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International Demand Shaping Governance Mechanisms in Brazilian Beef Agri-Systems: The Case of the Three Main Processors

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ABSTRACT

Which specific investments do the industry and the cattle producers need for their coordination in order to meet the demands of the international market and participate in it? Insertion in the international market is a multifaceted and complex theme, which represents a challenge for the market and for the research in economy of organizations, because it focuses on the systemic coordination of a certain segment for the generation of value as an organizational strategy. Through critical observation of export sub-systems, their various institutional environments and their differences from internal issues can be considered central, as this leads to specific investments to operate in these markets in uncertain environments. This gap encourages and justifies this research, which aims to present and advance the concept of agribusiness system (SAG). Specifically, we sought to identify the observed regularities of the agents involved in these transactions — specific assets invested, degree of recurrence, degree of knowledge and adaptability — internal and to the external market and to compare them. Such an analysis seeks to delimit the institutional differences, the coordinating agents of the different strictly coordinated systems. Finally, to determine the boundaries of a typical system and one that meets specific demands and the need for coordination among the agents to serve them by focusing on systems geared to the international market. Through the methodology of multiple case studies, the three largest slaughter and processing industries in Brazil and their relationship with the farmers in relation to the Sub-System Strictly Coordinated (SSSC) for export to the European Union were addressed. Among the regularities of the case studies, the emergence of SSSCs for the internal market focused on quality resulting from the process of creation of the SSSC-exporter allowed to explore the degree of organizational tolerance of the arrangements of these companies. The cases also provided findings about organizational tolerance and the relation of specific investments and quality in the chain.

Keywords: *Strictly coordinated sub-system; Property Rights; Governance Strategies; Transaction Costs; Beef-cattle agribusiness system*

1. Introduction

The Brazilian beef system faces the global market after trade barriers low down. We have conducted our study on how this rearrangement affects the agribusiness system (SAG) governance based on TCE and Property Rights theory. Prior studies have argued that different strategies and organizational governance emerge from different institutional contexts. Several changes were observed in international trade since the creation of WTO in 1995, and Brazil became one of the largest players in global agribusiness. Beef production is one of the most protected activities in some countries, mostly because it is an activity with strong representativeness of political and social interests. Since the Doha Round in 2001, many protections have been reduced and substantial reforms in the beef industry have been introduced regarding trade requirements, such as animal wellbeing, certifications and traceability (European International Center, 2003).

In the light of economic and internationalization theory, changes in regulations and requirements in international trade affect the institutional environment and, consequently, the governance structure on organizations (North, 1990, Williamson, 1985). In Agribusiness System literature, institutional shocks are related to the need of the whole system quick adaptation on the direction of a sub-system strictly coordinated (SSSC) to satisfy a specific demand (Zylbersztajn & Farina, 1999). The literature suggests that the contractual system will adapt by two methods: (1) by shaping organizational strategy; (2) with formal institutions efficiently supporting supply systems in order to enforce coordination and help implement the necessary contractual adaptations with agents involved. However, we can see differences in coordination between systems to meet international and internal demands.

In this paper, we research the challenges in coordination that SAGs or SSSCs face in regard to fulfil international European Union requirements. In other words, we investigate *how going global affected the governance of beef systems by evidencing the emergence of strictly coordinated sub-systems*. To identify that, we analyze three Brazilian international companies in the beef industry: JBS, Marfrig Group and Minerva Foods and their contract forms, adaptation process, incentives, and administrative control (Williamson, 1991).

The cases contribute to the literature in three ways. First, they refine the effect of internationalization on the governance structure of supply systems. For example, how companies face going to market opportunity with institutional barriers — cultural, cognitive e regulatory ones. These international requirements shape organizational strategies to coordinate themselves to meet the demands. Second, they help us to identify the problems in coordination faced by the failure in designing internal institutions in order to satisfy external demands. Third, these ideas contribute to a better understanding of SSSCs functioning (Zylbersztajn & Farina, 1999), despite a large empirical work has been carried out for the last 15 years by researchers in Brazil in several agribusiness systems.

2. Institutional Shocks and the emergence of Sub-Systems Strictly Coordinated (SSSC).

Agribusiness systems (SAG) are contractual arrangements aligned with transaction characteristics and the institutional environment. This alignment means that efficiency is obtained through contractual arrangements, minimization of production and transaction costs considering the institutional environment (Zylbersztajn & Farina, 1999). This concept is an application of a firm's coasean approach to the theory of supply systems, in search of tools to align chain studies to governance mechanisms. We understand governance as shaping the organizational and institutional relationships that will provide efficient support to the systems and will coordinate them so that contractual adaptations are implemented in specific systems when externalities to generate and share value are faced.

Once the supply system is seen as an expanded firm, the concept of Oliver Williamson (1975) of hierarchy is explored, because the firm is not considered only as a nexus of contracts, but also as

contracts defined by their specific governance modes that can vary between the market and hierarchy. In agribusiness systems, the works of Davis and Golberg (1957) and Golberg (1968) are taken as references, in which they discuss the dependent relations between input agents, production, transformation industry, distribution channels and the consumer. Golberg (1968) presents three main characteristics: (1) the focus of agricultural firm is amplified; (2) it highlights intersectoral relations and interdependent economic relations proposed by Leontieff and Market-Share Matrix; (3) his study warns about the decrease of agricultural production in importance to economy, in face of other sectors. Other authors also advanced this literature in Europe, but SAG studies differ from chains or supply systems approaches by incorporating institutional and organizational environments such as institutions and associations (Zylbersztajn, 2000). The following Figure 1 presents the concept of the SAG.

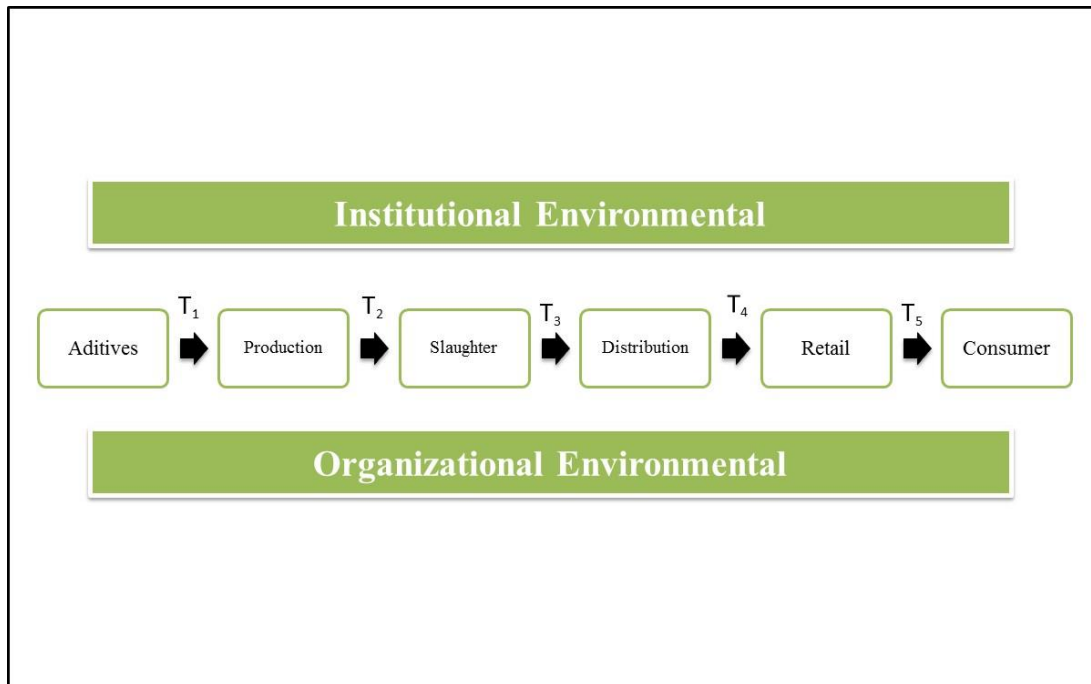


Figure 1 – Agribusiness System (SAG)

Source: Zylbersztajn (2000, p.14)

The coordination understood between the agents is the capacity of information transmitting (Zylbersztajn & Farina, 1999). Transaction characteristics (asset specificity, uncertainty, frequency) stated by Williamson (1985), needs to be known to achieve efficiency in coordination process (Zylbersztajn, 2000). The literature of SAGs consider that three main elements are present in the constitution of an SAG: (i) contracts between firms is the way hierarchies are defined and their mechanisms of control and incentives; (ii) SAG is affected by the ability of leading the internal activities between agents, and transnational transactions can be more complex due to differences between institutions; (iii) we can rarely see an SAG with a single dynamics, because different companies compete for resources and consumers.

Adaptation and strict coordination

Williamson (1996) proposes that adaptation capacity to shocks influences in governance structure, and this can be autonomous or coordinated. The institutions, organizational environments and the internal relations of the SAG change along the time, so that institutional arrangement¹ adaptation becomes necessary (Zylbersztajn & Farina, 1999). We propose that the external shocks denominated by Zylbersztajn and Farina (1999) can be discriminated in three levels of change, in relation to the adaptation process: (a) changes in the institutional environment, which can be macro analytical as a change in legislation, or micro analytical as internal rules of the company (Farina et al.,

1997). Institutional differences between countries are an example, since it affects exports process. The requirements need to be accomplished and agents coordinate themselves to adapt to them and get the value; (b) changes in the organizational environment can be considered shocks because they can modify the dimensions of the transaction, especially specific assets and demands because of its new rules. Monteiro and Zylbersztajn (2012) present the study case of transgenic soybean in different institutional environment and their impact on property rights protection; (c) the relation between agents is a factor of change, as they exchange information and construct trust relationships, new systems can emerge. Claro et al. (2005), segregate in their model applied to the flower market that the patterns are different between buyers and suppliers. The study shows that buyers are committed to joint actions that safeguard and coordinate specific investments. While suppliers are influenced by flexibility and trust. In this model, buyers present requirements or patterns of behavior in the relationship involving benefits and the expectation of a long-term relationship with "smoother" forms of work. Figure 2 resumes this conceptualization of the emergence of sub-systems strictly coordinated.

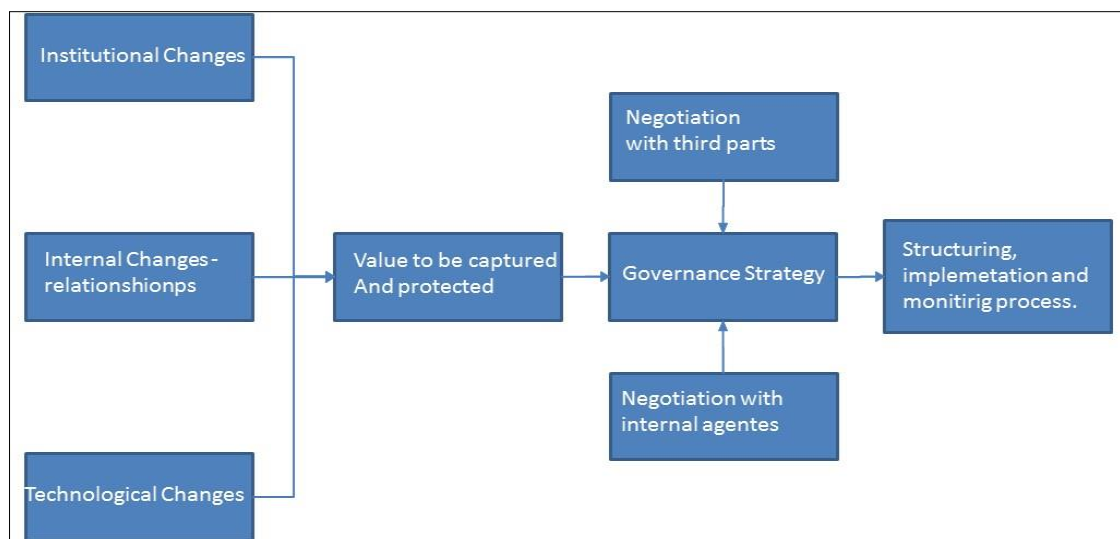


Figure 2 – SSSC process of emergence

In the SSSC emergence process, the coordinating agent, which is an internal agent of the system, has a social role in structuring the value creation and protection strategy of economic property rights through the definition of the governance structure and its coordination mechanisms.

SAG X SSSC: Limits

Which are the limits between a SSSC and a typical SAG? The Strictly Coordinated Sub-systems (SSSCs) can be seen as a nexus of linked contracts in coordinated ways through distinct mechanisms. Three aspects are highlighted by Zylbersztajn and Farina (1999) for the characterization of these SSSCs:

- Different governance structures can be observed throughout SSSCs. Thus, for efficient management, it is necessary that incentives and control mechanisms be related to transaction costs and that considerable efforts be made to “enforce” such connections.
- SSSCs are directly affected by the institutional environment that governs them – “the rules of the game”, as conceptualized by Douglas North (1990). The issue of institutional quality and its relationship with protection mechanisms established by Monteiro and Zylbersztajn (2012) model indicate the impact that the institutional environment has on the choice of governance strategies.

The concept of organizational tolerance², reinforces the importance of the institutional environment because it affects the degree of variability of the institutional arrangements observed to protect the property rights of similar transactions. In weaker institutional settings, the number of arrangement observed was greater. Zylbersztajn and Coleman (2009) exemplify cases of Brazilian agribusiness, explaining the diversity of governance structures among different agro-industrial systems

such as ethanol, orange juice and beef. It is important to note that as these coordinated contract nexuses cross a country's borders, as is the case of SSSCs that are formed to serve international markets, their complexity is aggravated by the necessary adaptations.

- SSSCs work as if they were a single company (hierarchy), whose internal agents' autonomy is preserved in at least one of the stages of the system. The ordering of transactions between the internal agents takes place from formal or informal contracts so that individual actions can be planned and implemented, in which the following are provided: (a) the characteristics of the transactions due to the specifics of assets and frequency, guaranteeing that the SSEC is able to plan for the flow of products; (b) the mechanisms of control and incentive linked to avoid ex post opportunism between the parties and ensure the implementation of SSEC.
- Internal contracts also enable the reorganization of agents in an SSEC to happen faster than the typical SAG because of the faster flow of information. As transactions are vertically coordinated between agents for a single goal, aligned with the competitive strategy adopted and the characteristics of transactions, its responsiveness to environmental changes — institutional, organizational ones — is greater than to a typical system. Thus, institutional changes established by domestic or international public policies, consumer rights, specific legislations or even changes in patterns of consumption habits in relation to a product, as well as technological changes and relations between internal agents, may require specific coordination mechanisms. These facts lead to investments in specific assets by the system's agents, so that transaction costs increase. If the institutional environment is strong, the tendency is that system agents will be able to protect their property rights through the judicial system. As the institutional environment is not able to protect these rights, private arrangements will emerge — the SSEC. However, coordination costs were only justified if the system were formed for the same purposes — clear and specific ones (Zylbersztajn & Farina, 1999).

In other words, producers, processors, distributors and retailers participate in coordinated systems to meet the demand for products that reflect different sets of attributes, whose property rights are transacted and protected through hierarchical structures. We propose that the delimitation between the SSEC and the typical SAG occurs in the presence of mechanisms of administrative control, incentives and reputational is established in formal or informal contracts that coordinate transactions that involve investments in specific assets.

3. Research Design

We analyze the three major Brazilian slaughterhouses, which were selected based on some criteria: (i) to have the transformation process as the principal activity in beef SAG; (ii) to have producer relationship management; (iii) to be certificated to export to the European Union and (iv) to have access to data and people. The research was conducted based on purchases and the relation with producers' areas to delimitate the study and make it viable (Yin, 2010).

JBS-Friboi: created in 1953 by the Batista Family, who owned a commercial place in the city of Anápolis. Just in 1957, the patriarch of the family bought the first slaughterhouse in Brasília, with the change of the capital of Brazil from Rio de Janeiro to Brasília. The business grew between the 1960 and 1980, and expanded in the 1990s in other regions of the country. In 2005, the company made their first international acquisition, Swift Armour in Argentina; since then, a succession of international acquisitions were made around the world, also including other proteins, which made JBS the major protein company in the world. This expansion is based on Batista's children's belief that, in the long run, the consumption of all kinds of proteins will grow in developing countries, and that natural resources are limited.

Marfrig Group: created in 1986, when Marcos Molina, Marfrig's founder asked his father to leave the family business (a butcher's shop) to start his own, a distributor of cattle viscera. Since he was 12 years old, he helped his father at the butcher shop, and this encouraged him to place the first operations in Mogi-Guaçu, which later expanded to Campinas and São Paulo. During the Cruzado Plan (an Economic Plan in Brazil) it became easy to import meat from Argentina, which favored the company to grow. In

1998, he placed a center of bovine meat distribution in Santo André, and the company became known for working with quality meat and noble cuts, in São Paulo, and restaurant chains. The first slaughterhouse was rented in 2000 and the movement of expansion started in Brazil, and in 2007, South America and North America and Europe. The company was the pioneer in signing a commitment with Greenpeace assuring not to buy cattle from illegal areas and deforestation, and having a global inventory of greenhouse gases.

Minerva Foods: Minerva's history starts in 1950 with the investment of Edvar de Vilela Queiroz in cattle transportation from farm to slaughterhouses called Expresso Barretos. Only in 1992 the first slaughterhouse was bought in Barretos, and Fernando, Edvar's son, became the president based on a business plan that contemplated a company turned to exports activity. The fleet of trucks from Expresso Barretos was used and constituted a distinctive feature for the company, because it permitted the supply of small and medium retail. The expansion in other Brazilian regions started in 1999 and in South America in 2008, turning the slaughtering capacity into 5,450 per day in Paraguay, Uruguay and Colombia and 11.880 per day in Brazil. Minerva is the only, out of the three companies observed, that did not have any operations with other types of protein.

Data collection

Data collection was carried out through bibliographic research in archives of books, journals, websites and contracts of 1997-2016 on the evolution of transactions in the agroindustrial system of export (cattle — industry — international market) in each of the companies presented, as well as documents of the Brazilian Association of Meat Exporting Industries (ABIEC), which show the evolution of the sector coordination. After the data collection, we conducted semi-structured interviews with company officials responsible for the areas of relations with the cattle rancher and commercial, through visits to companies and meetings. The questions for each interviewee were elaborated with the objective of searching for the history of exports to the European Union and its reflections on possible coordination for the internal market.

Tabel 1: Interviewees - Case studies with refrigeration groups

Date (dd; mm; aaaa)	Company	Time of interview (hours)
09/07/2016	Relationship with producers Director in Marfrig Group (até Maio/2016).	1:30
22/08/2016	Relationship with producers Director in Marfrig Group (a partir de Junho/2016)	1:00
08/11/2016	Manager of livestock in Marfrig Group.	1:00
01/07/2016	Origination Director in Minerva Foods.	2:00
07/07/2016	Diretor of feedlots in Minerva Foods.	1:30
19/08/2016	Relationship with producers Director in JBS – Friboi.	2:00
22/01/2016	Origination Director in JBS- Friboi.	1:00
14/10/2015	Commodities in JBS – Friboi – future contracts.	1:00

The collection protocol is in Attachment A. In addition to this strategy, as highlighted by Yin (2010), multiple forms of evidence were used to converge on the same findings. The author points out that these sources may be six: 1) documentation; 2) record on file; 3) interviews; 4) direct observations;

5) participant observations; 6) physical artifacts. In this research, the semi-structured interviews were carried out concomitantly with the observations of lectures at livestock events of the companies studied, the research of historical records (magazines, newspapers and publications of the annual reports of the companies), all characterized as secondary sources to structure the case studies. These tools and research techniques allowed the integration of multiple data sources, which converged for data analysis (Yin, 2010).

Data Analysis

We analyzed the data using the three-step case studies, following the recommendations of Yin (2010):

Understanding the evolution of coordination between the SSSC-exporter and the typical SAG through the contractual analysis, incentives and administrative controls involved. From the chronological tabulation of the data and the familiarity with its details the case studies were constructed. We inserted other secondary data sources throughout the process until they were saturated, such as reports available online, which confirmed the information first collected. This step comprises the general strategy of case description, which assists in the descriptive analytical framework for organizing the case (Yin, 2010). Table 2 shows the discriminant mechanisms of the governance structures used for SSEC-exporter analysis.

Tabel 2 – Governance Mechanisms

<i>Competences</i>	<i>Governance Structure</i>		
	<i>Market</i>	<i>Hibrid</i>	<i>Hierarchy</i>
Private Enforcement			
Incentives	++	+	0
Management control	0	+	++
Autonomy adaptation	++	+	0
Coordinated adaptation	0	+	++
Legal Enforcement			
Contractual bases	Classical	Neoclassical	Relacional

Source: Adapted from Williamson, 1996, p.105

Understanding dependency relationships between agents and contractual adaptations. Following the recommendation of Eisenhardt (1989), the intra-case analysis was performed, through which it is analyzed individually, in order to obtain familiarity with the data. Afterwards, we proceeded with the intercases analyzes, in search of similarities and differences between the cases.

Theoretical developments. The conclusions of each of the case studies, the intercase conclusions were compared to confirm the research hypothesis.

4. Beef systems design

The analysis of the three study cases helped to refine how SSSCs emerges, as it was discussed by Zylbersztajn and Farina (1999) and in our propositions. Taking the model presented by Figure 2 as a starting point, we introduce a refinement and extension of the social aspects that these companies have to coordinate their systems and how tolerant their designs are.

The analysis of the model to export to European Union was taken due to the number of requirements to the industry and producers to guarantee the standards of food safety and sanity. The cases indicated that this international demand is related to the new SSSCs observed in internal market of quality meat based on specific assets (Zylbersztajn & Farina 2005) and the hybrid governance structure.

We provide an inter and intra cases analysis based on discriminant variables of governance structure — incentives, administrative control, contracts, and type of adaptation (Williamson, 1996).

The analysis of each company transactions provides us with pictures of different structures that are articulated at the same time.

Governance structures

Minerva's transactions start from the balance of market necessity and financial returns. These are the first evidences that transactions occur in the market governance structure, in which we cannot observe pre-established contractual commitments and prices. All transactions are concreted in the spot market (internal, external and living cattle) and the contracts are not long-term. The company presents exposed incentives for the European Union transactions, which is in conjunction with the Prime Beef, 35% of the demand. The 65% represents internal and external markets that are satisfied through commodity beef. Figure 3 represents these transactions.

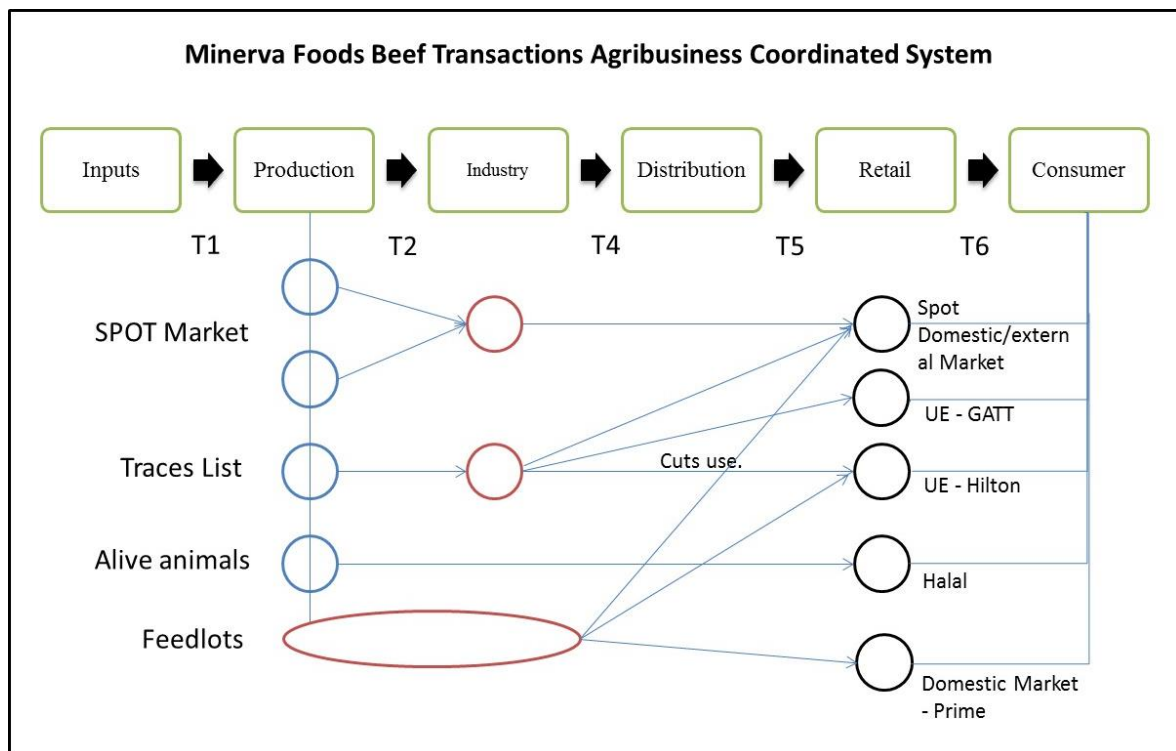


Figure 3 – SAG and SSSCs of Minerva Foods

As it can be observed, some different governance structures compose the sub-systems in Minerva SAG. Prime Beef SSSC demands the coordination with the producers and the finalization of the animals are done in internal feedlots 90% of the animals are bought in contractual bases. As the transactions destined to accomplish European Union quotas, Prime Beef has a hybrid structure and living animals a hierarchical one. The others are governed by a market structure without economic incentives declared by the company.

As much as Minerva Foods has on its DNA the process to exports to developing countries, Marfrig Group has on supply restaurants and consumers with quality beef. The emergence was based on demands of *Rubaya*, *Fogo de Chão* and *Outback*, restaurants that placed specificities, demanding coordination with production to fulfil them, like breed specifications, type of feed, biome (location), carcass characteristics, standardization and constancy in the distribution flow.

Marfrig's governance structures emerged from different groups of specific assets to be invested and monitored (frequency and uncertainty of standardization). Its operation started with own feedlots to supply European Union quotas and restaurants. On this structure, the firm performed the insemination of females and the finishing process in their own feedlot, characterizing a hierarchical structure motivated by the lack of structure in the system (production) to support the necessities through

contracts.

Exporting to the European Union represented to follow the requirements imposed from time to time⁴, demanding the industry and producers adaptations and controls, and this situation changed the relation with the producers. Examples of this process were the implementations of individual pH control, cooled vacuum products, traceability control of animals, control of the documentation of farms enabled to exports, and implementation of structure to work the animal welfare issue prior to slaughter. The incentives were fundamental to promote the investments needed in production phase. Figure 4 demonstrates Marfrig systems.

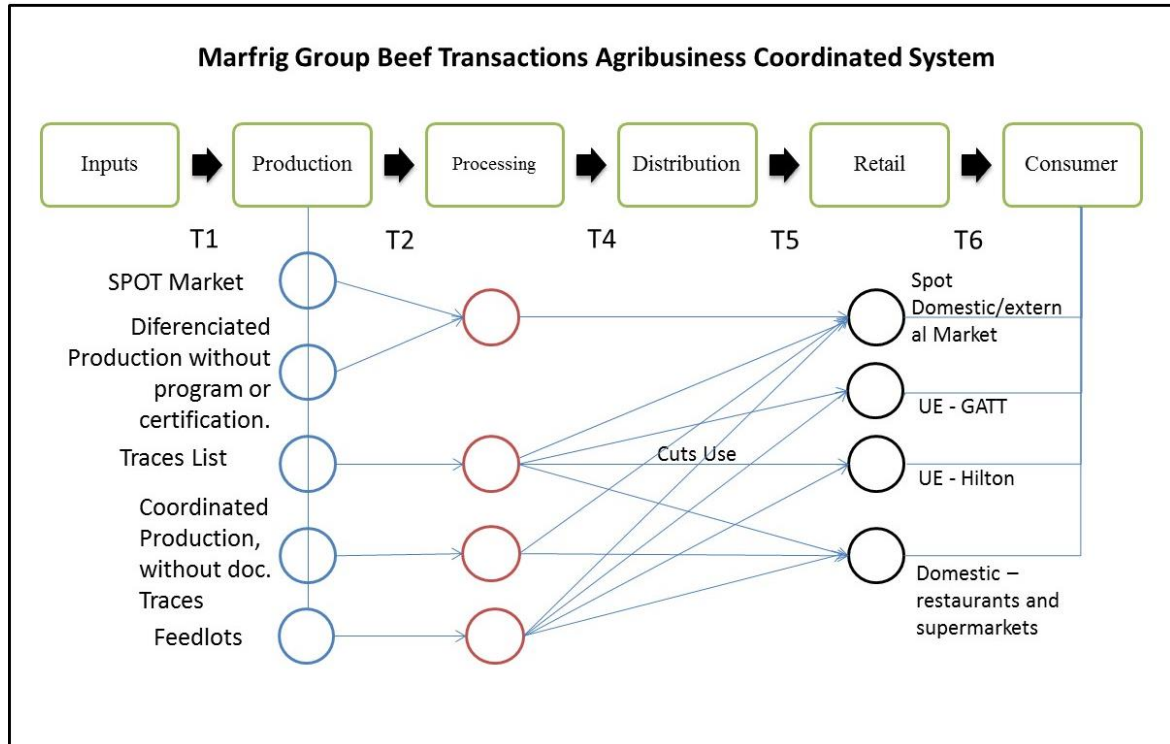


Figure 4 – SAG and SSSCs of Marfrig.

We observed that there are different SSSCs through coordinated transactions through formal or informal contracts (C), which are translated into hybrid structures, as there are specific requirements such as performance in the European Union, production coordinated by the Marfrig Club and quality programs and confinements. Transactions carried out via the market are considered autonomous (A).

The emergence of SSSCs in JBS-Friboi is derivated from organizational changes, although they were motivated by European Union transactions, as the other cases. It was by studying their internal process and the observation of non-standardization of animal characteristics that the supply problems were identified and the idea of maximization of origins and destinations of the products was put into practice.

The creation of the “Farol da Qualidade” program and the system of economic incentives, according to the requirements of the animals transacted, changed their final products and performance. With the results of the program, the company performs as an agent protagonist of change – the coordinating agent. The creation of a payment and relationship system with the producers allowed the capture of value to happen, based on the development of a relation of transparency and reputation building. Figure 5 represents the design of the SAG and SSSCs of JBS.

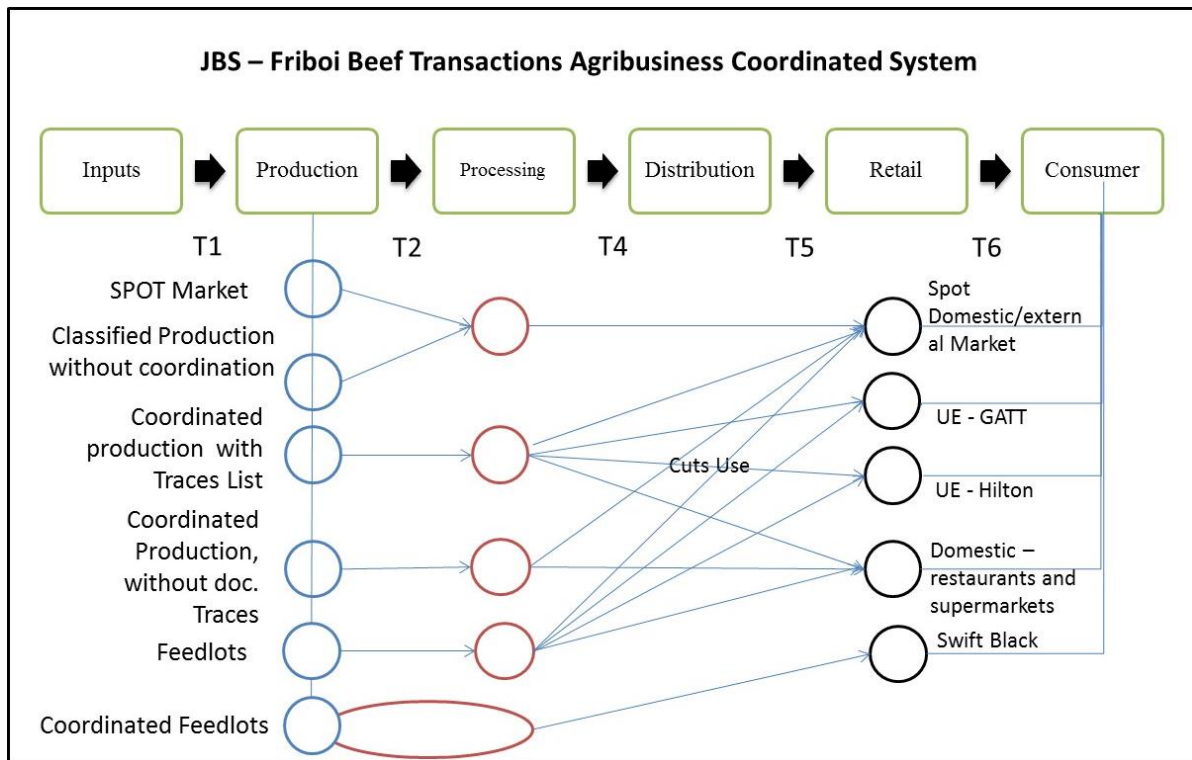


Figure 5 – SAG and SSSCs of JBS-Friboi.

It is observed that the two main structures of governance can be evidenced: market and hybrid. These structures that make up the SSECs were made possible through quality programs, quotas and their incentives for external markets and the partial internalization of the production system.

The transactions observed in Figure 5 can be divided between the coordinates by formal or informal contracts (C) and those coordinated by the market prices (A), considered autonomous. The animals are used in more than one Sub-Sag depending on the attributes they possess. This is due to the delimitation of specific cuts that each market performs.

The creation and advance of control and incentive mechanisms, aligned with technology has made it possible to reduce the costs of the governance structure of the SSSC-exporter to the EU with the accession of fixed-term contracts, which guarantee the supply of animals for the within established standards.

The Swift Black niche represents a governance structure in which the company controls the specification of animals that are purchased in the southern region of Brazil and the finishing process is carried out in the internal feedlots thus considering a hybrid structure whose coordination is stronger, since it provides financial incentives and full control of the animal supply system.

Adaptation, Incentives and administrative control

Minerva Foods, as aforementioned, does not adopt the system of financial incentives in a formal way to coordinate its sub-systems, due to the strategy of performance based mainly on spot sales with the production directed to markets that pay more. Thus, the adaptation to market shocks consists largely in the autonomous type, performed on the basis of the prices paid. Contractual informality is also observed; in 2015, the transactions between producers and the company were formalized through e-mail, since formal contracts do not exist. The information sent is the terms agreed between them when the transaction takes place: 1) price; 2) registration data; 3) form of payment. This measure was adopted with the intention of improving the transparency and safety in the relations between both parts, and reducing the uncertainties of the transactions between the parties.

Although contractual informality is predominant, contracts are observed to serve the specific niche markets - Prime and the Hilton Beef and GATT Quotas (Europe). The adaptations required to

operate in more demanding in terms of specific internal investments, both in the company and in the animal production process, which are justified only through incentives and coordinated actions between these two agents for the delivery of a product with differentiated attributes, characterizing an adaptation of type C.

Control mechanisms are based on the requirements of each country and those that are internal to operate in Brazilian regulation. Country licensing and regional capacity to reach the final destination with the type of cattle/beef needed to form a portfolio will be a key combination for the creation of a relationship with the producers and the discrimination of products by destination.

Following the positioning, we observed that the Minerva presents incentive mechanisms to improve the quality of the raw material base in order to enable a greater number of markets, besides reducing possible problems with opportunism regarding the delivery of the animals originated from farms registered in the Traces List. The incentive mechanisms in this relationship are not based on premium, but credit (Arroba mais lucrativa⁵), guarantees of price and supply (Boi a termo⁶) and convenience of outsourcing the confinement. These are programs in which the producer can participate or not in order to improve their production. Table 3 presents Minerva Foods programs and the characteristics of transactions.

Tabel 3 – characteristics of governance structure of programs and transactions between producers and Minerva Foods.

Programs	Contract	Uncertainty	Incentives	Controls
Arroba mais lucrativa	Classic	+	0	Product and financial control
Boi a Termo	Neoclassic	+	Contractual clauses	Risk minimization and supply.
Feedlots	Vertical Integration	++	0	Risk minimization and supply
Quota Europa e Hilton Beef	Neoclassic	+	R\$2-3/@ to Cota GATT + R\$2-3/@ to Cota Hilton	Documentation control and opportunism
Prime Beef	Neoclassic	+	1,5% - 3% /@	Animal specificity control

The first economic incentives were proposed based on the conference of documentation of suitable farms (Traces) and suitable animals (documentation of traceability) and not necessarily of the carcasses resulting from the production process. Brazil has 1700 farms qualifying for export to the EU. However, by 2016 quotas have never been fully met, indicating that the existing economic incentives are not enough to coordinate the producer to strictly meet the needs of the EU demand. The coordinated contracts to service restaurants and supermarkets (retail) in the domestic market, launched a second challenge for the company that was not included in the SSSC-exporter to the EU, the regularity of supply, which can be translated into time specificity. Initially this motivated Marfrig to internalize part of the production, creating confinements and performing artificial insemination.

The lack of information on food safety and the need of the dissemination of good practices in the system to obtain quality products motivated the company to create the Marfrig Club⁷ in 2010, constituting the main relationship and development strategy of the system to serve its differentiated markets. The creation of the Marfrig Club and the quality programs, translated into organizational advances and the internal relationship of the agents of the system, allowed the capture costs and system governance to be reduced, making it possible for the SSSCs to move to be served by contractual structures — hybrids, by means of controls on animal quality standards, internal processes of industry and farms; reputational, financial incentives under race development programs and documentation for participation in EU quotas or association certifications and formal and informal supply contracts. Marfrig

Club is considered an informal contract which both parts, producers and processors establish a relationship of coordination and cooperation.

Other programs for the development of breeds through artificial insemination as Angus and Hereford; Nelore Natural are part of Marfrig relational and quality strategic plans with producers to guarantee high levels of supply. All these programs are intensive in economic incentives, quality guarantee through certifications provided by associations, knowledge diffusion and loyalty. These programs induce adaptation of type C, especially the Marfrig Club and the promotion of artificial insemination. Through the process of continuous improvement, the producers and the slaughterhouse cooperate progressively in their formal and informal contracts, aiming at increasing supply frequency, reducing uncertainties, risks and opportunistic behavior between the parties.

The adaptation of type C is still observed in contracts with restaurants and supermarkets, in which the demands of final customers reflect the flow of information in the chain to adapt the raw material supply system. Time in this sense is the specific asset essential for the promotion of change. Contracts are designed in a way they are already coordinated with the supply of animals, so that there is no stimulus of contractual breakdown or judicial disputes. Table 4 resumes the programs and transactions characteristics.

Tabel 4 – Characteristics of governance structure of programs and transactions between producers and Marfrig Group.

Programs	Contract	Uncertainty	Incentives	Controls
Marfrig Club	Neoclassic – Informal contract	+	30% to Hilton Beef animals and 15% to Cota GATT – is additional to other programs	Documentation control, associations of the product and financial.
Boi a Termo	Neoclassic – formal contract	+	Contratual Clauses	Supply control and minimization of risk
Feedlots	Neoclassic – formal contract	+	0	Supply control and minimization of risk
Fomento Angus	Neoclassic – formal contract	+	0-7% do valor da arroba no Brasil central e 0-8% do valor da arroba (RS); até R\$25,00 por inseminação realizada.	Associate Control and animal characteristics.
Program Hereford	Neoclassic – formal contract	+	0-8%/@	Associate Control and animal characteristics.
Program Nelore Natural	Neoclassic – formal contract	+	0-3%/@	Associate Control and animal characteristics.

The coordination concept diffusion on JBS-Friboi was also a result from an international perspective, sustainability evolution, and the continuous search for improving the quality of animals after the 2000s, by classifying them to obtain more information about standards as an organizational process. This was the first step of supplying that alternated products dynamics from pull to push through market demands and their specificities.

In 2012, JBS created the relationship with supplier's directory to ordinate the development of the chain and aggregate value to the stockholders. We notice that autonomous adaptation that dominated the type of transactions have been transformed in coordinated ones with the implementation of their own protocols of quality and the "Farol of Qualidade"⁸.

The economic incentives for quality followed the same way of the SSSC-exporter to European

Union: i) formal protocol and the communication with the producer was unique, not case by case; ii) quality protocol pays more to good producers and penalizes the bad ones; iii) there are places where the protocols are not mandatory. The penalty for bad animals was implemented in 2016 and in the first eight months, the “red-sign animals” were reducing, and the “green ones” growing. This indicates that the information flow and type C coordination are observed.

JBS-Friboi established the protocol first in Mato Grosso do Sul State and other programs to foster bovine breeds because the producers are used to classifying the carcasses due to government incentives. We observed in this company that transactions occur in the spot market, “boi a termo”, and deals. The last one are informal agreements between the industry and associations about the supply volume that they dispose. The associates are not obliged to joining, but if they want, they just need to accomplish the “Farol da Qualidade”. Table 5 resumes the programs and characteristics of the transactions.

Tabel 5 – Characteristics of governance structure of programs and transactions between producers and JBS-Friboi.

Programs	Contract	Uncertainty	Incentives	Controls
Spot	Classic	0	0	Carcasses characteristics
Spot – Farol da Qualidade/Angus/Quotas Europa e Hilton	Classic	+	Economics as the rules of farol da qualidade	Documentation control, associative control of the product and financial earnings.
Agreements with associations	Neoclassic – informal contract	+	Economics as the rules of farol da qualidade	Quality standards
Boi a Termo – Farol da qualidade/Angus/Quotas Europa e Hilton	Neoclassic – formal contract	+	As the contract agreements	Quality standards and volume of supply.
Boi a Termo – no quality characteristics	Neoclassic – formal contract	+	As the contract agreements	Quality standards and volume of supply and prices.
Feedlots - services	Neoclassic – formal contract	+	0	Risk control and cost control.
Feedlot Swift Black	Neoclassic – formal contract (stronger)	++	Informal contract, without obligations. Economic incentives as the rules established for the Rio Grande do Sul state.	Associates control and animal specificity; minimization of supply risk.

JBS feedlots are service providers to producers in a commercial partnership; the exception of this process is Swift Black feedlots, whose animals are brought from Rio Grande do Sul to be finished internally. The transaction occurs through informal contracts; with a special economic incentives for Rio Grande do Sul producers, because the animals have specifications of breed and feed.

Intercase analysis: a zoom on reputation and organizational tolerance

The analysis of regularities between the cases showed that the necessity of creation of the SSSCs-exporters to the EU represented two important roles: i) it motivated changes in national institutions to supply the internal and external markets; ii) it encouraged the hierarchical coordinating agents to visualize new possibilities to capture value by constructing new hierarchies. Since the internal institutional environment and the trade requirements, formalized by the WTO, private rules were created to meet this demand so that its attributes became easy to measure and defend. This demonstrated that an arrangement emerged with its economic property rights protected by formal rules. This makes EU-based exporting SSSCs similar to each other, but heterogeneous to SAGs.

We observed that the constitution of SSSCs for the domestic and foreign markets occurred through the encouragement of organizations to promote technological diffusion and the desired animal patterns using incentives (benefits), quality programs or technical assistance (Arroba Mais Lucrativa, Marfrig Club and Farol da Qualidade) so that the investments in specific assets are realized (risks). However, the coordination and the SSSCs internal formation cannot be considered regular due to the presence of informal coordination mechanisms, such as the reputation among producers and companies.

We also noticed that in systems whose coordination with retail / distribution / restaurants, value protection initially took place through the hierarchy and that in view of the possibility of contracting and reducing uncertainties regarding the delivery of compliant animals, the structures migrated to reducing system governance costs. However, we also observed systems in which this action was not possible by locational specificities of animal husbandry, thus determining a hybrid governance structure with strong coordination observed in Prime Beef and Swift Black, with its incentives, control mechanisms and contractual formats.

The regularities and the consequences that the strict coordination necessary for the European Union supply demanded in each of the companies the promotion of initiatives of value capture through opportunities, mainly related to the internal market (strategizing⁹) and also to better explore the distribution channels to optimize the beef cuts among the different markets (economizing¹⁰). The programs related to the development of races presented, in all cases, the relation with the associations of race as certifiers, which indicates another variable related to the reputational aspects as to the origin and genetic quality.

Tabel 6 – Observed variables in SSSC formation through the companies programs.

	Prime	Marfrig Club	Fomento Angus	Fomento Herford	Nelore natural	Farol da qualidade	Angus beef	Swift Back
Contract type	Formal	Informal	Informal	Informal	Informal	Informal	Informal	Formal
Incentives	++	++	++	++	++	++	++	++
Relationship between parts	No determined	Long run	No determined	No determined	No determined	No determined	No determined	Long run
Associations	0	0	+	+	+	0	+	+
Controls	++	++	++	++	++	++	++	++
Technological intensity	++	Develop. ++	++	++	++	Develop. ++	++	++
Specific investments	++	++	++	++	++	++	++	++

Although several programs have not presented the obligation to adopt the formal contract, “Boi a termo” is a tool adopted by all the companies as a way of reducing risks to producers and guarantees of supply to the slaughterhouses. Among the cases, it should be noted that Minerva does not have a quality promotion program based on control mechanisms, financial incentives and contracts. Their purchase relationships are made based on reputational aspects not disclosed by the company. In

the case of the company, there is no explicit coordination, except for the demands of the EU and Prime Beef. But their strategies and governance structures are aligned with the positioning, as can be seen in the cases of the Marfrig Group and JBS-Friboi. This indicates that companies focused on niche services have more SSSCs, as is the case observed by Marfrig in relation to Minerva that operates in market transactions. The case of JBS-Friboi market mix and their positioning in several segments is consistent with its various governance structures and the search for maximization through standardization of carcasses.

We observed that SSSCs are identified more in systems focused on niches, such as the case of Minerva, the degree of proximity between the industry and the producer regarding the internal controls of farms is greater. The framework of multiple governance structures in the firms studied represents that the legal system protects economic property rights at a limited level, and that informal and private mechanisms must be used to protect property rights. Thus, this analysis shows that the SAG of beef cattle presents a high organizational tolerance due to its innumerable arrangements whose transactions take place via the market, the hybrid contracts with different levels of coordination and hierarchy examples.

5. Conclusion, theoretical and management implications

We analyzed the governance strategies of the three largest Brazilian beef processing companies in Brazil and in the world regarding their actions through openness to exports to the European Union (value capture opportunity) and the consequences of this process. Falling barriers, the start of exports and the trade requirements to transact with the EU are common paradigm-breaking factors in the coordination of the agro-industrial system of beef. The three cases show how the establishment of this SSSCs-exporter to the EU encouraged these industries to take on the role of hierarchical coordinating agents in this case and to seek new opportunities to capture value.

The case studies also point out that the mechanisms for determining governance structures are applicable to define and delimit the constitution of a SSSC with reputation verification mechanisms, which determine the separation of transactions materialized by market structures, even if negotiated without a formal contract. Multiple SSSCs observed with their private mechanisms to protect property rights indicate the high organizational tolerance of bovine SAG.

We concluded that the company strategy also influences coordination of the system. In companies focused on serving market niches, their SSSCs present internal coordination strategies that allow their structures to approach hierarchies due to the influence of internal controls throughout the system, and contracts with strong coordination are observed. While in companies whose prices are oriented, autonomous relations predominate, so transactions of the generic SAG and its SSECs are in smaller numbers.

In the present study, the institutional arrangement is composed of the institutional environment, the SAG, the organizational environment and the SSSC, its constraints and strategies: (a) institutional changes releasing attributes in the public domain; (b) organizational changes such as new technologies, new class representation entities, shape-shifting of class entities by throwing attributes into the public domain or capture and measurement of attributes; (c) behavioral changes among SAG internal agents involving long-term relationship building based on reputation building enabling ownership rights to be captured and shared; (d) the need for new governance strategies for the strict coordination of the system through opportunities (the coordinating agent's perception of articulating a differentiated strategy); (e) different institutions that maintain the governance structure of the SSEC; (f) support from entities involved in negotiations and warranty certifications.

From the coordination point of view, the strategies for reducing transaction costs and achieving efficiency in SAGs and SSSCs emerge through the characteristics of the transactions (g) responding to the demands of the institutional and organizational environment; (h) the coordinating agent organizes a system that differs from the SAG to meet specific demands, with a focus on balancing the distribution of

property rights between internal agents and the third one to capture value; (i), the governance strategy responds to specific institutions and the demand for certifications and technologies for its development.

This paper contributed to confirm that the use of the theory of property rights is little explored to the concept of SAG and SSSC. This finding encourages thinking of a closer approximation of the ECT micro-analytical theories and property rights to address systemic strategic issues. Possibly, the justification of this theoretical gap is due to the complexity of the theme. However, ignoring the fact of the existence of values to be captured from differentiated niches seems inconsistent with the "real world" of organizations.

Although the SSSCs-domestic market are recent, the innovative character of this research was precisely to propose the existence of an agent that acts as a hierarchical coordinator so that the SSSC emerges through the reality of the SAG, with the proposition of an efficient governance structure itself, advancing on the coordination analysis. Moving beyond the traditional discriminant analysis, a SSSC is presented through a typology, which presents a set of variables and guidelines for a future research agenda, exploring each of the dimensions of value capture and internal coordination of the System for your protection. In addition, it advances in dimensioning the impacts of the SSSC-exporter on SSSCs that have emerged in the domestic market.

As a synthesis of the suggestions that results from the analysis of the cases, the following stand out: (i) the reassessment of public policies to promote ICMS credit (conducted by Mato Grosso do Sul); (ii) the approximation of domestic regulation with international consumption trends to strengthen the reputation of the Brazilian product — Brazil and in the world; (iii) the review of the strategy of technological diffusion of public research companies so that they arrive with greater agility to producers; (iv) the expansion of credit programs for producers that associate sustainability, pasture recovery, crop-livestock and forest integration; a national discussion to approximate practices and organizational models used by countries such as Uruguay to ensure the quality of the product throughout its system.

Among some suggestions of private strategies are: (i) strengthening of collective actions and participation of entities as certifiers of SSSCs; (ii) increase in the use of private mechanisms that configure strictly coordinated transaction security, as in the term steer; (iii) creation of Brazilian brands for niches in international markets that demand strict coordination.

It is important to point out that, although this research is based on the SSSC-exporter to the European Union and since the constitution of this system in the long term has impacted Brazilian SAGs on the "emergence and capture" of value in the domestic market, Brazil is an exporter of commodities. By emphasizing this fact and the importance of the creation of Brazilian brands and the potential to be explored in terms of internal coordination, new dimensions come to exist of transnational (cultural) institutional orders, market structure that were not addressed in this research.

These absences raise questions about the supply of international niche markets by Brazilian companies, but using SAGs or SSSCs from other countries that have subsidiaries. Are the lowest transaction costs and the best structures being compared? The Brazilian system in presenting recent internal SSSCs based on private rules, what is the level of organizational tolerance of these arrangements? Could they be developed to compete globally? Thus, the challenge is set forth: the construction of a theory for the internationalization of Brazilian SAGs and SSSCs that allows analyzing the discommoditization phenomenon from more efficient strategies and governance structures in order to capture value.

Notes

1. **Institutional arrangements:** the first definition of institutional arrangement was made by Davis and North (1971) as the set of rules that governs the way in which economic agents can cooperate and / or compete. Oliver Williamson employs the term governance structure meaning "the institutional matrix within which transactions are negotiated and executed" (Williamson, 1985, p. 105).
2. **Organizational Tolerance:** the variety of institutional arrangements observed for similar transactions (Zylbersztajn & Coleman, 2009). The authors propose that the greater the proportion of rights protected by formal institutions, the smaller the variability of institutional arrangements in a

hybrid form.

3. **European Union Quotas:** Established quota that consists only of special cuts of beef referring to the hindquarters of precocious steers. Its price on the international market is higher than the others due to its high quality requirements (identification from birth, extensive farms and classification of fat finishing conformation). Its annual quota is 65,250 tons and is fixed, with limited access by some countries that are accredited: Argentina, Australia, Brazil, Uruguay, New Zealand, United States, Canada and Paraguay. The Brazilian quota is 10 thousand tons per year distributed among the exporting refrigerators. The GATT quota is made up of special beef cuts referring to the hindquarters of precocious steers, also at differentiated prices. Its differentiation of the quota Hilton is given by the specificities of production. The quota GATT is 150 thousand tons of meat in natura, and has an import value of 20% add valoren. This quota is distributed among importers in the European Union and such costs are passed on to consumers. The full lev meat can enter the EU with 12% of taxes and three euros per kilo exported (ABIEC, 2015)

4. See Lemos and Zylbersztajn (2014).

5. **Arroba mais Lucrativa (Arroba more profitable):** the objective is to foster the development in farms and, at the same time, to retain the producers by giving subsidies of technical and financial knowledge so that their product improves in quality. The characteristics of the program are: the advance of financial resources to producer in order to purchase animal food, supplements, technical guidelines directed to obtain the animal that Minerva needs. The program does not provide for any type of contract of supply of animals, or incremental financial incentives.

6. **Boi a termo:** It is a controlled tool in the Stock market operated by the company in two contractual modalities: the establishment of a minimum price or value of cattle arroba through indicator (as the value of the arroba provided by CEPEA – Brazilian index) and use of market indicators. The advantage of using this tool to transact is the determination of contract price and volume "locks" that allow the stockholder to act as a risk manager, especially when working with feedlots - which require the supply of inputs, balancing their costs and recipe; and industry can guarantee the level of supply from its organization of its scale in the long term.

7. **Marfrig Club:** Program of relationship with the farmer based on the principles of respect for the animal, environment and social. The objective is to bring information on topics related to livestock production to the field and the production of safe, legal and sustainable meat so that cattle ranchers seek to innovate in their internal production and management systems in order to form a select group of suppliers. The program consists of classifying properties between beginner, bronze, silver, gold and platinum according to animal welfare, traceability, nutrition and sanity (animal respect); Labor standards, habilitation, education and incentives (social respect) and vegetation, soil, waste and water (environmental respect). Each category presents a set of relational and financial benefits (joint adhesion with other development programs presented later) in order to encourage ranchers to seek the development of their properties with the technical support provided by the company.

8. **Farol da Qualidade:** The program was built based on demand information and internal controls resulting in the ideal types of animals the company needs to serve in its diverse markets. The reward system (financial incentives) was the result of three factors: 1) learning obtained by the producer response to the incentives verified in the case of exports (farms belonging to List Traces); 2) differentiated payment for better quality animals as production stimulus and fidelity; 3) penalization of animals that are not in a minimum standard to induce improvement of the system.

9. **Strategizing:** when transaction costs are positive, exploring market power is a way to obtain competitive advantage (Williamson, 1991).

Economizing: Efficiency as a basic principle of strategy. As stated by Williamson (1991) they are the earnings from eliminate the dissipation of value.

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ANNEX A – Data collection protocol

<p>Objective: analyze the relationship between slaughtering and beef processing industries and the formation of Sub-Systems Strictly Coordinated (SSSC).</p> <p>Part A - Characterization of the Organization</p> <p>Name of organization; Founded in; Main area of activity of the organization; Current organizational structure - countries and establishment.</p>
<p>Part B - Characterization of the interviewees</p> <p>Name; Function exercised; Duration of interview, date of interview</p>
<p>Part C - Characterization of the export process</p> <p>1) Please, can you summarize the main steps of the company to export its production?</p> <p>2) How were the relations with the market and cattle ranchers?</p> <p>3) Are the confinements of the refrigerator / s to serve a specific market?</p> <p>4) How does the dismemberment of a transaction to serve the various markets work? Can they all serve different markets?</p> <p>5) What restrictions on buying animals to serve the markets? Is there an impact on the production process?</p> <p>6) Or only the European Union that presents the restrictions?</p>
<p>Part D - Incentives and the Market</p> <p>1) Please discuss the evolution of this process (export) to the current scenario of programs and protocols.</p> <p>2) What was the purpose of your creation / membership? Do they only apply to the export market?</p> <p>3) Have the programs been designed based on some standard (internal or external)?</p> <p>4) What were the challenges faced? What are the benefits?</p> <p>5) How do relations in the system change over time? Do these programs or protocols have any relation?</p>