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Transaction costs in cassava production chain: the case of Araguaia Valley Region (Goiás state, Brazil)

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1. Introduction

The cultivation of cassava is present in considerable part of the Brazilian familiar rural properties. It is an important and well-known source of obtaining carbohydrates, especially for low-income families (FAO, 2017). Whether as a "backyard crop", exploited exclusively for domestic consumption or as a commercial activity, cassava cultivation is widespread in all regions of Brazil and Latin America, as well as Africa (the largest producer in the world) and Southeast Asia (FAO, 2017). Although farming is quite common in family agriculture, there is still great difficulty in obtaining statistical data on cassava cultivation, production and processing. This is due to informality and asymmetry of information that is present in the links of the productive chain. Therefore, official statistical data only respond to the share of producers who use legalized distribution mechanisms (FRANÇA et al., 2009).

The present study is justified by the importance of the cassava as a source of subsistence and income supplementation for most of the families living in Brazilian rural areas, specially to those living in the Vale do Araguaia region in the Goiás state. The theoretical approach is the Economy of the Costs of Transaction, since the understanding of the structure and nature of the transaction costs involved in the production system in question is fundamentally important for improving the efficiency and overall competitiveness of the production chain. Also it is important to constantly understand and improve existing governance structures, always with a view to the prosperity of the productive chain over time.

This aspect, the general aim of this research is to study the cassava production chain in the Vale do Araguaia region from the perspective of the Transaction Costs Economy. Specific objectives include: a) describing the structure and nature of incidental transaction costs; b) identify existing governance structures; and c) analyze the attributes of the transactions and the specificity of the assets.

The basic hypothesis is that the prominent presence of informality in the production chain surveyed leads to the predominance of market governance in the transactions carried out, which contributes to higher transaction costs. Secondary hypotheses include: a) informality leads to the valorization of the attributes of frequency; b) mechanisms for reducing transaction costs are largely linked to market knowledge and experience; and c) the uncertainty of the producers is mainly related to climatic factors and lack of information.

2. Economics of Transaction Costs

The Transaction Cost Economics (TCE) is a branch of the New Institutional Economics (NIE) that deals with the analysis of costs arising from exchange activities carried out, internally and intra-organization. TCE studies how partners in a transaction protect themselves against the risks associated with exchange ratios. Thus, the smaller the perceived risks the smaller the transaction costs. Thus, TCE indicates that institutions should seek efficient governance structures to govern their transactions, thus achieving the lowest costs (SHELANSKI; KLEIN, 1995). In this respect the central analysis unit of TCE is the transaction, that is, the transformation of a given product through technologically separable interfaces (WILLIAMSON; 1985).

The different characteristics of different types of transactions define the costs inherent to each transaction. This cost is called transaction cost and it is associated with the search and collection of information, negotiation, elaboration and enforcement of contracts, as well as property rights and, finally, costs resulting from bad adaptations (COASE, 1937). Transaction costs are also defined by as the ex-ante costs of preparing, negotiating and safeguarding an agreement, as well as the ex-post costs of adjustments and adaptations when performance of a contract is affected by failures, errors, omissions, and unexpected changes (WILLIAMSON, 1979).

Therefore, such costs require specific governance structures that can make transactional processes more efficient and secure for both parties involved. Governance structures are the institutional matrix in which a transaction is defined and they are ideally established. This structures are applied according to: 1) the characteristics and attributes of the transactions (frequency, uncertainty and specificity of assets), 2) the behavioral assumptions (limited rationality and opportunism of agents, and 3) the institutional environment and the formal and informal institutions (rules of the game) (WILLIAMSON, 1985).

3. Methodology

This research is characterized as a descriptive case study. We sought to investigate the transaction costs and governance structures present in the cassava production chain in the Araguaia Valley Region, Goiás state, Brazil. The study area covers a territory of 18,451 km2 and has a population of approximately 72 thousand inhabitants, of which 26% live in the rural area (IBGE, 2015). We collected data from a semi-structured interviews based on two distinct scripts. The first was applied to 73 family farmers, according to the requirements of Law 11.326/2006, and the second was applied to other components of the cassava production chain such as: distributors (01 interview), processing industry (13 interviews) and retailers (14 interviews). All interviews were recorded in order to ensure the safety of the parties involved and the possibility to revise the information if necessary. The sampling procedure is not probabilistic for convenience. The producers were approached in places where they usually are (free markets and rural unions). The producers indicated the other components of the chain to be interviewed. Data were organized and tabulated in spreadsheets to enable qualitative and frequency analysis. Finally, based on Batalha and Silva (2007), we applied the systemic and meso-analytical production chain analysis (or filière analysis) methodology.

4. Results and Discussion

We identified that 82.2% of the farmers stated that they carry out all their commercial transactions without the existence of any type of contract or formal agreement. Only 17.8% of those interviewed tend to transact through formal mechanisms. In the industry segment, the situation is not very different, since 92.3% of respondents do not trade via formal mechanisms, and only one company (7.7%) has a supply contract. The picture of the retail segment is quite different, since only 42.9% of the companies do not use formal mechanisms. The 57.1% of respondents who claim to use contractual resources in their transactions cite contracts with governments, and business clients.

Also, 56,16% of farmers affirm that the transactions with the same partner are repeated on an annual or semi-annual basis. Retail, in turn, is the segment with the highest frequency of transactions. Among the surveyed retail enterprises, 13 (92.8%) report that transactions are repeated on a daily or weekly basis with the same partners. In the industrial and wholesale segments, transactions with the same partners are repeated, more expressively, weekly or monthly.

These results reveal a high rate of transactions carried out through the market governance structure. High frequency in transactions becomes a mechanism for discouraging opportunistic behavior, as partners generally tend to preserve longer relationships with less uncertainty and thus less expensive. These aspects lead to building a good reputation among trading partners and reducing transaction costs.

The relevance of informal codes of conduct and behavior is evident in the production segment. To get an idea of this importance, 31.5% of the interviewed producers claim to transact part or all their production with timely receipt and without any formal promise of payment, just relying on the word of the buyer. Also noteworthy is the fact that 100% of the producers heard have never tried to solve any commercial demand through legal means, even bearing losses in some cases.

Regarding uncertainty, farmers report that it is strongly linked to natural factors such as climate, rainfall and pest incidence, but also relate it to price behavior, lack of prices and lack of buyers during the period. harvest, which occurs from March to October. Only six producers (8.22%) of the cassava reported uncertainties and risks related to delinquency. In the industrial segment, the greatest uncertainties are related to the availability of raw material. Nine industrialists interviewed (69.3%) stated that their companies interrupted production due to lack of raw material for at least 2 months a year. As for the risks and uncertainties related to delinquency, there are reports in 23.08% of the companies surveyed. The retailer and dealer / wholesaler segments are those that are less subject to risks and uncertainties. Both do not suffer from the incidence of natural factors and have relative ease to replace suppliers. The risks related to delinquency are reported as moderated by the respondents from the retailer and wholesale / retailer segments, since they do not interfere with the profitability of the companies.

The costs related to the negotiation itself are the contact costs between the parties involved in the transactions. These costs are borne by buyers in both the production segment (54.42 of transactions) and industry (76.9 of transactions). Ex-post costs inherent to the researched production chain are more strongly associated with transportation costs. Producers bear such costs in 57.5% of transactions; the industry supports them in 76.9% of negotiations, and these costs are borne by the retailers themselves in 71.4% of transactions. The wholesaler is responsible for the total transportation costs in the transactions he carries out, although they are passed on to customers. Only 3 retail respondents reported using legal means to resolve commercial claims. An ex post cost reduction strategy widely used by agents involved in the studied cassava production chain is cash sales. 37 producers (50.68%) stated that they sell their products only in cash. In retail, 1 respondent (7.1%) stated that they only deal in cash and credit card transactions.

Although market governance structure is the dominant regulatory instrument of transactions, hierarchies and hybrid forms of transaction control were also observed. Hierarchies are represented by 39.7% of cassava producers, who currently industrialize all or part of cassava production, turning it into flour and / or granules before moving to the next link in the chain. There are two flour industries in the region that have their own cassava crops. One is the largest in the surveyed region, with an extension of 10 ha also characterized by hierarchy. Hybrid forms of governance are represented by the contracts signed by producers with governments (local and federal) and with intermediaries. Table 1 shows the governance forms present in the cassava production chain in the Araguaia Regional Valley.

Table 1 – Governance structures in cassava chain in Araguaia Valley (Goias state, Brazil).

Market	Hierarchy	Hybrid
- Isolated transactions done on spot market	- Farmers and farmers processing cassava into flour - Factory growing cassava for their supply	Contracts: - Farmer x PAA and PNAE - Farmer x Local Government - Farmer x Intermediary - Factory x PNAE - Retailer x PNAE - Retailer x Business customer - Retailer x Local Government

Source: Field research.

5. Conclusions and Outlook

This research aimed to study the cassava production chain in the Araguaia Valley region, Goias state, Brazil, from the perspective of Transaction Cost Economics. It was possible to describe the transaction costs and the governance structures existing in the referred product chain. The results offer strong evidence for corroborating three of the four hypotheses of this work.

The basic hypothesis was corroborated by the fact that approximately 90% of transactions are carried out via the market and without a formal regulatory mechanism. This informality leads to increased reputation of agents, a strong mechanism for reducing transaction costs. This corroborates, therefore, the first secondary hypothesis. In turn, the fact that a considerable portion of the interviewed agents state that they seek to negotiate with familiar and well-known partners shows that transaction cost reduction mechanisms are largely linked to market knowledge and experience, validating the second secondary hypothesis. However, as uncertainties related to buyer availability and market access were also relevant, it can be concluded that the latter secondary hypothesis was only partially validated.

We hope the results highlighted here will serve as a starting point for future research.

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