Agricultural Cooperatives: Economics and Capital Structure

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Summary

This study discusses about agricultural cooperatives capital structure with the New Institutional Economics approach, in particular the Transaction Costs Economics point of view. At the end, it is possible to conclude that the co-operative enterprise, as a consequence of the financial governance costs, presents a wider structure of transaction and agency costs, when compared to other forms of business organization.

An econometric model and graphic analyses are elaborated showing that when the co-operative is a smaller proportions organization it presents lower financial governance costs, however, when it develops, the transaction and financial governance costs also grow, and the co-operative displays higher costs than the non-cooperative enterprises.

This issue also shows that Transaction Costs Economics theory is efficient tool to explain the organizational capital structure and the micro-analytical details not yet appreciated by the usual analyses.

Key Words: Transaction Costs Economics, Agency, and Cooperatives.

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1. Introduction

The co-operatives present a particular structure of organization, as compared to other organizational architectures; the co-operatives do not initially intend to obtain business profits, and at the end of the account period they present only operational surpluses, which are distributed "pro-rata" and are proportional to the operations of each associate during this period.

In this organization, the associate is simultaneously "client" and "owner" of his own business, with some specific problems of separation between property and control. Because of this characteristics, among others, in cooperatives is necessary a specific approach, like the analysis of contractual relationships, to explain the organizational dynamic.

Nowadays, some modifications are perceived in this organizations, it is possible observe fusions in the U.S. dairy sector, in Canada, the Saskatchewan Wheat Pool opened its capital by means of the Toronto Stock Exchange, and in the U.S. there are examples of co-operatives called *New Generation Cooperatives.*

2. The institutional nature of the co-operatives

To analyze the co-operatives it is necessary understand some important factors in the formation and maintenance of economic coalization. Basically, cooperation only is established among the agents when it is more interesting for the group as a whole. So, the institutional point of view of property rights, division between property and control, transaction costs, and agency problems, could be a sufficient tool to analyze this organization.

Fulton (1995) show that the property rights theory can perform a central role in the institutional theory and property rights means the right to have power, to consume, to obtain an income or transfer assets. In cooperatives, the associates withhold residual rights in the income flow generated by the organization. However, the assets property rights are divided among several people, and there is not a complete separation, the owners are not allowed to take complete possession of the flows arising.

When the income flow generated by an asset exists without complete distribution of property rights, the economic agents try to engage themselves in a process to take a greater share of the results from this asset. In particular case of the co-operatives this associated strategy reduces the generation of assets benefits.

Zylbersztajn (1993) describes that the co-operatives are organizations with property rights above the corporations, since each member has the power to interfere in the company performance, not proportionately to his participation in the capital or as a stockholder, but according to the principle that each individual has only one vote – the doctrinal principle "one man one vote".

Fulton (1995) mentions Barzel and indicates that, when common property rights exist among several people, they are directly confounded with free access resources. This leads to another situation in which a group exerts the ownership rights with management duties obeying formal rules – statutes – and informal rules – ethics - and, thus, the available resources are not totally exploited.

In the co-operatives, there are common rights to the property, while in the investor-oriented firms - IOF's this right is individual, with clearly defined boundaries, and the capital owner has residual rights to the income.

This difference is important, the property rights of a firm can be negotiated in the Stock Exchange and transferred from owner to owner; but this does not occur in the co-operatives, implying in different transaction costs for each of them. Eggertsson (1990) states that the ability each owner has to negotiate his residuals claimant with low transaction costs is a very important aspect for the investors-oriented firms. The worse distribution of this specific right, over the income, could cause the associate to withdraw from the co-operative system.

Milgrom and Roberts (1992) describes that in a co-operative there are a limited rights to enterprise results, and the lack of concentration in a property rights not only propitiate the associates few incentives to directly participate in the business administration, but also, induce them not choose for the long-term investments.

Thus, there is a basic difference in the agency cost structure between the co-operatives and the investor oriented firms - IOF's. The higher costs due to non-separation between property and control in the cooperatives, because there is not a clearly defined property rights structure, could influence in the transaction costs associated to the transference of the rights of participation.

Characteristically, the cooperators – associated in the cooperatives - are at the same time, users and owners of their business. Using agency concepts, the associates will be, simultaneously, agents and principals of the same contractual relationship. Bialoskorski Neto (1994) states that this relationship can lead to a situation of ineffectiveness for the co-operative, since in the general assemblies and in moments of economic definitions, this associate-agent can determine, as principal of the contractual relationship, his own payment or his income.

The agricultural co-operatives transactions occur with geographic specificity characteristics, since the agricultural products need a certain combination of ecological factors for their development. Thus, frequent transactions with high specificity of assets determine a bilateral or unified governance structure for these contractual relationships.

The institutional environment is also important in the co-operative characterization. Cook (1995) defines five stages since appearance, then growth, and finally extinction of this form of organization, by means of an institutional reading.

Cook (1995) describes that the investor oriented firms - IOF's increases the prices for raw materials, or reduces the prices of the agricultural commodities, making untenable a different from cooperatives organizations which aims to increase the agricultural income. The same author states that, if the cooperative survives in concentrated markets, in the following stage, their prices and conducts will not differ from the investor oriented firms - IOF's; however, they will present higher transaction costs, due to the property rights distribution, and thus, will present competitive disadvantages.

In the last stages the cooperative could be adapt to a new structure, which minimizes the transaction costs and their disadvantages, thought: a) establishing strategic alliances with the investor oriented firms - IOF's, b) becoming an organization which has better established property rights, c) extinguishing for transform in a IOF, or d) closing and disappears.

The institutional analyses allow to apprehend that the doctrinaire principles, in which cooperativism is grounded, influence directly the enterprise success. According Bialoskorski Neto (1994) a) the principle of democracy demands high transaction costs, when decision making occurs by means of general assemblies; b) the equality principle, one

man one vote, implies directly in high costs of agency derived from the lack of incentives for the productive activities; c) the principle of solidarity, and the non-existence of profits, makes impossible a clear delimitation of property rights, leading to high costs not only for agency but also for transaction.

On the other hand, it is also necessary analyze the capital structure and performance for discusses about the growth process, to aim cooperative enterprise survival in competitive markets, and neo-institutional analysis must be taken into consideration in order to consider transaction and agency costs in this organizational process.

3. Capital Structure and the Transaction Costs Economics

The Transaction Costs Economics-TCE approach, based in the characteristic of the transactions and assets, could understand the financial corporation analysis. The assets specificity characteristics influence the investments, the capital structure, and the financial governance.

To develop TCE analysis, Williamson (1996) assume that there are a capital structure characterized by the situations, enterprises with open capital in stocks exchanges, or the situation in which the enterprise financing exclusively by the bank loans.

These two opposite situations must be associate the idea of financial governance. A hierarchical governance, due to the process of opening the capital called “equity” - in which the necessary financial resources are obtained inside the company by shareholders - and a governance via market called “debt”, when the firm is financed by means of loans.

In the case of governance via market – “debt” - the financial agent, bank, settles a certain interest rate for the operation, and the capital cost is also embedded with the

transaction costs of the operation. The agent also consider the period to pay the loan, the liquidity of the business, and the guarantees, in order that, in case of non-payment the operation can be duly honored.

Williamson (1996) assume that probably occur, for more specialized business, a growth of assets specificity used in the transformation process. This implies, directly, in a certain degree of impossibility to use these assets in other activities and a lower level of liquidity in the market. That is, in case an asset has to be sold it probably will worth less than its actual financed value, since it cannot be used in alternative activities with the same grade of utilization and generation of income. In case of non-payment or bankruptcy of the firm the assets would be non-effective guarantees of the financial operations, and can also need complementation, as a function of worth difference and uncertainty of the situation.

Thus, if it were considering, at first, a competitive financial market the financial agents will have approximate operational costs and, second a competitive economic situation, the firms, of a particular economic sector, would also present approximate income levels.

Loans as a financial operation are different due to their cost, among other aspects, due to the uncertainty that the financed amount is paid back, a direct function of the guarantee liquidity and, as a consequence, of the assets specificity.

Financial governance costs through the market – "debt" - is positive and grows proportionately to the growth of the assets specificity - **k**, that is, inversely proportional to the guarantee liquidity. Defining these costs as **D(k)**, has:

$$d(D(k))/d(k) > 0$$

On the other hand, in an opposite situation, financial governance totally inside of the organization boundaries - financing operations by means of open capital – could be distributed property rights and business risks and the composition of the transaction costs is different.

The importance of the assets specificity for determination of the transaction costs is diluted in consequence of a greater number of investors, and of the proportional participation in the business income. Since each invested amounts are reduced – divided among many investors – some costs are also reduced, due both to the uncertainty of the operation and the possibility of failure of the firm. This characteristic only exists because IOF's have a different distribution of property and the decision rights inside the company.

Thus, following Williamson's (1996) arguments, one can notice that, as the assets specificity increases, a more adequate capital structure can appear according to the transaction costs and contractual relationships aspects in the enterprise.

In the structure called "equity" – **E(k)** - the transaction costs increase proportionately to the growth of the assets specificity, so:

$$d(E(k))/d(k) > 0$$

Comparing the two structures, "debt" and "equity", both grow according to the assets specificity, but some differences can be observed. When the assets specificity is very small, there is high marketability for them due to the existence of **n+1** possibilities of alternative applications in several different economical sectors; the uncertainty is very

small considering the differential between worth of these assets, the invested value and the market value, implying in a high level of security for bank operation.

These characteristics reduce the financial costs. As a consequence, the operation can be more adequate, presenting lower costs than the owned capital that, in many cases, can be used in other applications with higher financial results.

Consequently, one can consider that **D(k) < E(k)** when **k=0**. Therefore, when the company has a low level of assets specificity, the structure "debt" is more efficient under the transaction costs point of view. As this specificity grows, the costs of the structures "debt" and "equity" are modified, and behave like this:

$$\mathbf{d(D(k))/d(k) > d(E(k))/d(k)}$$

Transaction costs associated to the capital structure "equity" grow proportionately less than the financial and transaction costs of a structure based exclusively in bank financing, when the assets specificity varies.

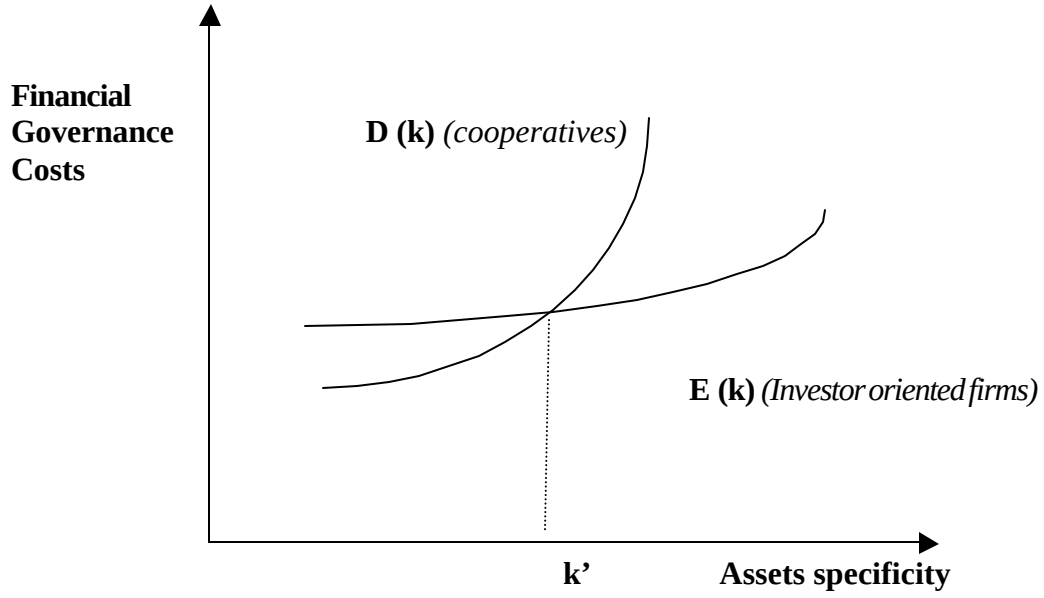
Williamson (1996) modeling and comments this situations, and describes that when assets present a high potential of reutilization will be financed, preferentially, with loans – "debt" – and those which can not be redeployable in other alternative activities, preferentially, with owned capital – 'equity".

Figure 1 shows the representation of the transaction costs variation, as a function of the assets specificity, given a certain level of financial governance. When **E(k) = D(k)** , there is **k'** representing a boundary between the financial governance structures "debt" and "equity".

On the other hand, the cooperatives also would be located in the curve **D(k)** in a function of the difficulty to capitalize and grow with owned capital, scarce among the associates, and, consequently, their direct dependency from "debt" to finance. In other size for profits enterprises – IOF's - can be characterized by another similar curve. Thus, it is possible compare IOF's financial strategies and cooperatives strategies in function of the costs of capital in particularly situations.

Figure 1

Financial governance costs as a function of assets specificity. D(k) – debt; E(k) – equity.



Source: Hendrikse (1993) and Williamson (1996)

Adapting the model of Williamson (1996) and comment the Hendrikse (1993) model, it is possible analyze the financial governance costs of the cooperatives organizations when it is compared with the IOF's. This situation is a generalization of strategies but could explain the cooperative debt structure.

4. Theory application for cooperatives

The objective of this section is discusses about the cooperative organization growth according New Institutional point of view, analyzing the financial governance. So, intent analyzes the hypothesis of the financial governance costs occur as a function of the architectural arrangement of contractual relationships, assets specificity level. For this, comparing the cooperative organization structure with nom-cooperative enterprise – IOF's.

The econometric procedure for these analyses presents limitations according to Masten (1994), who defines an econometric model as: $\mathbf{C^1 = b_1X + e_1}$ and $\mathbf{C^2 = b_2X+e_2}$, where **C** represents the governance costs, **b** are the parameters, **X** an observable attributes vector concerning transactions, and **e** the associated error.

Thus, as the vector **X** is unknown in its totality, the parameter **b** analysis is difficult and the model is unable to obtain any absolute and significant number to quantify the transaction cost. On the other hand, according to Masten (1994), **i**t is possible analysis of the model if it is comparing dimensions and concluding that there is a probability of occurrence of a certain cost lower than another, that is $\mathbf{C^1 < C^2}$, and in order to discuss that probably must be some governance structure occurs.

Thus, indirectly, it is possible to consider a situation where probably a certain type of governance would appear as a function of the transaction costs and assets specificity, comparing the two models.

According to this initial discussion, it is possible to construct a model that can formally attest the difference among the financial governance costs as a function of the assets specificity. To attain this, the information of the fixed assets of the company – **FA** - as a vector is used as a "proxy" of the assets specificity.

Williamson (1996) explains that several assets considered by the accounting department as fixed do not present specificities, can be easily used for other purposes, as buildings or houses, and do not serve as parameters of the specificity. On the other hand, other assets not considered by the accounting department have great importance concerning specificity, as the human capital.

However, this paper assumes that the assets specificity **K** is a function which depends of various forms of occurrence – **K(f)** physical, **K(g)** geographical, **K(h)** human, **K(t)** temporal, **K(d)** dedicated, as follows:

$$\mathbf{K = f\ \{K(f),K(g),K(h),K(t),K(d),\ w\}}$$

Here **w** is a vector representing other non-considered factors. So, the specificity is given not only by the simple addition of different specificities, but also by the interaction among them. Thus, a fixed asset, in a setting where a strong geographical specificity exists associated to a temporal specificity and dedicated assets, presents necessarily also strong assets specificity. The specificities, physical **K(f)**, geographical **K(g)**, dedicated **K(d)** and temporal **K(t)**, inherent to the agricultural activity, hinder the reutilization of these fixed

assets; there is not a significant liquidity of these investments, presented to the investors and financial agents as specific assets. We have, then:

K(f,g,d,t) > 0, and **d K(f,g,d,t) /dg > 0** and **dK(f,g,d,t)/df > 0**

Thus, in this particular case of the agricultural enterprises, the "proxy" – **FA** – of the invested asset would function to reflect, indirectly, the assets specificity **k**.

That is, it could as a hypothesis reflect the same variations of **K**. Therefore, one can write: **DK @ f (DFA, w)** , only when **K (f,g,d,t)**. The variation of the assets specificity, in this particular case, is a function of the variation of the variable **FA** and of the vector **w** composed by other already discussed relevant variables.

The variable chosen as "proxy" of the financial governance cost was the long-term liability – **LTL**. This variable shows the size and the *quantum* of the long-term indebtedness of the enterprise with third parties. Long-term was considered since the analysis of the short-term financial turnover can be liable to errors.

What is under the focus of analysis is the proportion by which **LTL** varies when **FA** varies for each particular type of organizational architecture, that is, when the co-operative societies and the non-co-operative societies are compared, considering the governance of each.

There must be a directly proportional relationship between **LTL** and the financial governance costs **Cgf** , reflecting as financial transaction costs *ex ante* the elaboration of contracts, identification of sources, comparison of attributes and *ex post*, those related to management of resources, monitoring of relations and payment flows, and others. These transaction costs are aggregated to other costs of these operations, as those related to

collecting resources, risk and liquidity that, summed up to figure the operation, will be consolidated as the total cost of the capital **w**. Therefore, we can write down:

$$DLTL \propto f(DCgf, w)$$

A relationship between the natural logarithm of the financial governance cost "proxy" is used as dependent variable, and of the assets specificity "proxy" as explicative independent variable, according to the model:

$$\ln LTL = a + b\,FA + e$$

The model was adjusted for two cross-section series of data referent to the account period of 1995, retrieved from the patrimonial balances published and available during 1996, respectively for the co-operative societies and non-co-operative organizations, as the corporations, exclusively of the food agroindustrial sector. The list of companies was taken from the list of the largest agricultural co-operatives of the *Organização das Cooperativas Brasileiras* (Organization of the Brazilian Co-operatives) OCB, analyzed and available in the data bank of the *Fundação Getúlio Vargas – FGV* Agroanalysis Magazine. The data for the non-co-operative enterprises of the food sector proceed from the same source, the *Centro de Estudos de Empresas da FGV* (FGV Study Enterprises Center).

This model, tables 1 and 2, represented in figure 2, depicts curves and relationships studied by means of an exponential function. It is also important to emphasize that a relationship among variations is sought, that is, the inclination of the theoretically studied curves. This way, the model can express different relationships among the variables for each group of companies – directly or indirectly proportional – and with several possibilities for different inclinations.

Table 1

Result of regression, presenting the relationships between the dependent variable Ln LTL and the explicative variable selected for agricultural co-operatives in Brazil.

	coefficient	statistic T
Constant	**15.8233**	**66,6948**
FA	**1.0400E-08***	**3.9649**
R^2 0.42		

**** coefficient significant at the 0.5% level***

Source: agroanalysis and research data

Table 2

Result of regression, presenting the relationships between the dependent variable Ln LTL and the explicative variable selected for non-co-operative enterprises in Brazil.

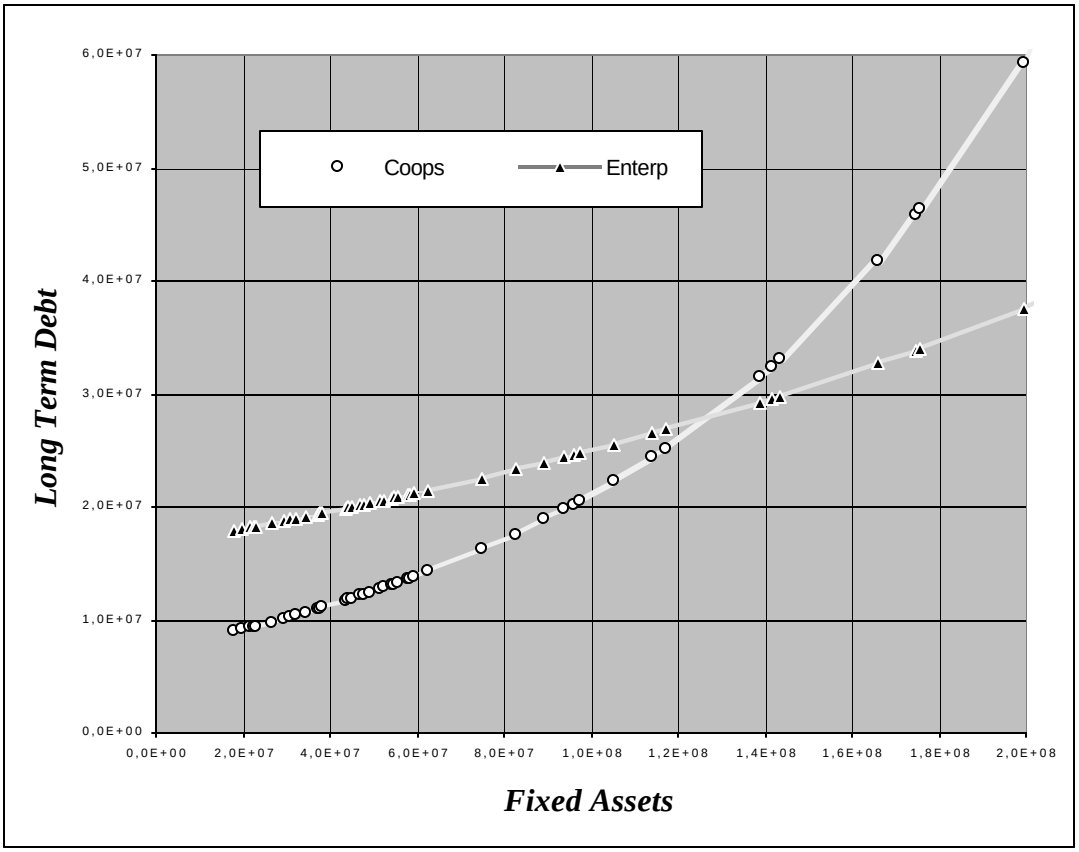
	coefficient	statistic T
Constant	**16.62727**	**59.9486**
FA	**4.0971E-09***	**5.1733**
R^2 0.37		

**** coefficient significant at the 0.5% level***

Source: agroanalysis and research data

Figure 2

Graphic representation of the results obtained with the regression model presented for the co-operatives and non-cooperative companies of the Brazilian food sector.



These data refer to the 1995 account period, extracted from the published and available patrimonial balances during 1996. Source: Results of regression and data from FGV, 1996.

Figure 2 shows two estimated curves with relations, between two variables, directly proportional exponential relationships, as well as relationships among the inclinations – elasticity – also similar to the theoretical model, figure 1. The objective of the models is not

establish a forecast model, but a statistical approximation, exploiting the business data, that can serve as an initial parameter for the discussions.

These results show an expected inclination, that is, the two curves behave as theoretically anticipated, in the figure 1, this can be observed in figure 2. This is perhaps the merit of the adjusted model: show the relations of variation among the variables compared in the two different groups of companies, and also calculate the elasticity – that maintain a constant relationship and show the variation relationships anticipated for the two groups.

5. Final Considerations

The mainstream conclusion is the New Institutional Economics, Transaction Costs Economy, could offers instruments that complement the analyses of the capital structure of the companies, explaining details not yet clear enough to the usual theoretical analyses, particularly the concepts of financial governance. In according of the econometric model, and two estimated curves, could be conclude that there is probability that the theory model is correct and explains the financial governance structure.

It is possible to conclude, in other size, another important applications to comprehend the cooperatives organization. Considering the necessary growth of the co-operative enterprises, these organizations have a more than proportional increase in financial governance costs when compared to non-co-operative enterprises.

Therefore, a limiting boundary exists where new financial governance strategies are necessary on the part of the co-operative organizations. The elasticity of long-term liability

of the invested asset for the co-operatives is larger than the same elasticity for the non-co-operative companies.

The co-operatives which are first part of curve, before de cross boundary, possibly present greater efficiency under the light of the financial governance than the non-co-operative enterprises, and thus, an adequate form of production organization. Finally it is possible understand, explained by the financial governance, why some disinvestments are occurring in the agricultural co-operative in Brazil and the effort of Brazilian cooperatives organizations to find a new capital structure.

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