering sheep, the horizontal coordination industry made investments in adapting the slaughterhouses for exclusive use for slaughtering lambs. There was also an investment in assets made by the farmers. Investments in pasture, food supplements and more rigorous sanitation measures were made by the farmers in order to offer the animals demanded by the industry. This way, from these characteristics, dedicated specificity is high.

**Human asset specificity:** Since the sheep slaughterhouses of the industries operate daily, processing sheep meat exclusively, skilled labor is needed. In the farms, horizontal coordination brought the need for more care with the flock of sheep. One of the difficulties reported by the farmers is in obtaining skilled labor for managing the animals. Thus, after establishing an informal agreement, the farmers have been searching for skilled labor in order to produce the new specified assets required.

**Brand specificity:** The interest in consolidating a brand is present in horizontal coordination. The slaughterhouse wishes to establish a brand for processed sheep meat, highlighting the quality of the product, through the denomination “young lamb”, aggregating value and reaching market niches in the southeastern region. The supermarket chains, which maintain contracts with the industry, look for such type of sheep meat, for they will be commercializing a quality product with a differential.

**Local specificity:** The need the industry has to obtain specific products frequently would generate high costs in obtaining animals from various regions in the state, raising the costs of transportation. However, horizontal coordination, with farmers organized, enables the industry to obtain the wanted products with the frequency needed, minimizing transportation costs. The costs are more elevated with the meat distribution to retails, seen that the supermarket chains are in the southeastern and northeastern regions.

**Time specificity:** Time specificity is considered low, which is similar to the market structure. Sheep meat is a perishable product, but meat processing is considered fast, since from the moment the animals are loaded into the truck up to the moment when the meat is stored in cold chambers, only 48 h have passed.

Considering the characteristics here described the specificity of assets in the relationship between the farmers in organization and the industry, horizontal coordination structure, is considered average.

### *Frequency*

The frequency of transactions between the industry and the farmer organizations is significant. The slaughterhouse handles 1400 sheep per week with the same organization. The farmers, contrary to the farmer in the market structure, make regular transactions with the slaughterhouse, due to the fact that in a farmer association a high number of sheep is not needed for

**Table 1.** Aspects of the transaction costs economics (TCE) in the two governance structures between farmers and the industries analyzed.

| TCE Aspects | Governance between farmers- industries | |
|---|---|---|
| | **Market** | **Horizontal coordination** |
| Asset specificity | Low | Medium |
| Frequency | Low | Medium |
| Uncertainty | Average | High |
| Opportunism | Low | High |
| Bounded rationality | Present | Present |

Source: Data collected in the research.

commercialization. Thus, sheep farmers can commercialize only the animals that fill the requirements, without worrying about having a high number of animals available. The production efficiency rises, for the animals that are not ready do not need to be commercialized immediately, on the contrary, they can be commercialized when they are ready in order to obtain better return.

### *Uncertainty*

Uncertainty is present in horizontal coordination due to the informal form of contract, as well as the fact that the agents present bounded rationality. The level of uncertainty is high, for there is interest in formalizing long term contracts to create reputation, but there are no formal deals that guarantee the safekeeping of the relationship. Thus, opportunistic behavior is present in both agents, since at any moment one of the parties can interrupt the informal transaction deal. The producers can act opportunistically when receiving higher pay from other industries, exchanging the long term relationship and market regularity for price policies. The industry can act opportunistically, breaking the deal when finding other farmers that can offer the same product with lower prices. Conflicts between the parties have already happened at price levels. The stipulated price for the product us the main parameter discussed and the main point in maintaining the contract. However, formal contracts would reduce even more opportunistic behavior.

From the description of the *ex ante* and *ex post* costs, from the transaction attributes and the behavioral assumptions, it was verified that there are transaction costs between the farmers located in the city of São Gabriel, and the industry. The higher the level of the transaction attributes and the tendency for opportunistic behavior, alongside the presence of bounded rationality, the higher the need to control the transactions through hybrid structures.

Thus, the horizontal coordination governance structure was established to minimize transaction costs in the new form of commercialization. The demand for a medium specified asset, with elevated frequency and the rise in the level of uncertainty are factors which condition of the formation of the horizontal coordination. Specialized investment can be moved for alternative uses, but in the classic market it would not result in more income as in the transaction coordination arrangement. These new requirements, in a classic market, would generate high transaction costs, which could inhibit the transactions. Zylbersztajn (2005) highlights the importance of horizontal coordination, through informal agreements, as a way to win over scale economies, extending the value of organization and the potential of coordination with processing industries.

Table 1 highlights the present attributes in the transactions in two governance structures between farmers and the industries. According to the TCE, the market is a governance structure able to absorb transaction costs implicit in these relationships. Horizontal coordination foresees a change in the sheep production systems, aimed at obtaining better results at medium term. Thus, lamb production is intensified, aggregating value and inserting quality animals into the market. Coordination comes intending to create security, market regularity and generate better prices.

## Conclusions

In the southern region of Rio Grande do Sul, Brazil, two governance structures that manage transactions were found: market and horizontal coordination (hybrid form). Market coordination is characterized by the supply of commodity products, high number of consumers and sellers, defined prices based on this interaction and the contractual relation between them. The industries seek suppliers when they need raw material, being that the price mechanism and the ability to supply animals are the determining factors for carrying out a transaction.

Horizontal coordination is a new transaction arrangement established in the sheep production chain. This arrangement enabled a rise in the animals for slaughter and the frequency of transactions. The coordination is

based on informal agreements between parties, maintained through the commitment to supply a predetermined number of animals per month. In this arrangement of coordination, moral values and tradition are the basis for maintaining the relationship.

When the transaction costs in the relationship between farmers and the industry through the market were analyzed, low *ex ante* and *ex post* transaction costs could be observed. Analyzing the transaction costs between the farmers and the industry in horizontal coordination, the *ex ante* costs of the formalization of the transactions, negotiation processes and *ex post* costs of maintaining the informal agreement were observed.

Due to the lack of study about the coordination process of the sheep production chain in Rio Grande do Sul, it is relevant for future researches to analyze the structural characteristics of new transaction arrangements in various regions of the state, and to verify the influence of the institutional environment in the local progress and the restructuring of the sector.

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