



Determinants for the cost of equity in agricultural cooperatives

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Abstract

Cooperatives have peculiarities regarding their equity. Among others, the equity is nontransferable and there is an obligation to refund if requested by the member. Also, the return on investment can be in the form of favorable prices, services and cash patronage. From these statements, the understanding of the motivation to increase capital in a cooperative becomes necessary. Therefore, the aim of this study was to estimate the cost of equity, parameter used by an investor to make a decision, and investigate its determinants. Using data from 2010 and 2011 for cooperatives in the states of São Paulo and Paraná, this study employed a technique adapted from Gordon's model to find the return required by the member. It was also used a panel data technique to find estimators for the determinants mentioned by literature. The results pointed to the lack of significance of location in the composition of the cost of equity and the return on assets having predominant role, with little impact from the others. These results may be indicative of preference for present returns compared to future expectations, also the lack of investment options for the producer from Paraná. The progress of this work can develop a line of research beneficial to understanding the return expected by the member and the financing and administration of cooperatives, based on the refinement and adaptation of finance techniques to the reality of these organizations.

Keywords: Cost of equity. Agricultural cooperatives. Risk and return.

Introduction

Cooperatives are economic organizations which differ in relation to others, among other things, by the fact that the owner also is the user of products and services generated by the enterprise (BOLAND; BARTON, 2013; BORGES; AARSET, 2016). Also, for Hansmann (1996) it's particularized by three aspects: the distribution of net income, the form to exercise control and its own characteristics of property rights. The distribution of net income to the member happens in terms proportionally to the activities performed by them with the cooperative during the exercise, while the control is given by the so-called principle of "one man, one vote". In addition, the entry equity for the cooperative are only redeemable and non-tradable.

These cooperatives characteristics direct and assist to conceptualize the vaguely defined property rights noted by Cook (1995). The lack of definition causes five management problems in these organizations: free rider, portfolio, horizon, control and influence costs. Specifically, the first three affect the ability to invest and produce difficulties in the capitalization of cooperatives.

The discouraging in investment is startled by the lack of a market for members' shares. In other words, due to the inability to market their property rights, added to uncertainty regarding the respect for the owner's contract, the member is not stimulated to allocate more capital units in the cooperative (CHADDAD; COOK, 2004).

On what has been pointed out, it has become necessary to understand the member decision-making process to allocate capital into the cooperative, considering all the characteristics of this type of organization. The cost of equity, by its character of opportunity cost for an investor, is the parameter found to measure the expected return for the member who has invested or will invest their capital in the cooperative. On the side of the cooperative, the cost of equity is presented as the return that it should offer to their member so that they're satisfied with its activities, with this return being possible in the form of favorable prices, services and cash patronage.

The objective of this study is to estimate the cost of equity for agricultural cooperatives in the states of São Paulo and Paraná, and evaluate which factors influence the formation of this value for current members and possible future members. In addition, the estimation of cost of equity for agricultural cooperatives has always been a challenging object, due to the difficulties in applying traditional finance techniques because of the absent of market for their shares (PEDERSON, 1998).

The main limitation of this paper is the starting point in cooperative finance research. As pointed by Boland and Barton (2013), this usually originates from the concept of corporate finance, seeking to maximize profits. However, this simplification makes conflicted the concept of objective functions for cooperatives. This follows from the fact that this function consists of the best blend of surplus of the cooperative activity and the improving provided to producers' rural activities (BOLAND; BARTON, 2013).

Besides this introduction, this paper contains five more sections: cost of equity for agricultural cooperatives and determinants for the cost of equity in cooperatives, presenting and elucidating key themes of this paper from the literature review; sample and methodology, with sample description and origin, the methodology to estimate the cost of equity, variables that will be investigated and form of analysis; results and dis-

discussion, with analysis results; and conclusions, with discussion about the inclusion of the results in a general parameter of cooperatives and possibilities opened with this paper.

Cost of equity for agricultural cooperatives

Cooperatives are a form of collective action found by producers to address market failures such as monopsonies, oligopsonies and cartels. Moreover, act as countervailing power, promoting a balance of market forces, providing increased welfare for the producers in the region (NOVKOVIC, 2008; AZEVEDO; ALMEIDA, 2009).

For Barton (1989), cooperatives present three characteristics: the user is the owner; the user is the controller; and the user is the one that receives the benefits. Also, the property rights, reached by acquiring shares, is nontransferable and is only redeemable (HANSMANN, 1996). This leads to problems by the dispersion of ownership, which becomes vague. At this point, Cook (1995) lists three issues related to the investment by the vaguely defined property rights: free rider, portfolio, and horizon. Also, the return to the member is made using the cooperative's services – the more he gets involved, the more benefits he extracts (BOLAND; BARTON, 2013).

Equity is the investment made by the owners in an organization. In the case of cooperatives, it is expected that the members contribute with capital proportional to the benefits received in the past and in advance to future expectations. The equity should also allow the cooperative to operate on a competitive market and show solid for external users (COBIA; BREWER, 1989; BOLAND; BARTON, 2013).

Although there are many previous studies on management of equity by cooperatives (BOLAND; BARTON, 2013), there aren't many on the producer's decision-making process to allocate capital beyond the share in the cooperatives, which doesn't happen very often (ROYER, 1985). It is expected by theory that the member compare the benefits offered by the cooperative with the alternative investment options to decide, leading to the concept of cost of equity (PRATT, 2003). So, the cost of equity is the return expected by an investor on the capital invested, who takes this amount as the parameter to decide whether to invest or not in a certain business – the opportunity cost. However, Royer (1985) points out that there are no certainties that cooperatives provides adequate return, in the form of benefits, to the capital invested.

Pratt (2003) seeks to list some key concepts about the cost of equity in order to conceptualize it: is the rate of return expected by the market, extending to investors of this market; is function of investment and its risks and returns; reflects the return expectations; it is based on the assets market values, not the book values; and is the discount rate that equates expected future returns of the investments life with its present value at any given time. Also, Ross, Westerfield and Jordan (2005) point out that the return of an asset should be linked to the size of its risk.

The cost of equity has several utilities for management, such as assistance in the identification of viable projects and cash usage, to compare profitability of different projects, and to calculate the value of a company (PEDERSON, 1998).

Cooperatives present some problems regarding the cost of equity. For Boland and Barton (2013), one must understand the member vision to estimate the opportuni-

ty cost. For example, as user the member expects to sell products at high prices and consume services for low values; as owner, the expected would be the reverse, given the possibility of receiving the surplus.

This dichotomy can be even more profound in terms of the basic benefits generated by the cooperative. These can be favorable pricing policies, access to difficult markets, assistance in negotiations with suppliers, distribution of surpluses, and availability of services and various supports (BIALOSKORSKI NETO, 2007; BORGES; AARSET, 2016). Note that each of the benefits generated tends to affect differently the cooperative's accounting. For example, the improvement in the pricing policy offered for the member reduces the surplus of the period, as well as maximizing surplus policy tends to make the options of services provided less attractive.

There is no consensus on a final measurement of the cost of equity due to heterogeneity of interests among the many owners of an organization (PEDERSON, 1998). The characteristics of a cooperative makes this problem even more complicated. For example, the absence of a capital market for cooperatives does not allow the application of the Capital Asset Pricing Model (CAPM), the most traditional model to estimate the cost of equity. This occurs due to the β coefficient, essential in calculating the CAPM, which is found from the correlation of historical series of shares' returns and the return from the market (PEDERSON, 1998).

Another key point is the measurement in a single indicator for the many possible objective functions of a cooperative. Boland and Barton (2013) point out that customarily research on cooperatives runs from a maximizing profit point of view - the surplus in the case. The vision of the surplus as a cooperative's return allows adjustments and measurements from the traditional finance techniques, although the effect of other benefits is not perceived (PEDERSON, 1998).

Determinants for the cost of equity in cooperatives

As k_e represents the opportunity cost for the cooperative to capture the resources it shows this rate as the minimum necessary required by the member to contribute in the cooperative. With this definition in mind it is possible to explore the determinants for the cost of equity in this particular type of organization.

Pratt (2003) shows the cost of equity as the market rate of return in which it appears. Thus, different markets can affect in different ways the cost of equity for a company. Moreover, the location of a cooperative tends to influence its vision for the return, per investments possibilities within reach. One state with many options can increase the opportunity cost of allocating equity to the cooperative.

H1: The location of the cooperative influence positively the formation of the cost of equity.

For Boland and Barton (2013), Parliament and Lerman (1993) and Beaver, Kettler and Scholes (1970), larger companies tend to benefit more from economy scale and scope, and they are more mature, solid and diversified. These features allow cheaper intake of equity and ensures more security to those interested in allocating capital to the cooperative. Even so, for the authors, the size of the company, due to

highlighted aspects, causes the expected result to be negative on both capital costs, because it reduces the business risk in which it appears.

H2: Larger cooperatives generate greater security to owners of equity invested. Thus, it is expected that the cost of equity required by the member presents an inverse relationship with the size of the cooperative.

Fama and MacBeth (1973) indicate that the hypothesis on returns reflect the risk aversion of investors can't be rejected. Therefore, investors look to the company's return when comparing with the possibilities available – it is a possible opportunity cost. Even so, for Lazzarini, Bialoskorski Neto and Chaddad (1999), cooperatives have in their productive structure many specific assets, characterized by its high risk and the possibility of return. On that account, it is expected that the return offered by the cooperative is high as compensation. Considering the cost of equity as measurement of the minimum return expected by the member, higher returns increase the member's expectations regarding the cooperative.

H3: Cooperative members increase their expectations regarding the equity invested as the cooperative returns their resources.

Beaver, Kettler and Scholes (1970) mention that the liquidity of an asset is related to their risk and return – ergo, the cost of equity. Furthermore, researches in the US market shows that investors' orientation time – directed to short or long term – impact the view of the importance of liquidity (BEKAERT; HARVEY; LUNDBLAD, 2007). To the last statement, adds the horizon problem pointed out by Cook (1995), in which the members prefer short-term returns. Thus, in the case of cooperatives, current ratio is presented as a positive determinant of the cost of equity.

H4: The cost of equity of a cooperative is positively influenced by the current ratio because it is related to a short-term indicator, given the horizon problem found in cooperatives.

Sample Description and Methodology

The object of study of this paper are the agricultural cooperatives in the states of São Paulo and Paraná. The choice of these states was due to highlighted importance that their cooperatives receive. The data was collected along with the Observatory of Cooperative Organizations - agreement between the Brazilian Cooperative Organization (OCB) and the School of Economics, Business Administration and Accounting at Ribeirão Preto, University of São Paulo (FEARP-USP). A total of 75 cooperatives were selected using data of two years – 2010 and 2011 –, 53 from Paraná and 22 from São Paulo. Table 1 presents the descriptive statistics of the sample used in the research, considering the year 2011.

Table 1 - Descriptive statistics of the sample for cooperatives in 2011

Account		São Paulo	Paraná	Total Sample
Total Assets (R\$)	Average	116.000.000	345.000.000	272.000.000
	Median	25.900.000	66.500.000	36.600.000
	Standard deviation	252.000.000	667.000.000	577.000.000
	Minimum	307.803	64.656	64.656
	Maximum	1.330.000.000	4.500.000.000	4.500.000.000
Net Worth (R\$)	Average	47.900.000	139.000.000	110.000.000
	Median	7.712.151	17.600.000	11.400.000
	Standard deviation	108.000.000	321.000.000	274.000.000
	Minimum	115.976	21.840	21.840
	Maximum	502.000.000	2.350.000.000	2.350.000.000
Capital Stock (R\$)	Average	5.723.033	18.500.000	14.400.000
	Median	1.287.262	4.392.473	3.404.625
	Standard deviation	13.800.000	30.900.000	27.200.000
	Minimum	12.921	2.150	2.150
	Maximum	74.300.000	148.000.000	148.000.000
Surplus (R\$)	Average	1.298.607	4.540.743	3.497.297
	Median	80.497	352.409	236.133
	Standard deviation	6.558.271	22.300.000	18.800.000
	Minimum	(27.200.000)	(106.000.000)	(106.000.000)
	Maximum	26.300.000	162.000.000	162.000.000

Source: the authors, using Observatory of Cooperative Organizations data.

As is noted in the table, the numbers show that the Paraná cooperatives are larger than the São Paulo ones. In other words, the median cooperative sample located in Paraná is larger than those located in São Paulo. For example, the median cooperative in Paraná has 66,5 million total assets, 17,6 million of net worth, 4,39 million of capital stock and generates 352 thousand of surplus. São Paulo, however, presents medians of 25,9 million in total assets, 7,7 million net worth, this being approximately 1,3 million in capital stock, and makes 80 thousand in surplus. From the sample, it is inferred that the median cooperative in Paraná had almost twice the size of São Paulo cooperatives, three times the amount of paid-up equity and providing surplus four times over. The minimum and maximum values for both states also demonstrate the wide variety of sizes and surplus found in the used sample.

Pederson (1998) proposed an adaptation of the Gordon's model for dividend growth as a possibility to estimate the cost of equity for agricultural cooperatives. Gordon and Shapiro (1956) developed a model for dividend growth in which it depends on just three variables: the value of dividends in the next period, a profit growth rate and the cost of equity. Below, Gordon's model is presented:

$$P_0 = \left(\frac{Div_1}{k_e - g} \right) \quad (1)$$

In (1), P_0 is the theoretical share price, Div_1 is the anticipated dividend, k_e is the cost of equity and g the annual growth rate of earnings per share.

From (1), it is possible to isolate the cost of equity as shown in (2):

$$k_e = \left(\frac{Div_1}{P_0} \right) + g \quad (2)$$

Since then, Pederson (1998) suggests changes to provide the calculation of k_e for cooperatives. The author also states that as g becomes constant you can set it from the multiplication of the return on equity (ROE) by a retention rate r , from net cash flows available to members who were retained in reserves. In (3), g is demonstrated:

$$g = ROE \times r \quad (3)$$

It is important to emphasize that cooperatives offer three ways of investment return to the member: favorable pricing policies, supply of services and distribution of surplus to the member (BIALOSKORSKI NETO, 2007). This paper focus on distribution of surplus as the return analyzed by the cooperative member when allocating their capital to the organization. Therefore, considering the surplus as objective function of cooperatives, ROE can be defined as:

$$ROE = \frac{Surplus}{Average\ Net\ Worth} \quad (4)$$

Also, r in cooperatives can be found by:

$$r = 1 - \left(\frac{Sur_{dist}}{Surplus} \right) \quad (5)$$

Where Sur_{dist} is the surplus distributed and $Surplus$ the surplus before allocations to the reserves, both found in the yearly income statements.

With the absence of shares in the market unlike happens on investor-oriented firms, other changes are required to the initial model in relation to the distribution of dividends and stock price, indicated in equation (2). However, for cooperatives adjustments can be made to estimate the dividend yield. Pederson (1998) proposes to find the dividend yield from the sum of the distribution of surplus (Sur_{dist}) with the equity redemption (Eq_{red}), direct forms of equity payment to the member, divided by the average net worth. Thus:

$$\frac{Div_1}{P_0} = \frac{Sur_{dist} + Eq_{red}}{Average\ Net\ Worth} \quad (6)$$

By substituting (3), (4), (5) and (6) (2) calculation of k_e is given by (2a):

$$k_e = \left[\frac{Surdist + Eqred}{Average Net Worth} \right] + \left(\frac{Surplus}{Average Net Worth} \right) \times \left[1 - \left(\frac{Surdist}{Surplus} \right) \right] \quad (2a)$$

The values of the net surplus and before the allocations are found in the income statements and net worth in the balance sheets. Distributed surplus and return of stock, in turn, are presented in the statements of changes in equity, the cash flow statements, or in the absence of these two statements, it can be seen in the minutes of the assembly meetings.

From the hypothesis presented, based on the literature, it is possible to propose an explanatory quantitative model for the cost of equity in agricultural cooperatives, shown in (7).

$$k_e = \beta_0 + \beta_1 Sta + \beta_2 Size + \beta_3 ROA + \beta_4 CR + \varepsilon \quad (7)$$

In the model, the dependent variable k_e is the cost of equity, β_0 is the constant, Sta is the state in which the cooperative is located, $Size$ is the size in terms of assets, ROA is the return on assets, CR the current ratio, and ε the error term that contains the value of k_e not explained by the variables used.

The state intends to investigate the influence of the cooperative's location in the formation of its cost of equity. Because it is a qualitative variable, it's a dummy with value 0 for São Paulo and 1 for Paraná. The allocation of the value 1 to Paraná is given, as seen in the descriptive statistics of the sample, to the fact that theoretically it is stronger.

To the extent of the size, influence factor in reducing the risk in investors' view, Beaver, Kettler and Scholes (1970) show the use of the company's total assets as a parameter, found in the balance sheet. Also, it guides the transformation to the natural logarithm of assets avoiding distortion and normalizing the sample. Thus, the values that represent the size of the company are found:

$$Size = \ln(Total Assets) \quad (8)$$

The return on assets demonstrates the cooperative's ability to produce surplus from its assets and can serve as a comparison for a member in relation to other investment opportunities. The ROA is calculated from equation (9), and can be found from items of the balance sheet and income statements.

$$ROA = \frac{Surplus}{Total Assets} \quad (9)$$

Current ratio can show how a member cares with the ability to honor the present commitments of a cooperative, for example, the distribution of surplus. From basic information on the balance sheet, it can be estimated by (10):

$$CR = \frac{\text{Current Assets}}{\text{Current Liabilities}} \quad (10)$$

It was necessary, besides the calculation of each of the variables to be used in the model, their individual analysis. For example, it was tested whether it had a normal distribution through a Shapiro-Wilk test. It was detected the absence of normality in four of the model variables. Table 2 contains the results for the normality test.

Table 2 - Results for the Shapiro-Wilk test

Variable	W	V	Z	p-value
k_e	0,83393	19,323	6,713	0,0000
Sta	0,98827	1,365	0,706	0,2401
Size	0,97371	3,059	2,535	0,0056
ROA	0,90407	11,162	5,469	0,0000
CR	0,72644	31,830	7,845	0,0000

H₀: normal distribution
 $\alpha = 0,05$

Source: The authors, using Stata 13.

In order to identify the degree of correlation between variables, to reduce problems such as multicollinearity, a correlation test was performed. To investigate the hypothesis a regression with panel data was performed due to the existence of data and individuals followed over time (GUJARATI, 2005). The most appropriate panel analysis was identified by Chow, Breusch and Pagan, and Hausman tests. As a result, the POLS model was indicated as the most appropriate for the data used, which can be explained by the small number of years in the sample. Additionally, the absence of normality in the sample indicates the correction from a robust regression. Table 3 shows the steps that led to this conclusion.

Table 3 - Tests for evaluating the panel regression model

Chow test - fixed effects versus POLS	
F (74, 71) = 1,16	Prob> F = 0,2616
H ₀ : POLS	H _a : fixed effects
Does not reject the null hypothesis; POLS model.	
Breusch and Pagan test - random effects versus POLS	
$\chi^2 = 0,03$	Prob> $\chi^2 = 0,4344$
H ₀ : POLS	H _a : random effects
Does not reject the null hypothesis; POLS model.	
Hausman test - fixed effects versus random effects	
$\chi^2 = 6,85$	Prob> $\chi^2 = 0,1443$
H ₀ : random effects	H _a : fixed effects
Does not reject the null hypothesis; random effects model.	

Source: the authors, using Stata 13.

Moreover, it was found the variance inflation factor (VIF), to verify the possibility of multicollinearity - where two or more variables are very similar in their explanatory function. VIF shows how the variance inflates by the presence of multicollinearity, with the value 1 representing the complete absence of multicollinearity (GUJARATI, 2005). Finally, to check the problem of heteroscedasticity the White test was made. The heteroscedasticity occurs when the variance of the observations of the sample does not come from normal distributions with constant variance (GUJARATI, 2005). The White test has the existence of homoscedasticity as the null hypothesis, and the alpha utilized was 0,05. All statistical tests were performed on the software Stata 13.

Results and Discussions

Table 4 contains the descriptive statistics for the cost of equity in general and by state. The natural logarithm of the total assets, set to normalize the cooperatives size, has an average of 17,81 with a standard deviation of 2,31. His extreme values are 11,08 and 22,23. As expected, the Paraná values are higher, although because it is an adjustment for natural logarithm it is not as high as the original values.

Table 4 - Descriptive statistics for the cost of equity

Variable	São Paulo	Paraná	General	
k _e (%)	Average	9,12	9,54	9,42
	Median	7,40	7,05	7,14
	Standard deviation	16,95	18,42	17,94
	Minimum	-34,67	-34,52	-34,67
	Maximum	51,82	38,74	51,82

Source: research results using Observatory of Cooperative Organizations data.

The average value of cost of equity for the sample is 9,42%, with a standard deviation of 17,94%. Still, major losses occurred in some cooperatives led to negative values, as the minimum found was -34,67%. The maximum value of 51,82% can be explained by a high profitability relative to the size of the company, or for participating in an industry where this profitability is higher. The median has the value of 7,14%. Segregating the states, it's possible to note the similarity between them due to very similar values found for São Paulo and Paraná.

Table 5 presents the descriptive statistics of quantitative variables used in the empirical model (7).

Table 5 - Descriptive statistics of the quantitative variables used

Variable	São Paulo	Paraná	General	
Size	Average	17,57	17,90	17,81
	Median	17,28	18,53	17,82
	Standard deviation	1,75	2,51	2,31
	Minimum	14,69	11,08	11,08
	Maximum	21,01	22,23	22,23
ROA (%)	Average	2,86	2,60	2,68
	Median	2,52	2,52	2,52
	Standard deviation	4,57	5,55	5,27
	Minimum	-8,39	-13,33	-13,33
	Maximum	15,44	26,96	26,96
CR	Average	1,79	1,43	1,54
	Median	1,37	1,31	1,34
	Standard deviation	1,21	0,57	0,82
	Minimum	0,78	0,51	0,51
	Maximum	7,18	3,88	7,18

Source: research results using Observatory of Cooperative Organizations data.

The average return offered by the cooperative, measured by ROA, is 2,60% with a standard deviation of 5,27%. The minimum value was -13,33%, due to losses in the period, and a maximum of 26,96%. Segregating the states, the average values are close and the value found for the medians are equivalent. The return in the form of surplus offered by São Paulo cooperatives is similar to Paraná's. This could be an indicator for the result of the previous hypothesis tested – even if there is a difference in tradition and economy among the states of the sample, there is not much difference between the return offered by the cooperative.

The average value found for the current ratio of 1,54 with a standard deviation of 0,82, may be demonstrating the concern of cooperatives members with their present commitments, according to the horizon problem much discussed in the literature, as Cook (1995). As a highlight, for the first time in the research the São Paulo numbers are higher than those of Paraná - average 1,79 versus 1,43; median of 1,37 and 1,31 respectively.

Table 6 shows the estimation results and the tests to check the overall significance of the regression, explanatory power, and multicollinearity and heteroscedasticity problems.

Table 6 - Estimation of the results for the model

Results for the estimations of the proposed model						
Variables	POLS		Fixed effects		Random effects	
	Coefficient	p-value	Coefficient	p-value	Coefficient	p-value
Sta	0,0071518	0,702	-	(omitted)	0,0073002	0,686
Size	-0,0111151	0,008***	0,0987373	0,210	0,0110742	0,002***
ROA	3,0075760	0,000***	3,1825470	0,000***	3,0267280	0,000***
CR	-0,0232949	0,025**	-	0,791	0,0229829	0,028**
const	0,2423407	0,004***	-	0,214	0,2405162	0,001***
R ²	0,7351		0,6733		0,6616	
F F □ □ χ ²	59,24***		49,47***		390,1***	
Observations	150					
Average VIF	1,09					
White test	0,366					

Source: research results using Stata 13.

Note: * indicates significance at 10%; ** Indicates significance at 5%; *** Indicates significance at 1%.

The F test indicated the overall significance of the model in 1%, while R² shows that 73,51% of the dependent variable is explained by the variables used, a high value. For all model variables VIF was down close to 1, with an average of 1,09. So, the model does not have multicollinearity problem. As for the White test for homoscedasticity, there was no rejection of the null hypothesis, with p-value of 0,366.

The dummy variable of state, representative of the cooperative's location, showed no significance. Therefore, for this sample, the state is not determining the cost of equity and the hypothesis 1 cannot be accepted. In addition, the fact that it's not decisive in this estimation can also be explained by geographical proximity between the states: although São Paulo present more investment opportunities, it's still a neighboring state of Paraná. Culturally, in general, the producer of both states may be similar. Finally, there is the possibility of the same economic agents are present in both regions.

The size of the cooperative, with a significance of 1%, impact negatively, according to the hypothesis 2 and expected in the literature. The value, however, is very small, and the growth in a unit in the natural logarithm of the asset result in a percentage decrease of 1 in the measurement of ke. It's possible to consider, then, that the person interested sees the company's size as a reduction of risk on your investment, but in an amount without major impact. Still, in perspective this can relate to the matter of the state. Paraná has the largest cooperatives, but the research results indicate that, compared to São Paulo and its smaller cooperatives, this does not interfere with the vision of return that they provide - the cost of equity for Paraná is no greater than for São Paulo. On the company's side, it can be assumed that the cooperatives of Paraná favor the other objective functions that interfere with the formation of surplus in the period, although the median surplus found in the sample do not point to this fact.

Another interesting aspect of the size is a possible relationship with the retained reserves. Cooperatives may have grown based on the retention of surplus, which is the cheapest source of funding in accordance with the Pecking Order Theory (MYERS, 1984). To this is added the data shown in the sample's descriptive statistics, which points to the net worth nearly four times larger than the capital stock. Therefore, it is possible to associate the surplus retentions to the size, and thus to reduce the cost of equity because it's a cheap alternative with lower risks to equity per members' point of view.

The return on assets, significant at 1%, appears as the determinant with greater influence on cost of equity. The marginal increase in ROA leads to an increase of 3,01 in k_e , being positive as expected by hypothesis 3 and literature. Being one of the metrics of return offered to the member, this relates to the concept of equity cost as a function of risk and return expected by the investor. Because it is an organization with high presence of specific assets (LAZZARINI; BIALOSKORSKI NETO; CHADDAD, 1999) the return was expected to be high because it is the compensation for the investment risk.

Unlike exposed with hypothesis 4, the current ratio, with 5% significance, affects the cost of equity negatively. However, as in the case of the size, the influence is small, with a decrease of 0,02 at k_e in each unit over the current ratio. The current ratio demonstrates the ability to meet obligations in the short term, but instead of influencing positively, for example by the current returns to members, as expected from the horizon problem, it can mean reduced risk related to debts with creditors, explaining the negative impact. These debts are identified by Bialoskorski Neto and Marques (1998) as the main external source of financing and are a significant presence in the capital structure of Brazilian cooperatives.

Conclusions

From the traditional problems faced by cooperatives, appointed by Cook (1995), three are related to the ability to invest – free rider, portfolio and horizon. Together with the characteristics of the equity, as the absence of a market and a lack of appreciation, it creates a problem for the member as motivation with paid-in equity in cooperatives, given the importance exerted by this type of organization in the agricultural economic scenario and the producer.

From the bibliographic review, it was possible to develop the assumption that the time issue, linked to the horizon problem, is one of the points observed by the cooperative to allocate equity, because of intention to withdraw benefits linked to this over the long-term investment. For example, the member may prefer to receive services in the present than to have a higher return in the form of surplus distributed in the future. Thus, depending on the chosen objective function as a parameter of return, it would be willing to reduce its cost of equity. This also relates to the results for immediate returns provided by ROA, and the indicators that may show decreased risk for the continuity of the company.

By an adaptation of the Gordon model for dividend growth, proposed by Peder-son (1998), it was possible to estimate the cost of equity for agricultural cooperatives,

representative measure of how much benefits the applicant intends to withdraw from its equity paid-in.

Despite the values found in the descriptive statistics that points to the superiority of Paraná's cooperative, there was no significance for the dummy representative of the sample's states. In other words, considering Paraná and São Paulo, this does not seem to influence the formation of the cost of equity. The less competition found in Paraná can serve as a justification for this. Other possibilities point to the geographical and cultural proximity of both states.

The regression using panel data allowed the visualization of ROA as the main determinant of the cost of equity, because it represents the return offered to the cooperative member. The member sees in the present the main benefits of a cooperative, without worrying with expectations beyond the moment. In perspective with the results to the location of the cooperative, further research may investigate the formation of returns per region where the cooperative is present.

The variable of current ratio presented negatively, unlike expected the hypothesis. The evaluation of the current ratio allows analysis of the horizon problem, because it is an indicator for the existent situation of the institution. Furthermore, for cooperatives, the peculiarity of the owner asks for a more detailed analysis of the role of liquidity, which may have specific influence on this type of organization. High liquidity may mean ensuring higher returns, while guarantees to creditors.

With these results exposed, it is always important for agricultural cooperatives to resume their different possible objective functions. Serving for the increase of its member welfare, it usually offers benefits of favorable prices, services and distribution of surplus. So, that it could be applied finance adjustments to this research, it was up to use the perspective of the cooperative as a generator of surplus to its members, this being a limitation. The advancement of the study of cost of equity to cooperatives would involve the insertion of indicators of returns as to other sources of benefits offered to the member, adapting even more the models very unexploited in the literature to this date. In addition, a member can be benefited indirectly, making it difficult to measure. The mere presence of a cooperative in a market, for example, can position as guidance of prices for the sector in which it operates.

To the progress of this research, it is recommended to use control variables that can improve the model used. Also, if possible, increasing the sample, including the possibility of more cooperatives, other states and years, it would help in the use of panel data and could provide better results regarding the influence of location on the formation of cost of equity. The lack of normal distribution of four of the variables used could still require additional analysis using non-parametric inference techniques.

Even so, this work can be considered as the beginning of the research agenda in an area of finance still little explored for cooperatives. The unfolding of visualization of what the member considers return would be of great value not only for research but also for managers and policy makers. Also, understanding of the whole decision making process for a person to be bound to a cooperative, or just decide to allocate more of their capital, would mean developing resolutions to the financing problem and management in this type of company, creating appropriate mechanisms to reduce the problems linked to vaguely defined property rights and due to the lack of monitoring by the

members (COOK, 1995). Thus, the cooperative as a whole, could benefit from guidelines that would make them stronger and with a long-term survival.

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Received: 08/19/2016

Approved: 11/17/2016