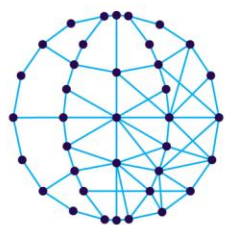




Cooperatives : The Power to Act
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RELATIONSHIP BETWEEN VERTICAL INTEGRATION AND FINANCIAL INDICATORS OF BRAZILIAN AGRICULTURAL COOPERATIVES

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Abstract

Incorporation by diversification strategies of cooperatives is generally used as a means of “competitive set,” and many of them stand out in the market in which they operate. It is believed that the competitive advantages resulting from vertical integration that seeks to reduce transaction costs have a direct influence on financial indicators. Thus, this research is intended to check for influences of vertical integration in cooperatives in relation to the sales margin, net sales, debt level and number of members of sample cooperatives. It was observed that vertical integration influences positively the sales margin, indebtedness, net sales and number of members. The greater the vertical integration, the greater the sales margin, and in turn the greater the indebtedness of the cooperative, higher net sales and increased the number of members of cooperatives analyzed in the sample.

Résumé

En général, les stratégies d'incorporation par la diversification sont utilisées par les coopératives comme moyen de s'établir dans l'ensemble concurrentiel et plusieurs d'entre elles se démarquent sur le marché où elles opèrent. On dit que les avantages concurrentiels résultant d'une intégration verticale vouée à réduire les coûts de transaction influent directement sur les indicateurs financiers. Cette recherche vise ainsi à vérifier, pour ce qui est des coopératives de l'échantillon, l'influence de l'intégration verticale dans les coopératives en lien avec la marge commerciale, le chiffre d'affaires net, le niveau de la dette et le nombre de membres. Nous avons observé que l'intégration verticale influence positivement la marge commerciale, l'endettement, le chiffre d'affaires et le nombre de membres. Plus l'intégration verticale est importante, plus la marge commerciale est élevée et plus s'élèvent en retour l'endettement de la coopérative, le chiffre d'affaires net et le nombre de membres dans les coopératives de l'échantillon analysées.

Resumen

Por lo general, las estrategias de incorporación por diversificación de las cooperativas se utilizan como un medio para establecer un «conjunto competitivo» y muchas de ellas se destacan en el mercado en el cual funcionan. Se cree que las ventajas competitivas generadas por la integración vertical que busca reducir los costos de transacción ejercen una influencia directa sobre los indicadores financieros. De esta manera, la intención de esta investigación es verificar las influencias de la integración vertical de las cooperativas en relación al margen de ventas, las ventas netas, el nivel de deuda y el número de miembros de las cooperativas de muestra. Se observó que la integración vertical tiene una influencia positiva en el margen de ventas, el endeudamiento, las ventas netas y el número de asociados. A mayor integración vertical, mayor margen de ventas y, a su vez, mayor endeudamiento de la cooperativa, mayores ventas netas y mayor el número de miembros de las cooperativas analizadas en la muestra.

Introduction

Agribusiness in Brazil has grown in the past decade. Analyzing the Gross Domestic Product (GDP) of agribusiness, which shows the total output of agriculture and livestock farming in Brazil, there was an average growth rate of 3.18% per year. The agribusiness GDP is on average 23.69% of the national GDP, and a representative sector of the Brazilian economy (Centre for advanced studies in applied economics [ESALQ / USP], 2012). Brazil is in the process of consolidating its position as one of the largest producers and exporters of food, reaching more than 200 countries due to its significant growth in international agribusiness trade. Agribusiness export growth is important for the Brazilian economy and for companies and cooperatives in the sector, as it requires upgrading to new markets, increased production, quality and increased investments in technologies (Ministério da Agricultura, Pecuária e Abastecimento [MAPA], 2012).

In order to improve their efficiency, productive efficiency and competitiveness in dynamic and demanding markets, agricultural cooperatives present themselves as a form of production and agribusiness systems coordination organization. This is because members seek to enter the competitive market, joining forces through its production units. It is worth noting that cooperation between members does not guarantee competitiveness of cooperatives or cooperation between these cooperatives (Lago, 2010). Cooperatives role is to provide better results to their members than what they could achieve individually (Soboh et al., 2009). For this reason, they seek different strategies to become competitive, such as vertical and horizontal integration, strategic alliances, holding company or joint venture, concentration or focus (central cooperative), and of business and product diversification (Ferreira and Braga, 2004).

As mentioned by Gimenes and Gimenes (2006), the survival of agricultural cooperatives depends on its competitiveness. According to Ferreira and Braga (2004), some cooperatives wanted not only survived after the changes in the Brazilian political and economic environment in the decades from 1980 to 1990, but to stand out and increase their market share. Evidence of these cooperatives seeking greater results in the market in which they operate through competitiveness is their ranking among the top 400 agribusiness companies in Brazil's Largest and Best Magazine of Agribusiness Companies Survey. Most cooperatives are part of agribusiness and distribution of inputs are production cooperatives, considered as traditional organizations vertically integrated and diversified (Consoli and Marino, 2013).

Cooperatives are vertically integrated, according to Sexton (1986), due to their economic function to vertically integrate their members in the marketing chain, both upstream and downstream. Integration into a vertical cooperative occurs in cooperative coordination, performed by the horizontal members. Incorporation by cooperatives of diversification strategies is generally as a means of "competitive set," many of which stand out in the market in which they operate, e.g., the Cooperative of Coffee Growers and ranchers of Maringa (COCAMAR) and the Agricultural Cooperative Holambra (Ferreira & Braga, 2004). The main cooperatives with these characteristics carry out activities related to input operations, grain processing and industrialization, and some are already exporting. Others, less diversified, act as distributors but are focused on services, credit operations and customer service. These production cooperatives are concentrated in the South and Southeast of Brazil (Consoli and Marino, 2013).

Thus, this article is justified because of the competitive advantage that vertical integration can provide organizations that adopt growth opportunities. It addresses the research question: Does vertical integration influence certain financial indicators in the agricultural cooperatives listed in the ranking of the Largest and Best Agribusiness Company?

The objective to check for the influence of vertical integration in cooperatives in relation to the sales margin, net sales, indebtedness and number of members of the sample cooperatives. The research is divided into literature review, methodology, analysis of results and conclusions.

Literature Review

Agricultural Cooperatives

Agricultural cooperatives in Brazil are agribusiness sector organizations. The term agribusiness indicates the relationship between agricultural production, industrial activity and distribution, i.e, the term comes to represent all agriculture-based systems: inputs, agriculture, industry, distribution and consumption (Zylberstajn, 2013).

According to the International Cooperative Alliance (ICA) (2015), cooperatives are owned by organizations and managed by and for their members, who have equal rights in the organization's activities and have profit-sharing activities. In Brazil, cooperatives have economic importance. According to the Organization of Brazilian Cooperatives (OCB) (2016), the number of cooperative members is approximately 9 million and they directly generate 298,182,000 jobs, in 2015.

In 2006 in Brazil, approximately 7.61% of its agricultural establishments were members of cooperatives. These establishments accounted for 35% of agricultural income in the same period, i.e., less than 10% of the total accounted for more than one third of industry income (Brazilian Institute of Geography and Statistics [IBGE], 2012). These numbers demonstrate the importance of cooperatives as they boost agricultural activity, adding value and income to the producer (Bialoskorski Neto and Pinto, 2012).

In 2015, there existed 6,587 cooperatives in Brazil, which are segmented into 13 branches of activity: agricultural industry, consumer, credit, education, special, housing, infrastructure, mineral production, health, labor, transport, and tourism and leisure (OCB, 2016). The agricultural sector, the object of this study, is comprised of cooperatives of farmers, agro-pastoral and fishing. Agricultural cooperatives bring services to members, such as the receipt and sale of their production, storage and industrialization (ICA, 2015). There were 1,543 cooperatives in the Brazilian agribusiness sector in 2014, accounting for 23.44% of all existing cooperatives in Brazil. The least significant region in terms of number of agricultural cooperatives is the Midwest, with 13.87%, which represents 214 cooperatives, while the Southeast has 415, which amounts to approximately 27% of Brazilian agricultural cooperatives (OCB, 2016).

Transaction costs and contractual theory of the firm

The owner of a company are the people who share two forms of formal right: the right to control the company and the right of appropriation of profits or residual rights. In theory, the right to control and the right to residual income can be separated and performed by different classes of people (Hansmann, 1996). In practice, these rights are usually performed together. This is because if one who has control does not have rights to the residual income presents little interest on your part in using your control to maximize the organization's gain (Hansmann, 1996). As stated by Hart and Moore (1998), the Property Rights Theory, owners, and retain the right to refuse, also have the right to make all decisions about the assets of the firm which were not specified in the form ex contracts compared to hiring. This is due to the impossibility of completion of contracts in terms of hiring costs.

This situation leads to the need of contract formulation that delineates responsibilities in order to avoid opportunism and reduce bounded rationality of the parties and transaction costs for preparation and execution of these contracts. The agency conflict is an essential contractual view of the firm, developed among others by Coase (1937), Alchiam and Demsetz (1972) and Fama and Jensen (1983). The contracts are necessary from the moment when the transaction should be defined to avoid opportunistic behavior of the parties and owing to the limited rationality. According to Furubotn and Richter (2000), a distinctive feature of New Institutional Economics is the idea that transactions generate costs. According to some estimates, in a modern market economy transaction costs can represent 50% to 60% of the net national product. These transaction costs include the resources used for the creation, maintenance, use and change, among others, of institutions and organizations. They are not easily distinguishable from production, transportation or other costs (Furubotn & Richter, 2000). For these authors, a transaction is the sale and purchase among individuals of property rights on future of physical things. This definition addresses the transfer of sanctioned property rights. Thus, contractual rights should be considered relevant for organizations.

According to Williamson (1996), the transaction occurs when a good or service is transferred through a separable interface technology, when an activity stage ends and another begins. He writes that the Economy of Transaction Costs (ETC) has two main components: the first is more related to the measurement of transaction costs in the economy, while the second highlights governance of contractual relations. Williamson (1996) assumes that the subject of the relationship has bounded rationality, opportunism and is subject their actions. Bounded rationality should be understood as a limitation of the agents to anticipate every possible contingency before making decisions. A premise of ETC is the impossibility of preparing complete contracts that fill all the gaps for both parties.

In a context of incomplete contracts, bounded rationality may or may not make possible for all economic agents to anticipate all future contractual contingencies. The parties should therefore adapt to possible situations that are not covered by a contract. Strengthening the industry by increasing management capacity and financial resources required the establishment of contracts to avoid bounded rationality and opportunism by contractual limitations of the interests of both parties. This occurred due to the spread of corporate capital and the separation of ownership and control. This separation is characterized as management of the means of production, the physical assets and corporate decisions (McGraw & Chandler, 1998).

Thus, transaction cost economics views the problem of economic organization as a hiring issue. In this concept, some implicit and explicit contracts are associated, with hiring costs that can be ex ante and ex post (Williamson, 1985). Ex ante and ex post costs are interdependent, i.e., they must be treated simultaneously and not sequentially. Moreover, they are difficult to quantify. This is because the transaction costs are always evaluated in an institutional comparative mode (Williamson, 1985). Ex ante costs are those related to hiring a shoddy agent and problems due to adverse market selection. With this adverse selection, transaction costs arise. These costs exist because of the delimitation of the firm (Williamson, 1985).

Transaction costs have three causal links: asset specificity, uncertainty and frequency (Williamson, 1985). These relationships make it necessary that the contracts include terms of delimitation and commitment of the parties, in order to control the established terms and performance safeguards of the parties in compliance with the activities. Even with careful preparation of ex ante costs of a complex document of contingencies, it is still incomplete, because to consider every conceivable point in advance is difficult. Contractual safeguards may take many forms, the most common being related to property (Williamson, 1985). According to Williamson (1985), ex-post costs are the poor adjustment costs that are incurred when transactions are misaligned. Both parties incur costs to fix the problems of post-contract gaps. There are also installation and implementation costs associated with governance structures. Finally, costs incurred by both parties aim to ensure effective commitment to the agreement.

Ex-post problems arise because no contract is perfect and it is almost impossible to circumscribe all ex ante costs. Associated with the ex-post problems, agency problems also generate costs due to their agency conflicts. These costs result from monitoring costs of the agent by the principal to ensure that their interests are unaffected and guarantee residual losses resulting from the activities.

Beyond limited rationality, also considered is the opportunistic behavior of the parties when economic agents seek to maximize their utility function to serve their own interests. Self-interest maximization can be described as opportunism, moral hazard and agency problems. Industry strengthening has required increased management capacity and financial resources, establishment of contracts to avoid bounded rationality and opportunism by contractual limitations of the interests of the parties in the business activity. This occurred due to the spread of corporate capital and the separation of ownership and control.

In terms of relationship between property and contract rights, transaction costs consist of the costs of set and account for resources or claims, plus running costs and application of specific duties. Transferring existing property rights and/or contractual rights between individual transactions incurs costs that include transaction costs, information and supervision. Some of these vary depending on the volume and number of transactions, while others are fixed (Furubotn and Richter, 2000). The decision of a company to perform or purchase an activity is a decision to produce internally (make) or buy on the market (buy). For Williamson (1985), to produce means performing the activity, while to buy means depending on an independent firm to perform it, perhaps under contract as presented above, with ex ante and ex post costs. The contract requires control mechanisms along with transaction costs and coordination of contractual relationships.

Vertical integration is the combination of production, distribution, sales and/or other processes within a company. A corporate decision to use the market (a buying strategy) or produce (production strategy) involves a number of managerial consequences, organizational and marketing, which gives this strategy a highly important role in the organization and its management (Besanko et al., 2012). The search for greater efficiency and effectiveness has led to the predominance of production of vertical structures (Macedo et al., 2013; Sousa, et al., 2014.). Several studies show that the efficiencies produced by vertical integration can compensate the losses caused. In most circumstances the maximization of profit by vertical integration enhances the welfare of consumers (Reisinger & Tarantino, 2015).

The two options to produce or buy are two extremes along a continuum of possibilities within vertical integration. Vertical integration, which consists of the activities carried out internally in the company, provides some benefits to organizations who adopt it. Among those, Stern, Coughlan, Anderson and El-Ansary (1996) suggest that vertical integration is a logical strategy to be adopted when: few there are third on the market that can operate satisfactorily; It takes longer and is more costly to switch to new partners if the current partners of the failed channel performance; the terms of a business, processes and products are unique; buying decision is complex and highly engaging; close coordination is essential to the performance of marketing activity; buyers form strong loyalty to vendors, not companies; economies of scale are present in the performance of marketing activities or flows; the environment is highly uncertain; it is extremely difficult to monitor the performance of other links in the chain; it is easier for channel members to use the efforts of others and; transactions are easy and frequent.

For Neves (1995) and Lima, Carvalho & Carletti Filho (2009), the reason for vertical integration is market failure with increasing transaction costs. Expands integrated to the point where the internal organizational costs are lower than the organization through the market; these market failures may be due to imperfect information, externalities, monopoly power and public and collective goods; technological interdependence technically chained and operations; by integrating monopoly reasons.

For Porter (1997), the advantages of vertical integration are to ensure economy of joint operations, and coordination and internal control and information prevent the market. Stable relationships and technology ensure supply and/or demand, eliminate bargaining between the parties, increase ability for differentiation (added value), increase barriers to entry and mobility, enter a high-return business, to defend themselves against market close. For Williamson, the advantages of vertical integration are getting savings on bounded rationality, reducing opportunism, reducing uncertainty, mastering information and obtaining greater satisfaction.

The vertical integration in cooperatives is stimulated by reducing costs through greater bargaining power in the purchase of inputs; improving the supply position in the market, especially when it comes to perishable products; increasing efficiencies of the coordinating capacity of cooperatives; and reduction of risks associated with joint actions (Zylbersztajn, 1994). It is believed that these competitive advantages resulting from the vertical integration seeking to reduce transaction costs exert direct influence on financial indicators such as the sales margin, net sales, indebtedness and a number of members of the cooperative, and this is what we seek to ascertain in this research.

Research Methodology

A study can be classified as exploratory when the goal is to analyze a topic or a research problem little studied. Since the descriptive studies are used when it is desired to describe the properties and characteristics of a phenomenon (Sampieri, Collado & Lucio, 2006).

According to these ratings, this study is classified as exploratory and descriptive research. It can be classified in this way, since it aims to verify its influence there is the vertical integration of cooperatives in relation to sales margin, net sales, indebtedness and number of members of the sample cooperatives. This study is a quantitative approach and logistic regression was performed which, according Corrar, Paulo and Dias Filho (2011), aims to produce, from a set of observations, a model that allows predicting values taken by a categorical variable, often binary, from a series of continuous and/or binary explanatory variables. It was first made a descriptive analysis for a better understanding of the variables.

Sample

The sample consists of agricultural cooperatives present in the ranking of the Largest and Best Magazine of Agribusiness Companies Survey for the year 2012 (EXAME, 2013). Cooperatives identified in the ranking are concentrated in the South Central region of the country, South and Southeast, where are located the traditional Brazilian cooperatives. About 70% of the sample cooperatives are located in the southern region of the country, while 56% of these are in the state of Paraná. Cooperatives that are part of the ranking are concentrated (approximately 87%) in the agricultural production sector, with about 60% operating in the cotton thread and grains.

In the sample, 34 unique agricultural cooperatives had most of the information needed for the study and cooperatives are distributed in the following agribusiness subsectors, or groups (SAGs), according to Table 1:

Table 1: Number of cooperatives by SAG

SAGs	Number of Cooperatives	Percentual
Cotton and grains	17	50%
Poultry and pork	5	14%
Coffee	3	9%
Oils, flour and canned	3	9%
Fertilizers and pesticides	3	9%
Wholesale and foreign trade	1	3%
Milk and milk products	1	3%
Seeds	1	3%
Total	34	100%

Most agricultural cooperatives in the sample were created in the 1960s and 1970s, and 11 agricultural cooperatives focus on industrialization, with significant values on sale of manufactured goods in the

total turnover of the cooperative. All are vertically integrated and have their own brands, the majority use a concentric diversification strategy (product mix). Also included in the sample are three agricultural cooperatives whose activities focus on the sale of inputs, all of SAG of fertilizers and pesticides and in the State of São Paulo. These cooperatives employ a strategy of diversification conglomerate, does not focus on industrialization and do not export.

The other 20 cooperatives in the sample work, besides the activities of sale of raw materials, the purchase and sale of their associated commodities, approximately 50% of the cooperatives group do not export, and most do not use a concentric diversification strategy, only the conglomerate. Our sample belong to cooperatives that operate in the sale of raw materials and the purchase and sale of commodities. Many of these cooperatives industrialize some cases, and some are vertically integrated, but when observed sales in these cooperatives the largest representative volume is the sale of agricultural products (grains and seeds).

Variables Used

Initially it was used as a proxy for size, the selection of variables net sales, total assets and number of employees. To profitability initially been selected variables return on equity, asset profitability and net margin (sales margin). As a proxy for leverage, we selected the index level of indebtedness. When working with several explanatory variables to be observed if they are correlated. The terms multicollinearity and collinearity are synonymous and are used when there is a strong correlation between the explanatory variables (independent), a fact that hinders the correct estimation of the parameters (Gujarati, 2006; Hair et al., 2009). The correlation matrix shows, by the coefficient shown between the variables, the degree of relationship between them. Newbold (1995) defines a range of the correlation coefficients and plays each scale according Board 1.

Board 1: Interpretation of correlation coefficients scales

Correlation		Interpretation
+	1.00	Perfect positive
+	0.70 -0.99	Very strong positive
+	0.50-0.69	Substantial positive
+	0.30-0.49	Moderate positive
+	0.10-0.29	Low positive
+	0.01-0.09	Tiny positive
	0.00	None
-	0.01-0.09	Tiny negative
-	0.10-0.29	Low negative
-	0.30-0.49	Moderate negative
-	0.50-0.69	Substantial negative
-	0.70-0.99	Very strong negative
-	1.00	Perfect negative

Source: Newbold (1995).

Thus, were analyzed by means of the correlation matrix all variables initially selected and inserted in the proposed model. The model excluded those variables with higher correlation (0.5 Newbold, 1995). In the case of variables for measuring size, are with high correlation (0.9453) of the total net sales and asset variables, it was decided to keep the variable net sales. Was considered for exclusion from the total assets variable the fact of working with different SAGs in the sample since, according to the SAG which the cooperative operates, a larger amount of assets or less may be required, depending on the main activity. Thus, the total amount of the asset may not show the actual size of the cooperative when comparing cooperatives in various SAGs, leading to a wrong result.

Another factor taken into consideration to choose the variable net sales is that it is defined by Exame magazine as an indicator to determine the ranking of the largest and best companies. It was decided to maintain as well, initially, the variable number of employees as a proxy to measure size, despite being correlated within the limits acceptable of the variable net sales (0.5002). The three indexes initially selected to measure profitability of agricultural cooperatives have multicollinearity. The variable return on equity has a correlation of 0.7703 with the variable margin sales and 0.8258 with the variable profitability of assets and, finally, the correlation between the variables sales margin and return on assets has correlation 0,8166.

Thus, it was necessary to choose one of the variables to be included in the model because they are highly correlated. This shows that these variables can be explained by the other two. It was decided to keep as a proxy for profitability margin sales. Thus, the variable margin sales were used, indebtedness, net sales and number of members. Exame Magazine (EXAME, 2013) defines each of the indicators mentioned, as follows:

- Sales Margin (Mg_V): measures the net income in relation to sales. Here's the breakdown of adjusted net income in dollars for sales in dollars, as a percentage.
- Degree of indebtedness (Grau_End): measures the level of indebtedness, it is calculated by the relationship between the obligations of short and long term, and the total liabilities.
- Net sales (Vend_Liq): is calculated as the arithmetic difference between the sales amount and sales tax.
- Employees (Núm_func): corresponds to the number of employees on the closing balance sheet date, usually December 31st.

Analysis and Discussion Of Results

Descriptive statistics of the sample

The descriptive statistical techniques are responsible for organizing, summarizing and describing the important aspects of a database. Synthesizing data can lead to loss of original information, but this loss is small compared to the gain that can be achieved with the analyzes from this synthesis of data (Corrar et al., 2011). Descriptive statistics shown in Table 2 include:

- The number of each variable observations (No.) and of cooperatives may vary due to possible absence of information not published by Exame Magazine;
- Minimum and maximum values for each variable;

- Average of the variables that may contain distortions by outliers values that may exist in this set (Corrar et al., 2011);
- The standard deviation (SD), a measure of dispersion, which shows higher or lower variability of results and allows identifying how far the results are concentrated or not around the central tendency (average) of a group of notes (Corrar et al., 2011);
- The coefficient of variation (CV) is a way of expressing the variability of the data without the influence of the magnitude of the variables, namely the variability in the data relative to the average (Shimakura, 2012).

Table 2 shows descriptive statistics of the 34 individual agricultural cooperatives of the sample, in order to verify the behavior of each variable selected initially. The coefficient of variation, which demonstrates the variability of the data on the average, is interpreted so that the lower this coefficient is more homogeneous data set. The variable that has the CV greater than 1 is the number of employees. Which means that this index has a greater dispersion of the data in relation to its average for the year analyzed, the whole being less homogeneous sample data.

Logistic regression results

Among the 34 cases selected, it was observed that 6 cases are absent from the statistical analysis. i.e, 28 cases were selected for the logistic model. According to the classification table below, you can see that 71.4% is the possibility of correct classification of the planned model.

Classification table a,b

	Observed	Provided		
		Vertical (to the CL) - 0-Yes		Correct percentage
		1 No		
		Yes	No	
Step 0	Verticalização (até o CL)Sim	20	0	100.0
	- 0-Sim 1 Não Nao	8	0	.0
	Percentage global			71.4

a. The constant is included in the model.

b. The cut-out value is .500

Continuing the analysis, the following table shows the chi-square model.

Coefficient test for the Omnibus model

		Qui-quadrado	df	Sig.
Step 1	Step	20.681	5	.001
	Bloc	20.681	5	.001
	Model	20.681	5	.001

This model tests the hypothesis that all the logistic equation coefficients are zero. It can be concluded that at least one of the regression coefficient is nonzero. This rejects the hypothesis that all estimated parameters are null. It can be said that they contribute to improve the quality of the predictions. In the same context, there is also the presence of two tests: Step Block and it is the same indicator. Both have strictly equal meanings to the chi-square model.

Continuing the analysis is the summary of the model.

Model Summary

Step	Verisimilitude de log -2	R square Cox & Snell	R square Nagelkerke
1	12.823a	.522	.748

Estimação finalizada no número de iteração 9 porque as estimativas de parâmetro mudaram foram alteradas para menos de .001.

The result R square Cox and Snell this indicating that 52.2% of the variations in the log odds ratio is explained by the set of independent variables (sales margin, indebtedness, net sales and number of members). The Nagelkerke r squared is a version of Cox and Snell adapted to provide results between 0 and 1.

By this measure, it is considered that the model is able to account for about 74.8% of the variations recorded in the dependent variable. In other words, this means that vertical integration influences the sales margin, the level of indebtedness net sales and the number of associated positively. The greater the vertical integration, the greater the sales margin, the greater the degree of indebtedness of the cooperative, higher net sales and increased the number of members of cooperatives analyzed in the

sample of the biggest and best. Analyzing the Hosmer and Lemeshow test, which aims to test the hypothesis that there is no significant difference between the predicted results by the model and the observed, we note that the values were not significant, serving up expected.

Test of Hosmer and Lemeshow

Step	Chi-square	df	Sig.
1	2.997	7	.885

The value of 0.885 indicates that the predicted values are not significantly different from those observed. This is another indication that the verticalization of the cooperative in influencing the sales margin, the degree of indebtedness, net sales and number of cooperative members of the cooperative. If the result was at a level equal to or less than 0.05 means that it is necessary to reject the hypothesis that there are no significant differences between the expected and observed values. The intention is not that, but rather the opposite, i.e., to accept the hypothesis that there are differences between predictive and observed values. Therefore it is always desirable to achieve results greater than 0.05, as occurred in this research, because when higher the better.

Conclusion

In the production of a certain product, vertical integration occurs when an organization takes control of upstream or downstream operations. Vertical integration is the process of adding two or more links in the value chain. Its main advantage is the increased control. The objective of this paper was to verify its influence. There is vertical integration of cooperatives in relation to sales margin, net sales, indebtedness and number of members of the sample cooperatives.

According to the results, you can see that the vertical integration influences the sales margin, the level of debt, net sales and the number of associated positively. That is the answer the research question was answered positively regarding the agricultural cooperatives listed in the ranking of the Largest and Best Agribusiness Company. The greater the vertical integration, the greater the sales margin, the greater the degree of indebtedness of the cooperative, higher net sales and increased the number of members of cooperatives analyzed in the sample.

The results are consistent with that proposed by theory. Plus, apply to cooperatives which have a distribution of property rights differently from traditional organizations. This can serve as an incentive for cooperatives to adopt vertical integration strategies within the organization to achieve competitive advantage, higher financial results and hence larger and new markets.

Tables, Boards and Graphs

Table 1 – Descriptive statistic to the year of 2012

	2012					
	N*	Minimum	Maximum	Average	DP*	CV*
Mg_V	32	-1,0	9,0	2,3	1,6	0,7
Grau_End	33	74,8	111,8	92,6	7,4	0,1
Vend_Liq	33	95	1.601	490	385	0,8
num_func	33	209,0	7281,0	1610,2	1812,5	1,1

* N = Number of observations for each variable

*CV = Coefficient of variation

*DP = Coefficient of variation

Source: Results from SPSS

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