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Contractual arrangements in the cattle beef chain: an analysis of trust

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ABSTRACT: In Brazil, the conflict between cattlemen and the slaughterhouse industry is evident and historic in the beef cattle Agribusiness System, in which opportunistic behavior is commonplace. Accordingly, the role of trust is significant in trade decisions, which makes the analysis of trust in the construction process of governance structure an important factor. The present article aimed to identify the influence of trust in selecting the contractual arrangement in transactions between cattle ranchers and abattoirs. This qualitative and descriptive study used semi-structured interviews, done in loco, along with 30 beef cattle ranchers and five abattoirs in the west of São Paulo State. It was observed that transactions involve opportunistic behavior, and that trust is critical in selecting the contractual arrangement.

Key words: opportunism, governance structure, beef cattle, trust.

Arranjos contratuais na cadeia da carne bovina: uma análise da confiança

RESUMO: O conflito entre pecuarista e indústria frigorifica é evidente e histórico no Sistema Agroindustrial da carne bovina no Brasil, sendo comum a presença de comportamento oportunista. Nesse sentido, o papel da confiança se apresenta como significativo na decisão de troca, o que torna a análise da confiança no processo de construção da estrutura de governança um fator importante. O presente artigo teve como objetivo identificar a influência da confiança na escolha do arranjo contratual nas transações entre pecuaristas e frigoríficos. O estudo qualitativo e descritivo empregou entrevistas semi-estruturadas, realizadas in loco, junto a 30 pecuaristas de gado de corte e cinco frigoríficos localizados no Oeste Paulista. Observou-se que as transações envolvem comportamento oportunista, e que a confiança exerce fator significativo na escolha pelo arranjo contratual.

Palavras-chave: oportunismo, estrutura de governança, pecuária de corte, confiança.

INTRODUCTION

The beef cattle industry plays a significant role in the Brazilian agribusiness. Brazil holds the second biggest cattle herd in the world, and it specializes in cattle meat production and export (USDA, 2017). Although, it is relevant in domestic and global contexts, empirical evidence highlights competition problems in the Brazilian beef cattle Agribusiness System, specially associated with coordination flaws (FERREIRA & PADULA, 2002; CALEMAN & ZYLBERSTAJN, 2012). Furthermore, the coordination difficulties of the bovine Agribusiness System are amplified by the conflicting environment in which the transactions occur. Conflicts between farmers and the slaughterhouse industry are evident

and historic (PASCOAL et al., 2011). Farmer's reports cite many causes for the distrust of abattoirs, such as bankruptcy with consequent payment defaults, the absence of transparency over the products' attributes and appropriation of value (PASCOAL et al., 2011).

In this segment, the role of trust between agents is highlighted (MACEDO, 2015), which may be considered relevant in the choice of governance structure (MARTINHO, 2010). Trust is seen as an important mechanism which can mitigate uncertainties and opportunistic behavior (DEAKIN & MICHIE, 1997; BROMILEY & HARRIS, 2006; LAZZARINI et al., 2008); consequently, is it held as a tool to reduce the cost of transaction (WILLIAMSON, 1993). Even though the influence of trust in economic relations is generally acknowledged, conceptual and

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empirical divergences can be found in the current literature. This occurs because the literature on trust is multidisciplinary, which can be observed in a variety of concepts depending on the approach used.

The present paper uses concepts of trust associated with the New Institutional Economy (NIE) and New Economic Sociology (NES), in an attempt to integrate both theories. From the perspective of the NIE, more specifically on one of its aspects known as the Economy of Transaction Costs (ETC), the organization is more than a production function (COASE, 1937), with the relevant transactions costs to be considered in the analysis of the firm (WILLIAMSON, 2000). Conversely, under the NES, the structure of governance is determined by the institutional environment in which the agents are inserted, being strongly influenced by the structure of social relations (GRANOVETTER, 1985, 1992). The role of trust is highlighted in both theories. For both, trust between agents in economic relations can result in profits and is important in the configuration of governance structure.

Although, many studies (GRANOVETTER, 1985; WILLIAMSON, 1993; GULLATI, 1995; NOOTEBOOM et al., 1997; BROMILEY & HARRIS, 2006; MARTINO, 2010) have designated trust as significant in the configuration of governance structure, these studies are limited in focusing the analysis on structures, and not on the development of existing contractual arrangements within the same governance structure. The transactions between cattlemen and abattoirs are ruled by many governance structures, including the spot market, specification contracts, vertical integration, or their combination (CARRER et al., 2013).

Although, there may be a significant amount of transaction modes, the spot market is still the most prevalent between cattlemen and abattoirs (SHANOYAN, BÁNKUTI & COLARES-SANTOS, 2019). In the spot market, two forms of transactions are predominant among contractual arrangements ("live" and "dead weight"), both involving different dimensions and occurring in an environment in which opportunistic behavior is present (PASCOAL et al., 2011). In this chain, it is uncertain how trust influences the choice between the "live" or "dead weight" contractual arrangements.

Thus, given the importance of trust, this paper aimed to analyze the influence of trust on selecting a contractual arrangement in transactions between cattlemen and abattoirs. Therefore, a qualitative study of descriptive character was conducted. The data were analyzed with a content

analysis technique. Results showed that trust is decisive in cattlemen's choice between the "live" or "dead weight" contractual arrangements.

This article is organized as follows. Besides this introductory section, section two presents the study's methodological procedures. Section three presents its results and discussions, based on the empirical study and theorical knowledge of the NIE and NES. Lastly, section four presents the final considerations.

MATERIALS AND METHODS

The present research has a qualitative nature, and descriptive character. First and foremost, an explanatory research was conducted, through a literature review and the collection of secondary data from official agencies. The literature review used the following parameters: (i) information collection on the beef cattle sector and, (ii) a bibliographic review, within the theoretical framework of the New Institutional Economy and the New Economic Sociology, in which themes on the Economy of Transaction Costs and interorganizational Trust were listed. The empirical study included 30 cattlemen and 5 bovine abattoirs in the west of São Paulo State.

Livestock farmers were asked about the number of abattoirs they trade with; the number of years they have been negotiating with these abattoirs; form of agreements (for example, verbal agreement or formal contract); preferences between live or dead weight; investments in improving the quality of beef cattle; carcass yield; slaughter monitoring; cases of breach of contract and perception of opportunistic behavior; asymmetry of information sources; approaches to conflict resolution and; finally, level of confidence in the abattoir regarding honesty and the perception of value appropriation in the slaughter process. The confidence variable was measured on a Likert scale from 0 to 10. The interviews were recorded and later transcribed.

The data were collected through face-to-face interviews with the cattlemen and abattoir managers from September of 2015 to January of 2016. Interviews were guided by a semi-structured script, including a series of closed and open questions. Content analysis technique was used on the data (BARDIN, 1979). The analysis categories were supported by the theoretical framework of Economy of Transaction Costs and Interorganizational Trust and were divided into three categories: governance structure, contractual arrangement and trust. Speech

analysis of the interviewees and the texts' core meanings were followed by three steps: pre-analysis, material analysis and results treatment.

In table 1, the methodological procedures used in the research are presented, aiming to present each step toward the proposed objective of the study, in syntactic form.

In the next section, the theoretical basis that guided the proposed objective of this research will be presented.

RESULTS AND DISCUSSION

The agents (cattlemen and slaughterhouses) are located in the West of the São Paulo State. Most cattlemen reported having more than 100 hectares of land and more than 400 heads of beef cattle. The beef cattle industry is cited as 28 cattlemen's most important activity, which represents more than 50% of the agricultural revenue, with 19 farmers declaring beef cattle as their sole source of income. All the sampled cattlemen had the option of transitioning from a large scope of abattoirs or cattle buyers, 17 of them reported supplying beef cattle to more than one

abattoir. Table 2 illustrates the descriptive statistics of the sampled cattlemen.

The five sampled slaughterhouses are licensed to export cattle meat. The abattoirs' statistical description can be observed in table 3.

The average distance from the farms to the abattoirs is 53,3 kilometers. Most farmers produce Nellore cattle breed and adopt a combination of extensive feeding and feedlots in the pre-slaughter period.

Transactions between cattlemen and abattoirs may be ruled by many arrangements, including the spot market, specification contracts, vertical integration, and/or their combination (CARRER et al., 2013; OLIVEIRA-JÚNIOR et al., 2020). However, among the analyzed sampled agents, the transaction occurred predominately within the spot market's structure, and all 30 cattlemen claimed that the transaction occurred predominately through verbal agreement, without any written specification. Furthermore, ratifying the findings of PASCOAL et al. (2011), two forms of transactions, "live" and "dead weight," can be observed even in the spot market, among several distinct contractual arrangements. Both involve different dimensions

Table 1 - Methodological procedures used in the research.

Step	Step Description	Details			
1	Review of Literature and bibliographic research	Theoretical Framework New Institutional Economy	Authors (COASE, 1937; KLEIN et al, 1978; WILLIAMSON, 1985; NORTH, 1991; WILLIAMSON, 2000).		
		Economy of Costs of Transaction	(WILLIAMSON, 1985; WILLIAMSON, 1989; ZYLBERSTAJN, 1995; WILLIAMSON, 1996; WILLIAMSON, 2000; ZYLBERSTAJN, 2011).		
		Economic Trust	(WILLIAMSON, 1993a; WILLIAMSON, 1993b; BROMILEY HARRIS, 2006; MARTINO, 2010)		
		Social Trust	(GRANOVETTER, 1985; GULATI, 1995; ARRIGHETTI et 1997; DEAKIN & MICHIE, 1997; UZZI, 1997; POPPO & ZENGER, 2002; MÉNARD, 2004)		
	Interviews	Interviewed	Interview Procedures		
		30 cattlemen	i) Interview guideline pre-defined;		
2		5 Abattoirs	ii) Face-to-face interview iii) Authorized interview recording of participants; record of observation in notebook; iv) Full transcription of recordings.		
	Content Analysis	Base Author	Category of Analysis		
			i) Cattlemen and slaughterhouses characteristics;		
3		Bardin (2011)	ii) Governance Structure;		
-			iii) Social and economic trust;		
			iv) Attributes of the economy of costs of transaction;		

Source: designed by authors.

Table 2 - Statistic description of cattlemen.

	Average	Minimum	Maximum
Size of propriety (hectares)	644,68	31	3.000
Area destined to production of beef cattle	624,35	16	3.000
Number of animals	1.190,86	50	10.000
Period of activity (years)	31,90	3	55
% of importance of beef cattle in agricultural revenue	91,25	20	100

and occur in an environment in which opportunistic behavior is present.

The "live weight" arrangement involves negotiation, during which the traded attributes, excluding weight, are evaluated visually. Thus, the negotiation is based on previously observed characteristics, such as weight, breed, sex and age of the animal; although, the carcass yield is not observable in advance (SHANOYAN, BÁNKUTI & COLARES-SANTOS, 2019).

Thus, the negotiation over the amount paid to the rancher is based on an expectation of the carcass yield, which cannot be measured without cost before slaughter (SHANOYAN, BÁNKUTI & COLARES-SANTOS, 2019). In this type of arrangement, information flaws are evident, as it is unknown whether the carcass will yield what is expected. Also, other aspects are impossible to ascertain previously, such as animal health conditions (e.g. abscess, tuberculosis, pneumonia, cysticercus bovis, bruising), fat finish, marbling degree, and standardization (SHANOYAN, BÁNKUTI & COLARES-SANTOS, 2019). According to interviews, in the case of carcass condemnation for animal health problems, the abattoir suffers the loss in the arrangement of "live weight", while in the

"dead weight" arrangement, the cattle farmer will suffer the loss.

In the "live weight" arrangement, the information flaws associated with the imbalance of bargaining power generate uncertainties, inefficiencies, and friction in transactions (MACHADO FILHO & ZYLBERSZTAJN, 1999; PASCOAL et al., 2011). These uncertainties and inefficiencies can lead to adverse incentives at the producer level. Friction resulting from abattoirs' preestablished generalizations discourages investment in quality, as ranchers who sell higher-quality animals are unappreciated (PASCOAL et al., 2011).

Such uncertainties could be mitigated by the "dead weight" arrangement, which involves payment negotiations between livestock producers and processors based on the live animals' characteristics (age, sex, breed) and the actual carcass yield, which allows award payments for the evaluation of the quality of the carcass or eventual discounts (MONDELLI & ZYLBERSZTAJN, 2008; PASCOAL et al., 2011). However; although, the "dead weight" arrangement proves to be more suitable to evaluate the traded attributes than the "live weight" arrangement, ranchers report being suspicious of any discounts offered by processors

Table 3 - Statistic description of abattoirs.

	Average	Minimum	Maximum
Slaughter capacity (heads/day)	770	550	1.000
Slaughter (heads/day)	722	550	1.000
Number of employees	830	450	1.500
Amount of beef cattle suppliers (cattlemen)	1.738	150	5.000
Period of activity (years)	26,8	14	35

Source: signed by authors.

(PASCOAL et al., 2011), preferring to resort to the "live weight" arrangement.

Some cattlemen report having exclusively invested in handling techniques and genetic improvements, which result in greater and faster weight gain. In this sense, the investment aimed to raise the flow and not the increment of quality attributes. Furthermore, the cattlemen who chose the "live weight" arrangement cited distrust toward the abattoirs

This distrust is caused by negative "dead weight" sales experiences, including unexplained carcass yields, severe "cleaning" processes and discounts considered inadequate, as well as by the abattoirs' reputation within the network in which the agents are inserted.

The cattlemen reported some level of trust in the abattoir that opted for the "dead weight" arrangement, which involved payment negotiations among beef cattle farmers and the processing industry based on the livestock's characteristics (age, sex and breed) and the actual carcass yield, which allowed bonuses or occasional discounts according to the quality of the carcass (MONDELLI & ZYLBERSZTAJN, 2008; PASCOAL et al., 2011). This kind of contractual arrangement has shown efficiency in compensating financially for the traded quality attributes, once the uncertainty is, in part, reduced by the post-slaughter evaluation.

In this sense, the trust factor has been shown to matter in cattlemen's selection of the contractual arrangement. The majority (eighteen) of the sampled cattlemen reported distrust toward the abattoirs, choosing to trade in "live weight." Six cattlemen claimed to trade under the "dead weight" arrangement, citing two reasons: first, having a high level of trust toward the abattoirs; second, because they claim to offer a superior-quality animal, allowing them to receive bonuses that are not payable in the case of "live weight."

Six cattlemen reported the sales in these two arrangements. These cattlemen claimed to have an intermediate level of trust. Aside from trust, the selection of the contractual arrangement is based on the evaluation of the traded animal and period of the year (when there is lack or high beef cattle demand). According to some cattlemen, when there is a bigger beef cattle offer, the abattoirs tend to perform a more thorough "cleaning" process and the carcass yield tends to be smaller. However, when there is less beef cattle offer on the market, the abattoirs tend to be more benevolent in the "cleaning" process and, curiously, the carcass yield tends to be higher.

CONCLUSION

Considering the beef cattle transactions between cattle ranchers and abattoirs, it was concluded that trust is critical in selecting the contractual arrangement. Transactions in which the presence of trust is observed between agents tend to be carried out under the "dead weight" arrangement, which allows for a better measurement of the negotiated attributes, and safer remuneration, ensuring greater transparency in the transaction. Transactions lacking trust between agents occur in live weight. It was observed that low-quality animals tend to be traded under this arrangement.

It was also observed that the buildup of trust consists in economic and social mechanisms. The economic mechanisms associated with the transaction attributes, such as specificities of assets, uncertainty and frequency, as well as behavioral assumption of the opportunistic behavior influence the perception of potential profits and losses; and consequently, the selection of the most adequate contractual arrangement, given the level of perceived risk. The social mechanisms emerge from the social interaction and influence individual perception and reciprocal expectations.

This research offers an important contribution to the decision-making process of the agents inserted in the beef cattle chain, enabling an understanding of how trust influences the selection of contractual arrangements between cattlemen and abattoirs.

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BIOETHICS AND BIOSECURITY COMMITTEE APPROVAL

We, the authors of the article entitled "Contractual arrangements in the cattle beef chain: an analysis of trust" declare, for all purposes, the project which has given rise to the present data, it has not been submitted for evaluation to the Ethics Committee of University State of Maringá, but we are aware about the contents of 466 Resolution, from December 12, 2012, of the Brazilian National Health Council http://conselho.saude.gov.br/resolucoes/2012/Reso466.pdf if it involves human beings. Therefore, we assume full responsibility for the presented data, which are available for possible questions and should be required by the competent authorities.

DECLARATION OF CONFLICT OF INTERESTS

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

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AUTHORS' CONTRIBUTIONS

The authors contributed equally to the manuscript.

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