BBR
BRAZILIAN BUSINESS REVIEW

ARTICLE

Transformations in the Ownership Structure of Credit Unions: Banking Service Rates and the Expectations of Members and Directors

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ABSTRACT

Open membership and mergers are common transformations in the ownership structure in Brazilian credit unions. Following the logic that they are motivated by the expectations of members and directors, this study associates these transformations with the banking services rates offered by credit unions. We employ ordered and multinomial logit models to investigate whether abnormal positive bank spreads—reflecting rates that could offer few advantages to members and large private benefits to directors—increase the probability of transformation. Our results indicate that the expectations of members and directors explain credit unions' transformation, as seen in size and performance. The evidence reinforces that, under expectations of gains, members and directors play an active role in the decision to transform the ownership structure of credit unions, suggesting improvements in the corporate governance and incentives for mergers so that credit unions can grow to benefit members.

KEYWORDS

Credit Unions, Ownership Structure, Open Membership, Mergers

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Received: 09/10/2021.
Revised: 12/07/2021.
Accepted: 12/29/2022.
Published Online: 09/15/2022.
DOI: http://dx.doi.org/10.15728/bbr.2022.19.6.2.en

1. INTRODUCTION

Credit unions transform their ownership structures even if their shares are not negotiable (McKillop et al., 2020). Transformations in Brazil have become common ever since legislation permitted open membership by allowing the removal of the occupational requisites for association from the bylaws. In the 15 years since they were granted permission to adopt open membership, from 2003 to 2018, 809 credit unions have chosen to do so, dispersing their ownership, or have merged into another, transferring their ownership structure. As a result, credit unions have entered new markets and services, leveraging the scale of the sector (Banco Central do Brasil, 2019). Understanding the motives for taking these transformation decisions, therefore, is crucial for designing policies which help credit unions deal with their growing operational complexity.

Thus, the objective of this work is to associate decisions to adopt open membership or merge into another credit union with the banking services rates practiced by Brazilian credit unions. In this work, these rates reflect the expectations of the members and directors for the benefits they will gain through these transformations. Members are motivated by the opportunity to access better rates for banking services, which is the same reason they have joined a credit union (Hart & Moore, 1996, 1998). Open membership, on the other hand, lets directors increase their private benefits in terms of the security of their positions, status and larger remuneration, which, in turn, are lost if their credit union merges into another (Nan et al., 2019; D'Souza & Nash, 2017; Gorton & Schmid, 1999).

In this manner, this work assumes that members and directors have control over the decisions to transform the ownership structure, distinguishing itself from previous studies which considered them passive participants. To these studies, transformations (specifically, mergers) took place in small credit unions, with poor performance, which did not survive in their markets (Goddard et al., 2014; Worthington, 2004; Thompson, 1997), and their members and directors were restricted to accepting the decisions of other larger credit unions or regulatory bodies. These studies do not consider that members and directors could have taken decisions about the ownership structure seeking their gains, as occurs in for-profit organizations (Reiff & Tykvová, 2021; Ewens & Farre-Mensa, 2020; Fidrmuc & Xia, 2019).

To accomplish our objective, we have employed ordered and multinomial logit models to investigate whether positive values for abnormal bank spreads, measured by rates of little advantage to members, increase the probability of transformations, and whether larger abnormal bank spreads are associated with open membership, reflecting the propensity of directors to seek private benefits. Our results support these hypotheses, indicating that rates of little advantage motivate ownership structure transformations in credit unions and that adopting open membership occurs with less advantageous rates than those operationalized by the merged.

These results are important because they indicate that transformations in the ownership structure of credit unions do not occur by chance and do not depend solely on external factors. They were determined by, and reflected by, the expectations of the members and directors. These results are distinct from studies such as Bauer et al. (2009) because they treat the decision-making behind transformations, rather than the impacts. The results also have implications for regulatory bodies because they suggest the need for measures to contain the seeking of private benefits by directors who adopt open membership and policies to encourage mergers. Both have important implications in making sure that the credit union sector grows, generating benefits for its members.

2. TRANSFORMATIONS IN THE OWNERSHIP STRUCTURE OF BRAZILIAN CREDIT UNIONS

Credit unions are financial institutions regulated by the cooperative law and the Central Bank of Brazil, which intermediates deposits and loans among members (Pinheiro, 2008; Lei nº 5764, 1971). Members find and join credit unions to access better banking services rates than those found in commercial banks. Since they are owners of the credit union, members have the right to vote in assemblies about important organizational issues, such as the election of directors, mergers, and alterations in bylaws (Rubin et al., 2013). Voting is a form of exercising formal authority of their residual rights of control as owners. Directors, in turn, have control over everyday activities such as banking services (Hart & Moore, 1990; Grossman & Hart, 1986; Rasmusen, 1988).

Individuals can become members of a credit union if they fulfill the socioeconomic requirements and acquire the minimum number of shares stipulated in its bylaw. The membership requirements limit the ownership dispersion which grows with the addition of new members (Rubin et al., 2013; Leggett & Strand, 2002). Historically, the Central Bank has required credit unions to establish occupational and geographical bonds among their members, but, in 2003, it allowed the practice of open membership, removing the occupational bond (Pinheiro, 2008; Resolução nº 3106, 2003).

Regulatory changes, such as open membership, generate opportunities and have preceded transformations in credit unions. Waves of mergers occurred in the United States, Australia, New Zealand, Spain, and the United Kingdom after credit unions were allowed to enter new markets and services (McAlevey et al., 2010; Worthington, 2004; Goddard et al., 2002; Thompson, 1997; Grifell-Tatjé & Lovell, 1996; Ingham & Thompson, 1995). In Brazil, 132 credit unions adopted open membership between 2003 and 2007, the first few years it was permitted, with 46 mergers and 100 liquidations taking place during this period. Between 2008 and 2018, when 267 adopted open membership, there were 364 mergers, and liquidations fell to 56 cases. In the 15 years before open membership, just 37 were merged and 330 were liquidated.[1] There was a change in the prospects of the future of credit unions, which before were restricted to maintaining the same operations until their liquidation.

The adoption of open membership, or being merged by another credit union, transform the ownership structure. In this work, transformations in the ownership structure are those in which the members continue to be owners but under different terms. For example, mergers, split-offs, and initial public offerings transform the ownership structure of listed companies because they mix, concentrate, or dilute the investors' ownership. Members do not cease to be owners as happens in liquidations and there is no change in the type of cooperative ownership as occurs in demutualization. Even if mergers close the target credit union, the members become owners of the acquiring (Josephy et al., 2017). Open membership, which alters the credit union's bylaw, mergers, and split-offs depend on member approval (Pinheiro, 2008; Resolução nº 3106, 2003; Lei nº 5764, 1971).

Each transformation in the ownership structure has its own effect on credit unions. Open membership makes any resident of the credit union's region a possible new member, dispersing ownership and increasing scale without directly causing other changes. A merger transfers assets, debts, and net assets from the target to the acquirer. The ownership structure is also transferred with the members of the target joining those of the acquirer. Even if the directors of the target receive functions within the acquirer, their positions will be lower in rank. The directors of the

acquirer get control over the activities of the target. Split-offs divide one credit union into smaller credit unions. The members and directors are distributed among the credit unions, concentrating the ownership dispersion (Tirole, 2006; Manne, 1965).

3. BANKING SERVICES RATES AND TRANSFORMATIONS IN THE OWNERSHIP STRUCTURE OF CREDIT UNIONS

Regulatory changes precede but do not determine which credit unions will transform their ownership structure. There has been little investigation of the motives for these decisions. Previous studies have assumed the logic of for-profit listed companies in which small credit unions with poor performance cannot survive in their markets and are merged into another or liquidated (Carvalho et al., 2015; Bressan et al., 2011; Goddard et al., 2009, 2014; Worthington, 2004; Thompson, 1997). Although important, these factors by themselves do not seem to motivate transformations because credit unions with these characteristics have always existed, but mergers have only become frequent since these regulatory changes. The only particularity of the credit unions investigated is the same requirement for association in the acquirer and the target (Worthington, 2004).

This work associates the ownership structure transformations of credit unions with the expectations of those who control them. The logic is based on regulatory changes creating new prospects for members and directors, and proposals by Bebchuk (1999) and Zingales (1995) regarding for-profit companies, which suggested expectations of gains determining investors' decisions about the ownership of the companies that they have founded. They weigh their expectations regarding the return on the sale of shares versus the private benefits enjoyed by maintaining majority control. The package which maximizes their benefits determines how they negotiate ownership and how much control they retain. Reiff and Tykvová (2021), Ewens and Farre-Mensa (2020), Fidrmuc and Xia (2019) and Masulis and Simsir (2018) offer evidence for this logic for public offerings and takeovers.

For credit unions, we need to understand the expectations of their members, who are owners, and directors, assuming executive functions. Studies on the consequences of mergers have suggestions. They identify gains for the members of the target, who have access to better banking services rates, but identify few or no operational gains for the acquirer, even though they have increased their scale and become more robust financially (Wilcox & Dopico, 2011; Bauer et al., 2009; Wilcox, 2005; Ralston et al., 2001; Fried et al., 1999; Garden & Ralston, 1999).

The suggestion of more advantageous banking services rates for members is related to the motive for founding and joining a credit union. Members seek advantageous rates because they are owners with residual rights of control over the credit union (Rubin et al., 2013; Hart & Moore, 1990; Grossman & Hart, 1986). Since each member has just one vote, decisions made in assemblies reflect the individual expectations of most of them (Hart & Moore, 1996), and since their benefits are due to transactions with the credit union, it is natural that they make decisions based on their transactions. Thus, the decision-making by the members in assemblies reflects their expectations regarding the rates operationalized by the credit union (Hart & Moore, 1998). Legislation preserves their right to decide about transformations through vote (Resolução nº 3106, 2003; Lei nº 5764, 1971). Therefore, it is possible that the expectation of access to better banking services rates is a determinant of the ownership structure transformations. If this were not the case, members would not have an incentive to approve it.

However, members exhibit free-rider behavior due to the small investment made for association, and it is improbable that they propose transformations in the ownership structure. They limit themselves to approving or rejecting the proposals of the directors (Gorton & Schmid, 1999; Rasmusen, 1988) who, in turn, have distinct expectations in terms of open membership or being merged by another credit union. Here, even though regulatory bodies have an influence on a proposal, they may be assumed to be indifferent in terms of transformations, because both generate larger andfinancially robust credit unions (Bauer et al., 2009).

There are incentives for the directors to adopt open membership. Increases in scale are associated with greater remuneration and margin for shirking due to job security, given that larger credit unions are more protected by regulatory bodies and generate status for electoral purposes (Nan et al., 2019; D'Souza & Nash, 2017; Jensen, 1986). Free-rider behavior of the members also grows with ownership dispersion, creating more margin for managerial opportunism (Gorton & Schmid, 1999; Bebchuk, 1999). On the other hand, directors of the target credit unions lose their jobs, and even if they are relocated in some position in the acquirer, they lose their status (Tirole, 2006; Manne, 1965). Therefore, the greater the consumption of private benefits by directors, the more likely they are to propose open membership and the greater their resistance against a merger by another credit union.

In seeking private benefits, directors diminish the benefits generated for the owners (Bebchuk, 1999; Jensen & Meckling, 1976). Thus, banking services rates become less advantageous to members, who have greater expectations of improvements through an ownership structure transformation. However, rates that are not very advantageous can also reflect poor managerial ability, with their being more related to poor financial performance than the private benefits of directors (Carvalho et al., 2015). This may be the case of the target credit unions, whose poor financial performance is always emphasized (Worthington, 2004; Thompson, 1997). Perhaps their directors were less resistant to a merger influenced by regulatory bodies because their private benefits were smaller than those who adopted open membership. Therefore, it is possible that open membership associates with less advantageous banking services rates compared with the rates of the credit unions merged into another due to a greater propensity of directors to seek private benefits. Thus, the less advantageous the rates are, the greater the probability open membership has been proposed and approved by the members.

4. METHODOLOGY

4.1. Sample and data

This work uses a sample of 1,376 first-level credit unions, investigating ownership structure transformations from 2008 to 2018. They are all the credit unions which were active during this period, except those founded after open membership was permitted in 2003. Since they were founded before open membership was permitted, and the resulting wave of mergers, the characteristics of the members and directors were formed when there were no expectations of benefits generated by their transformation. The regulatory change generated new expectations on consolidated profiles of members and directors. This minimizes possible biases of credit unions founded with the expectation of transformation. Analyzing transformations between 2008 and 2018 also avoids possible bias to open membership during the years 2003 to 2007, when mergers still were not common in Brazil. Those liquidated after 2008 were maintained because they existed together with the other.

Each credit union is represented by one observation. For the 20 that merged into another after adopting open membership, only open membership was considered to avoid double-counting. Open membership was identified using the Central Bank's Financial Institution Report and mergers using the National Register of Legal Entities. In addition to the date of the transformation, these databases contain affiliations with credit union systems, the date of founding, and number of branches. The financial data comes from balance sheets made available by the Central Bank, being adjusted for inflation in 2019 using the IGP-M index. Even though this work investigates transformations between 2008 and 2018, we collected data for other variables, described in the next subsections, beginning in 2003 to represent credit unions since the advent of open membership.

4.2. Econometric model and variables

Multinomial models are used when there are two or more alternatives in a decision (Cameron & Trivedi, 2005). This is the case for decisions to not transform a credit union's ownership structure ($j = 0$), to be merged into another ($j = 1$) or to adopt open membership ($j = 2$). We expect that banking services rates will be decreasingly advantageous as j increases. Split-offs were not considered for j due to their low frequency (4 cases), and liquidations were not considered transformations because the members ceased to be owners. The basic econometric model is displayed in (1).

$$y_i^* = \beta_0 + \beta_1 \overline{spread_i^*} + \gamma_1' X_i^* + \gamma_2' Z_i + \theta_i + \varepsilon_i \tag{1}$$

Where y^* is an estimated latent value for credit union i inserted into a multinomial density function $f(Y)$ constructed based on p probabilities of decisions represented by j alternatives for the ownership structure transformation. The measure of banking services rates is represented by $\overline{spread_i^*}$, and X^*, Z and θ are groups of controls suggested by the literature. All these variables are described in the next subsections. $f(Y)$ is represented by (1.1):

$$f(Y) = \prod_{j=0}^{2} p_j \tag{1.1}$$

$f(Y)$ is the product of the probabilities $p_j = \Pr(Y = j)$ of a decision j about transformations in ownership structure. Not transforming is represented by $Y_{i0} = 1\,(j = 0)$; being merged by another credit union is $Y_{i1} = 1\,(j = 1)$; and adopting open membership is $Y_{i2} = 1\,(j = 2)$. Y_{i0} is the reserve alternative on which the other alternatives are based. Under Y_{i0}, the other possible decisions do not generate expectations of access to better banking services rates for members.

$f(Y)$ makes it possible to estimate (1) by ordered and multinomial logit regressions. The ordered logit estimates a regression assuming $j - 1$ bounds α within $f(Y)$ separating j, thus, the independent variables increase or decrease the probability of the approval of a major transformation ($Y_{i2} = 1 > Y_{i1} = 1$). This allows us to investigate whether the adoption of open membership is associated with banking services rates which are less advantageous than those operationalized by the credit unions that merged into another, given the propensity of directors to seek private benefits. The multinomial logit, meanwhile, estimates $j - 1$ regressions without ordering the js, that is, regressions where independent variables increase or decrease the probability of adopting

open membership ($Y_{i2} = 1$) or being merged ($Y_{i1} = 1$). The Y_{i0} coefficients are restricted to zero, indicating a decision made among various alternatives and not several decisions between two alternatives which would be the case of a binary logit regressions set (Cameron & Trivedi, 2005).

This work's analyses are based on the results of the ordered logit estimation due to the proposed order among ownership structure transformation decisions. The results of the multinomial logit estimation are supplementary. Cameron and Trivedi (2005) point out some assumptions that are necessary to ensure the validity of these results. The *j* decisions should take place under the same assumptions concerning non-observable factors, which were controlled for in the sample selection described previously. The *j* decisions should also be mutually exclusive; thus, a credit union cannot adopt open membership at the same time as it is merged. This, of course, is not possible because the targets cease to operate. Last of all, multinomial models are sensitive to irrelevant alternatives, in which it would be indifferent adopting open membership or being merged. The relevance of each *j* was verified by Wald tests. In the ordered logit regression, we tested the statistical equality between the α bounds. The rejection of the null hypothesis indicates that the α bounds do not overlap, distinguishing α and suggesting an order among the *j* values. In the multinomial logit regression, we checked the equality statistic among the obtained groups of $B_{(1)}$ and $B_{(2)}$ coefficients, respectively, in the regressions for Y_{i1} and Y_{i2}. The rejection of the null hypothesis indicates the difference between $B_{(1)}$ and $B_{(2)}$, suggesting that the *j* decisions are distinct and relevant.

4.2.1. Banking services rates

The banking services rates were estimated as the credit union's bank spread. The spread is the difference between the average interest rates charged on loans and the average interest rate remuneration on deposits. To be advantageous, the loan rates should be low, and the deposit rates should be high. Thus, the lower the spread, the better the rates which are available to members (Rubin et al., 2013). The spread is expressed in (2):

$$spread_{it} = \frac{r\_oc_{it}}{oc_{it}} - \frac{d\_cap_{it}}{dep_{it}} \quad (2)$$

The average bank spread operationalized by credit union *i* in semester *t* is represented by the revenues from credit operations (*r_co*) divided by total credit operations (*co*) minus fundraising expenses (*f_exp*) divided by total deposits (*dep*).

In (1), we use the average abnormal bank spread ($\overline{spread_i^*}$) of credit union *i* between the first semester of 2003 and semester *t* when the ownership structure was transformed (the second semester of 2018 when $j = 0$). The abnormal spread is how much of the spread cannot be explained by organizational characteristics, because credit unions of different sizes, operations, and regions naturally operate with distinct spreads. With the abnormal spread it is possible to suggest how much unsatisfied members expect that the rates practiced by their credit union will be better. The abnormal spread also indirectly reflects the private benefits of the directors which make the credit union rates less advantageous to the members (Jensen & Meckling, 1976). D'Souza and Nash (2017) indicate that indirect measures of private benefits, such as the abnormal spread, estimate the effect of the consumption of perks, such as abnormal high remunerations, and shirking over the organization's production.

In this work, the abnormal spread is the error term of an ordinary least squares regression (OLS) stacking observations from all the semesters of the credit unions in the sample, where the spread given by (2) is a function of the production determinants pointed by Brickley et al. (2015). The error term is the difference between the operationalized spread and the spread expected from the regression. Since the distribution of the error terms have an average of zero, positive values indicate operationalized spreads greater than expected. Positive values for the abnormal spread increase the probability of transformation because they suggest an expectation of better banking services rates on the part of members. Larger abnormal spreads reflect directors who have a propensity to consume private benefits, increasing the probability of the adoption of open membership. The abnormal spread is expressed in (3):

$$spread^{*}_{it} = e_{it} = spread_{it} - b'H_{it} \quad (3)$$

In which $spread^{*}$ is the abnormal bank spread of credit union i in semester t, which is the error term e for i at t from an OLS regression with the spread given by (2) being a function of a set of determinants H. b is the set of regression coefficients. H includes a product benchmark (the median of the operationalized spread by credit unions' with the same main banking service as i at t), and size (the natural logarithms of total assets and the number of branches). H also has dummies to control for the fixed effects of banking operations which i is permitted to perform and the economy of the state where i has its headquarters. The use of averages in (1) suggests that credit unions that have high abnormal spreads with greater frequency transformed their ownership structure.[2]

4.2.2. Controls

X^{*} contains financial indicators from PEARLS[3] identified by Bressan et al. (2011) as determinants of insolvency for credit unions. All of them are important to control for poor performance due to the little managerial ability expected in the credit unions merged into another. P2 is the protection against risk, which is given by past due credit operations divided by all credit operations. E1, E3, and E4 represent the effective financial structure, being the proportions of net credit operations, share capital and reserves, respectively, to the credit union's total assets. A3 indicates the quality of the assets, being the proportion of the assets, which are not related to the production of banking services compared to the total assets. R5, R6, and R11 control rates of return and expenses, being, respectively, the gross margin divided by total assets, operational expenses divided by total assets, and revenues from providing services divided by administrative expenses. The asterisk in X^{*} indicates that, as with the spread in (1), we used the average error terms from regressions for each one of these indicators as a function of the same H group of controls as in (3). This was done to remove the influence of other possible factors in terms of performance, estimating the ability of the directors.

Z controls the organizational characteristics of the credit unions. We used the average natural logarithms of the assets, and the number of branches, to represent the size, which is determinant for its longevity or whether it is merged by another credit union (Goddard et al., 2009, 2014; Worthington, 2004; Thompson, 1997). Z also contains the average natural logarithms for the credit union's age (in semesters), because older credit unions can adopt open membership to expand their operations or be too consolidated to be a target in a merger. θ controls for fixed effects. A dummy variable identifies whether the credit union is categorized as capital and loan, with lower risk in their payroll loans influencing their interest rates as well as their financial performance.

A set of dummy variables that identify the state where the credit union is headquartered controls for the influence of the regional economy and competition. Last of all, a set of dummy variables identifies the credit union system with which it is associated, whose importance has to do with the regulatory influence of decisions regarding affiliates.

4.2.3. Descriptive statistics

Table 1 contains descriptive statistics of the variables used in (1) for the overall sample and for the *j* decision groups in terms of transformations. For continuous variables we present averages (standard deviations), while for fixed effect controls we present modes (percentages). In Table 1, $\overline{spread}^{*}$ and X^{*} controls are percentages and Z controls are not in natural logarithms to facilitate their description, even though it should be emphasized that they were not used this way in (1). Increases ([+]) or reductions ([–]) in the risk of insolvency identified by Bressan et al. (2011) accompany X^{*} controls.

The less advantageous banking services rates are in the group that adopted open membership (an average abnormal bank spread of 0.511 versus 0.122 for the sample overall), with the group that did not transform their ownership structures, operating with lower-than-expected spreads (an average of -0.106). Credit unions merged into another had the worst average performance in four of the eight X^{*} indicators (E1 [0.275], E3 [-8.351], A3 [1.330] and R5 [0.291]), being worse than those that did not transform in one indicator (P2 [2.332]). Since the average abnormal spread of the target credit unions (0.409) was smaller than the average for those who adopted open membership despite their poor performance, this may suggest the poor managerial ability of their directors. This also reinforces the idea that directors who adopt open membership have a propensity to seek private benefits, given that the abnormal spread is not necessarily due to poor performance.

The largest credit unions are those which have adopted open membership (with averages of R$ 91.0 million in total assets and 3.1 branches). The merged into another are small and young compared to the others (averages of R$ 20.1 million in total assets and 1.6 branches; around 22 semesters in operation), which aligns with Goddard et al. (2009, 2014). Credit unions that did not transform were old (35.6 semesters) and often large (demonstrated by standard deviations of R$ 174.8 million in total assets and an average of 4.6 branches). They are consolidated credit unions whose members may did not have reason to transform the ownership structure. The modes in São Paulo, Minas Gerais, and Sicoob reflect the states and system with most credit unions, and it is relevant to highlight the tendency for mergers within Cresol.

5. RESULTS AND DISCUSSION

The results of the ordered logit and multinomial estimations for (1) are displayed in Table 2. Below the coefficients between parentheses are the respective standard errors.

The rejection of the null hypothesis in the likelihood ratio tests, of independent variables without effect, validates (1) ($\chi^2_{[43]}$ = 541.06, p-value<0.01, for the Ordered Logit [1] and $\chi^2_{[86]}$ = 914.15, p-value<0.01 for the Multinomial Logits [2.1] and [2.2]). Ordered Logit (1) correctly forecasted 65.99% of the transformations and the Multinomial Logits (2.1) and (2.2) correctly forecasted 70.93%. Both percentages are like the ordered and multinomial logit of Ingham and Thompson (1995) for inter-cooperations after regulatory changes in the United Kingdom (64.6% and 70.2%, respectively). Finally, the *j* alternatives are relevant because the Wald test rejected equality among the groups of B coefficients ($\chi^2_{[43]}$ = 192.37, p-value<0.01).

Table 1
Descriptive statistics

Variables	Sample j = {0, 1, 2}	Not Transformed j = 0	Merged into Another j = 1	Open Membership j = 2
Spread* (%)	0.122	-0.106	0.409	0.511
	(3.510)	(3.676)	(3.562)	(2.778)
P2* (%) [+]	0.600	-0.743	2.332	2.852
	(15.355)	(14.275)	(15.590)	(17.818)
E1* (%) [+]	-0.469	-0.449	0.275	-1.420
	(14.469)	(16.044)	(13.063)	(10.012)
E3* (%) [–]	-1.223	2.475	-8.351	-4.615
	(16.968)	(18.648)	(13.941)	(9,629)
E4* (%) [–]	0.078	-0.412	1.208	0.308
	(10.461)	(12.304)	(8.249)	(4.718)
A3* (%) [+]	0.028	0.623	-1.330	-0.268
	(5.852)	(7.181)	(3.227)	(1.933)
R5* (%) [+]	-0.009	-0.179	0.291	0.181
	(2.702)	(3.084)	(2.349)	(1.458)
R6* (%) [+]	0.001	0.075	-0.367	0.201
	(6.502)	(7.255)	(6.312)	(3.457)
R11* (%) [–]	0.595	-0.836	2.804	2.563
	(10.472)	(10.092)	(10.833)	(10.501)
Assets (thsd R$)	64,367.63	72,443.34	20,142.59	91,011.80
	(175,965.73)	(174,780.44)	(38,049.74)	(253,738.28)
Branches	2.531	2.675	1.658	3.108
	(4.038)	(4.568)	(1.555)	(4.116)
Age (semesters)	30.898	35.564	21.961	26.550
	(20.289)	(21.672)	(15.762)	(15.426)
Capital and loan	No	No	No	No
	(81.03%)	(71.52%)	(90.76%)	(100.00%)
State	São Paulo	São Paulo	São Paulo	Minas Gerais
	(22.31%)	(27.75%)	(18.15%)	(23.92%)
Credit Union System	Sicoob	Sicoob	Cresol	Sicoob
	(39.32%)	(36.80%)	(24.09%)	(67.45%)
Credit Unions	1,376	818	303	255

Source: The Authors.

The coefficients for the abnormal bank spreads were positive and significant in all the estimations (5.471 for the Ordered Logit [1] and 7.462 and 13.707 for the Multinomial Logits [2.1] and [2.2], p-values<0.05), indicating that banking services rates that are of little advantage to members increase the probability of ownership transformation. The evidence in Table 2 demonstrates that the expectations of members for better rates was as determinant of transformations in credit unions as poor performance and size cited by works such as Goddard et al. (2009, 2014),

Worthington (2004) and Thompson (1997). The results of Multinomial Logit (2.1) and (2.2) stand out, because even though the effects of adopting open membership or being merged are very distinct for the directors, the authority of the members dominated. As Hart and Moore argue (1996, 1998), the decisions of the members are based on the prices of the services at their disposal, thus decisions to access better rates were approved despite possible resistance from the directors. Finally, this evidence adds to works such as Wilcox and Dopico (2011) and Bauer et al. (2009) by suggesting that the members of the target credit unions would are already expecting improved banking service rates when they approve mergers in assemblies.

Table 2
Results of the ordered and multinomial logit estimations

	Ordered Logit (1)	Multinomial Logit (2.1)	Multinomial Logit (2.2)
	Merged into Another and Open Membership	Merged into Another	Open Membership
	$j = 1$ and $j = 2$	$j = 1$	$j = 2$
$\overline{spread}^*$	5.471**	7.462**	13.707**
	(2.655)	(3.106)	(5.393)
$\overline{P2}^*$	0.379	0.625	-0.449
	(0.425)	(0.597)	(0.637)
$\overline{E1}^*$	1.693***	3.019***	3.227***
	(0.608)	(0.772)	(1.197)
$\overline{E3}^*$	-4.437***	-4.741***	-8.222***
	(0.591)	(0.783)	(1.238)
$\overline{E4}^*$	-3.036***	-3.569***	-3.456
	(1.090)	(1.266)	(2.841)
$\overline{A3}^*$	-5.137**	-7.433***	-6.115
	(2.008)	(2.189)	(6.190)
$\overline{R5}^*$	9.091*	7.190	35.311***
	(5.072)	(5.941)	(12.178)
$\overline{R6}^*$	0.570	-0.868	0.344
	(2.136)	(2.566)	(4.455)
$\overline{R11}^*$	-0.195	2.080**	-1.583
	(0.696)	(0.954)	(1.153)
nl(Total Assets)	0.252***	0.050	1.087***
	(0.065)	(0.080)	(0.169)
nl(Branches)	-0.869***	-1.341***	-1.722***
	(0.174)	(0.276)	(0.282)

Table 2
Cont.

	Ordered Logit (1)	Multinomial Logit (2.1)	Multinomial Logit (2.2)
	Merged into Another and Open Membership	Merged into Another	Open Membership
nl(Age)	-0.122	-0.208	-0.278
	(0.127)	(0.166)	(0.230)
Capital and Loan (dummy)	-1.225***	-1.128***	-16.886
	(0.275)	(0.326)	(829.292)
State (dummies)	Yes	Yes	Yes
Credit Union System (dummies)	Yes	Yes	Yes
α Bound (j = 1)	2.103**		
	(1.059)		
α Bound (j = 2)	3.598***		
	(1.062)		
Constant		-0.893	-15.008***
		(1.370)	(2.673)
Observations	1,376	1,376	1,376
Percentage of correct forecasts	65.99%	70.93%	
Likelihood Ratio ($\chi^2_{[d.f.]}$)	541.06***	914.15***	
	[43]	[86]	
α (j = 1) = α (j = 2) ($\chi^2_{[d.f.]}$)	360.39***		
	[1]		
$B_{(1)} = B_{(2)}$ ($\chi^2_{[d.f.]}$)		192.37***	
		[43]	

Note. Standard errors are below the coefficients and degrees of freedom (d.f.) are below the χ^2. The likelihood ratio and Wald tests, in addition to the correct forecast percentages, refer to both Multinomial Logit (2.1) and (2.2). $B_{(1)}$ and $B_{(2)}$ are groups of from Multinomial Logit (2.1) and (2.2).

*** p<0.01, ** p<0.05, * p<0.10

Source: The Authors.

The α bounds are significant (2.103 with a p-value<0.05 for the targets [j = 1] and 3.598 with a p-value<0.01 for those who adopted open membership [j = 2]) and the Wald test indicates that they do not overlap ($\chi^2_{[1]}$ = 360.39, p-value<0.01). With the existence of an order among the j alternatives, it is possible to investigate the association between larger abnormal bank spreads and the probability of adopting open membership. Table 3 contains the marginal effects of abnormal spreads and X^* controls with significance in Ordered Logit (1). The standard errors of the marginal effects, obtained through the delta method, appear within the parentheses.

The marginal effects show how the banking services rates determine ownership structure transformations in credit unions. Controlling by the averages (or modes for the fixed effect controls) of the other variables of (1), a unit increase in the abnormal bank spread reduces the

probability of not having transformations by roughly 90.7% (-0.907, p-value<0.05). Even though the abnormal spread varied only between -0.153 and 0.133, the reduction of the probability of there being no transformation is considerable.

The main result of Table 3 is the marginal effect of a unit increase in the abnormal bank spread on the probability of the adoption of open membership, which is more than double the marginal effect regarding of being a target in a merger (0.660 versus 0.248, p-values<0.05). Therefore, the less advantageous the banking services rates are for members, the greater the probability that there will be a major transformation of the ownership structure. Since the statistics in Table 1 indicate that credit unions which adopt open membership have better performance than those which are merged into another, this abnormal spread must be largely due to the discretion of the directors. Since there are incentives to seek private benefits (Gorton & Schmid, 1999), we can infer that the directors proposed open membership with the expectation that this would increase their private benefits. The members, in turn, approved open membership with the expectation of a great improvement in the banking service rates, which had thus far been of little advantage to them due to the private benefits for the directors (Jensen & Meckling, 1976). Mergers seem to depend on the influence of regulatory bodies concerned about the robustness of the sector due to poor performance (Bauer et al., 2009).

Table 3

Marginal effects ($\delta Pr[Y = j] / \delta x_i$) of selected variables in the Ordered Logit (1)

	Not Transformed	Merged into Another	Open Membership
	$j = 0$	$j = 1$	$j = 2$
$\overline{spread}^*$	-0.907**	0.248**	0.660**
	(0.439)	(0.123)	(0.319)
$\overline{E1}^*$	-0.281***	0.077***	0.204***
	(0.100)	(0.284)	(0.073)
$\overline{E3}^*$	0.737***	-0.201***	-0.535***
	(0.100)	(0.030)	(0.071)
$\overline{E4}^*$	0.504***	-0.138***	-0.366***
	(0.179)	(0.050)	(0.131)
$\overline{A3}^*$	0.853**	-0.233**	-0.620**
	(0.331)	(0.092)	(0.243)
$\overline{R5}^*$	1.510*	0.413*	1.097*
	(0.839)	(0.231)	(0.612)

Note. Below the marginal effects are standard errors obtained through delta method. P2, R6 and R11 did not present significance in Ordered Logit (1). We used the means of nl(Total Assets), nl(Branches) and nl(Age), and the modes of Capital and Loan (No), State (São Paulo) and System (Sicoob), as controls.

*** p<0.01, ** p<0.05, * p<0.10

Source: The Authors.

5.1. Robustness of the results

Two estimations of (1) were performed to check the robustness of the results. A logit regression using just credit unions which transformed their ownership structure, with open membership as the alternative to being merged by another credit union ($Y_i = 1[j = 2]$), verified an increase in the probability of a major transformation ($Y_{i2} = 1 > Y_{i1} = 1$) due to higher abnormal bank spreads. Another logit regression used transformation cases as a dependent variable without distinguishing between them ($Y_i = 1[j = \{1, 2\}]$) to attest to the effect of the abnormal bank spread on the probability of transformation. The results are displayed in Table 4.

Both estimations indicate a positive association between the abnormal bank spread and the probability of a transformation in the ownership structure (20.647 in Logit [3] and 6.490 in Logit [4], p-value<0.05), converging with the previous results. It should be noted that the abnormal bank spread remained significant in Logit (3), while many controls were no longer significant. This reinforces the importance of banking service rates in the transformation decision and the existence of an order between open membership and being acquired.

Table 4
Results of the logit estimations for robustness

	Logit (3)	Logit (4)
	Open Membership versus Merged into Another j = 2 in relation to j = 1	Transformations j = {1, 2}
$\overline{spread}^*$	20.647**	6.490**
	(8.701)	(2.877)
$\overline{P2}^*$	-0.935	0.194
	(1.069)	(0.479)
$\overline{E1}^*$	1.551	2.356***
	(2.115)	(0.670)
$\overline{E3}^*$	-1.341	-5.218***
	(2.022)	(0.666)
$\overline{E4}^*$	-4.182	-3.404***
	(4.566)	(1.167)
$\overline{A3}^*$	-8.770	-6.640***
	(10.602)	(2.109)
$\overline{R5}^*$	23.400	8.988
	(17.374)	(5.528)
$\overline{R6}^*$	-22.359***	0.656
	(7.857)	(2.310)

Table 4
Cont.

	Logit (3)	Logit (4)
	Open Membership versus Merged into Another j = 2 in relation to j = 1	Transformations j = {1, 2}
$\overline{R11}^{*}$	-0.742	0.318
	(2.003)	(0.780)
nl(Total Assets)	2.134***	0.230***
	(0.309)	(0.072)
nl(Branches)	-1.334**	-1.005***
	(0.543)	(0.188)
nl(Age)	0.006	-0.210
	(0.315)	(0.148)
Capital and Loan (dummy)[a]	-	-1.337***
	-	(0.298)
State (dummies)	Yes	Yes
Credit Union System (dummies)	Yes	Yes
Constant	-30.025***	-2.110*
	(4.824)	(1.178)
Observations	540	1,370
Percentage of correct forecasts	86.67%	75.77%
Likelihood Ratio ($\chi^2_{[d.f.]}$)	406.22***	508.14***
	[34]	[41]

Note. Standard errors are below the coefficients and degrees of freedom (d.f.) are below the χ^2.

[a] Omitted in Logit (3) because no capital and loan adopted open membership.

*** p<0.01, ** p<0.05, * p<0.10

Source: The Authors.

6. CONCLUSIONS

This work associates the transformation of Brazilian credit union's ownership structures with expectations reflected in their banking services rates. We have investigated whether the abnormal bank spread, representing the difference between the bank spread operationalized by the credit union and the expected bank spread due to its characteristics, increases the probability of the adoption of open membership or being merged by another credit union. The results indicate a positive association between the abnormal bank spread and both transformations, suggesting that members approve these transformations looking for access to better banking services rates. There is also an order in which higher abnormal bank spreads are associated with a greater probability of adopting open membership, reflecting the directors' seeking of private benefits, while mergers associate with poor management.

This work makes both theoretical and practical contributions. Its theoretical contribution is identifying that the expectations of internal actors in credit unions are determinants in their ownership structure transformations. This distinguishes this study from previous works which

assume the passive logic that transformations, particularly mergers, occur just due to financial performance and are determined by exogenous factors such as the pressure from other credit unions or regulatory bodies. Our findings highlight the importance of the control exercised by the members and directors, individuals who effectively make the credit union's decisions. Thus, suggests continuing investigation of the possible expectations of members and directors in important organizational decisions so that this logic of active, rather than passive, control can be strengthened.

There are two practical implications. Since open membership increases the margin for directors to seek private benefits, it is possible that the available banking service rates will not improve after it is adopted. This suggests a reinforcement of monitoring and incentives for following the best practices of corporate governance in these credit unions to ensure that their members are not harmed. The poor performance of the merged into another credit union, in turn, highlights the importance of mergers as a mechanism to transfer control. Mergers should be encouraged to benefit the credit unions system. The members of target credit unions continue to be associated with a credit union and do not have to pay for possible losses which could occur if their credit unions were liquidated. Regulatory bodies benefit from the scale, financial robustness and the maintenance of the assets that would be lost in these liquidations.

Limitations of this study include the difficulty to deal with the possible relationship between banking service rates and financial performance because these are variables that correlate over time. Even so, this work can inspire other studies. We did not investigate split-offs due to their low frequency, but they could be examined in qualitative studies. The acquirers could be examined in terms of the private benefits that their directors seek, because mergers cause a shock in the ownership dispersion greater than adopting open membership. Mergers benefit the credit unions system but need to be well monitored. Finally, studies can investigate the interaction between directors and regulatory bodies. Directors can influence not only members, but also regulatory bodies to achieve transformations that will be to their benefit.

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NOTES

1 Data from the Central Bank and the Brazilian Revenue Service, treated by the Observatory of the Cooperative Organizations of the University of São Paulo and available upon request to the corresponding author.

2 The types are the main banking services operated by the credit union, which may be payroll loans and rural credit, or when there is no predominance, banking services in general. Operational categories of credit unions are capital and loan, classic, and full services.

3 Financial indicators specific for credit unions, as detailed in Bressan et al. (2011).

AUTHOR CONTRIBUTIONS

The authors contributed to each section of this work.

FINANCIAL SUPPORT

This study was made possible by support from the Coordination of Improvement of Higher Education Personnel (CAPES) – Financing Code 001.

CONFLICT OF INTEREST

We declare that there are no conflicts of interest.