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Growth of Credit Unions in Costa Rica: What are the Determinants?

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Abstract: Credit unions in Costa Rica featured rates of growth exceeding those of privately and State-owned commercial banks, after the deepening of the reform of the financial sector that was completed by 1995. However, little is known about the drivers of such growth. The objective of this study is to investigate the determinants of the growth of Costa Rican credit unions after the financial reform. Using panel data regression on a sample of 27 credit unions, we found that the reform of the financial system allowed credit unions to reduce their capital to enhance their growth. Higher surpluses (the equivalent of profits in the context of credit unions) was another driver of growth. In some cases, mergers also, appear to have enhanced growth. The size of the credit union in the previous year was positively related to its growth. Our results show no evidence of association between the age of the credit unions and their growth. Debt in arrears does not appear to influence or limit growth. Our study provides explanations for the important growth exhibited by credit unions in Costa Rica. It also offers guidance to regulators and managers of credit unions on what can be done to promote the growth of credit unions.

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Introduction

By the mid-1980s, the Costa Rican government began the implementation of major reforms in the regulation of the financial industry (González-Vega, 1990; Lizano, 2004). These changes in the regulatory environment led to the removal of several controls over portfolios and interest rates, which had previously been set on a yearly basis by the Central Bank of Costa Rica and imposed upon the State-owned commercial banks. The latter had dominated the banking industry since 1948, when the junta that took power after a civil war nationalized three banks, namely, Banco de Costa Rica, Banco Anglo Costarricense and Banco Crédito Agrícola de Cartago. The decree of the government had also established that the newly nationalized banks, together with the Banco Nacional de Costa Rica, which had been wholly owned by the State since its establishment in 1914, were the sole institutions able to issue chequing and savings accounts to the public (González-Vega & Messalles, 1988; González-Vega, 1990). With the enactment of Law No. 7558 in 1995, the State-owned commercial banks lost all their exclusive privileges over the issuing of chequing and savings accounts. A new regulator, the Superintendencia General de Entidades Financieras (SUGEF, by its Spanish acronym) was created, with greater autonomy and wider powers than its predecessors (Cerdas & Melegatti, 2014; García, 2004; Goldstein, 2001).

During the period covered in our study (1996-2017), Costa Rican credit unions experienced strong growth in this new regulatory environment. Data from the website of SUGEF show that by 1996 the credit unions it regulated owned assets valued at 42.18 billion Costa Rican colones (approximately 192.3 million US dollars). By the end of 2017, the value of their assets had jumped, in nominal terms, to 3.19 trillion Costa Rican colones (roughly 5.63 billion

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US dollars), thus growing at a compound rate of 22.87% per year. The growth of credit unions outpaced other major players in the financial market, such as State-owned and private-sector banks, which exhibited compounded annual rates of growth of 14.42% and 20.34%, respectively, between 1996 and 2017. Profits also grew considerably during the period under study. They were approximately 5.7 billion Costa Rican colones in 1996, jumping to 38.8 billion Costa Rican colones in 2017, almost a seven-fold increase. More recent data, also from SUGEF, reveal that the growth of credit unions is not a passing trend. In fact, by the end of 2018, the ensemble of credit unions possessed assets valued at 3.43 trillion colones (about 5.68 billion US dollars). The latter figure grew to 4.21 trillion Costa Rican colones at the end of 2022 (roughly 7.09 billion US dollars). Thus, the nominal value of the assets held by credit unions grew at an annual compound rate of 5.27%, higher than the rate exhibited by State-owned commercial banks (4.34%), and second only to private sector-owned banks, which exhibited a 5.42% annual compound rate during the years 2018-2022.

González-Vega (1990) asserted that the control of chequing accounts by State-owned commercial banks was the most important distortion in the Costa Rican financial system at the dawn of the 1990s. Moreover, in 1995 SUGEF adopted an *ex ante* prudential regulatory approach that replaced the *ex post*, repressive scheme applied beforehand (SUGEF, no date). Little is known about the determinants of the growth of credit unions after the important changes that took place in 1995.

Given the increasing importance of credit unions,in this article we investigate the determinants of their growth after the abolition of the monopoly of State-owned banks over the issuing of chequing and savings accounts and the establishment of SUGEF, two measures that constitute a major landmark in the evolution of the financial industry in Costa Rica (Cerdas & Melegatti, 2014; García, 2004). Although credit unions did not receive the power to issue chequing accounts, as we discuss further, they were able to take advantage of the new financial environment.

To the best of our knowledge, the determinants of the growth of Costa Rican credit unions has not received scholarly attention before. It is, nonetheless, a subject of great academic and social importance. Credit unions have become major players in the Costa Rican financial market. In 1996, at the outset of the new regulatory environment, the credit unions supervised by SUGEF held about 3.7% of all assets owned by financial institutions in Costa Rica. By 2017, that indicator had almost tripled, to 9.9% (Rojas et al., 2018). Moreover, the World Council of Credit Unions reported that 628,914 individuals had been served by 66 credit unions in Costa Rica during the year 2021. Thus, members of credit unions in the country represented nearly 18% of the economically active population with an age range from 15 to 64 years old, slightly higher than the corresponding figure for Latin America, which was 16.50% (World Council of Credit Unions, 2021). Credit unions are not-for-profit organizations and, as such, they are not required to satisfy simultaneously both the maximization of shareholder profits and disparate consumer needs (McKillop & Wilson, 2015). Their management can instead strive for other goals, such as bringing financial services to a wider segment of the population, particularly to people excluded by traditional banking institutions. The attainment of such goals would imply, in the case of credit unions, a greater emphasis on growth, rather than on profitability. Knowledge of the determinants of the substantial growth exhibited by Costa Rican credit unions could help the global credit union movement to build new development strategies based on the Costa Rican experience. Cooperatives are recognized as an important third sector that can fill the gaps that arise between the public and private sectors (Ishak et al., 2020). Their growth (or that of a specific group of them, such as credit unions) could be of interest for policymakers in many countries.

Our article aims to shed light on the determinants of the observed growth of Costa Rican credit unions. The literature on the determinants of growth in other settings is rather sparse. Mamun (2023) studied the growth of the largest 100 credit unions in Canada. The author found evidence of a positive relationship between size and growth. However, the research pointed to diseconomies of scale, i.e., larger credit unions exhibited slower growth than their smaller counterparts. Mergers did not seem to affect growth in the Canadian context. Growth also appeared to be positively related to the cost-to-income ratio and negatively to a higher capital-to-asset ratio. Goddard et al. (2002) examined the growth of credit unions in the United States during the 1990s. They found that that there was a positive and significant relationship between size and growth, although this result mostly applied to the state-chartered credit unions and not to the federally-chartered ones. The authors also pointed out that large credit unions tended to grow faster than their smaller counterparts because they were more efficient or exhibited lower levels of capital

or bad-debt ratios. The results also suggest that the age of the credit unions hinders their growth. Goddard & Wilson (2005) analyzed the growth of US credit unions for the period 1992–2001 and the relationships between size, age, and growth. They found that larger credit unions grew faster than smaller credit unions. State-chartered credit unions grew faster than federally-chartered credit unions, and single-bond credit unions grew faster than multiple-bond credit unions. The younger credit unions tended to outgrow the older ones. Barron et al. (1994) analysed the evolution of state-chartered credit unions in New York City from 1914 through 1990, focusing on the effects of organizational age, size, and population density on rates of organizational failure and growth. Their results showed that small, older institutions are more likely to fail, while small, younger organizations exhibited the highest growth rates. Moore (2005) studied the determinants of the growth of 44 credit unions in Barbados during the years 1975 to 2001. The author found that size is an insignificant factor in the growth of credit unions. Age, as in the case of the study by Barron, was inversely related to growth. Efficiency appeared positively connected to growth.

Drawing on the extant literature on the growth of credit unions, we examine in our study the role of several potential drivers of growth for Costa Rican credit unions during the chosen period. Those indicators include the size of the credit union, their organizational age, the value of capital as well as the value of surpluses, mergers, and debt in arrears. Our findings could help governmental agencies and credit unions to promote the growth of the latter. Credit union managers could revise their strategies based on our findings. Regulators could also benefit from our insights, because they can help them to assess whether credit unions that emphasize the factors identified in this paper would thereby increase the risks that they assume, with eventual impacts on the level of systemic risks confronted by the Costa Rican financial system.

The remainder of the article goes as follows. The next section presents a review of the literature and the formulation of the hypotheses, followed by a section explaining the methodology. A fourth section presents the results, followed by a section in which these are examined. A concluding section summarizes the paper. The last section suggests avenues for future research.

Related Literature on the Determinants of the Growth of Credit Unions and the Development of the Hypotheses

This section reviews the findings in previous literature on the determinants of growth, mostly in the realm of credit unions, and develops several hypotheses concerning the factors that appeared to affect the growth of the latter in Costa Rica during the period under scrutiny. Those hypotheses involve the following indicators: the size of the credit union, its organizational age, and the value of capital, surpluses, and debt in arrears, as well as the frequency of mergers.

The discussion on the impact of size on growth, for all kinds of organizational forms, goes back to Gibrat (1931), who asserted that the size of the firms is unrelated to their growth. The analysis of the extant literature on the growth of credit unions points to contradictory conclusions concerning the impact of size and organizational age on growth. Mamun (2023) studied the growth of the largest 100 credit unions in Canada. The author found evidence of a positive relationship between size and growth. However, the research also pointed to diseconomies of scale, i.e., larger credit unions exhibited slower growth than their smaller counterparts.

Goddard et al. (2002) analyzed the determinants of the growth of credit unions in the context of the United States. Their analysis of a sample of 7,603 credit unions in the United States during the period from 1990 to 1999 showed that there was a positive and significant relationship between size and growth. This positive association concerned single common-bond credit unions (i.e., credit unions whose members had to comply with a certain single prerequisite, such as employment in a certain organization or residence in a specific geographic area) and state-chartered credit unions. The relationship between size and growth was negative in the case of federally-chartered credit unions. Goddard et al. determined that this result could reflect the fact that larger credit unions benefited most from the more liberal regulatory schemes prevailing at the state level.

Goddard & Wilson (2005) analyzed the growth of US credit unions for the period 1992–2001 and the relationships between size, age, and growth. They found that larger credit unions grew faster than smaller credit unions. State credit unions grew faster than federal credit unions, and single-bond credit unions grew faster than multiple-bond

credit unions. The younger credit unions tended to outgrow the older ones. This seems consistent with a life-cycle typology of credit union growth and development. There is also evidence of a positive persistence of growth effect. They also found that the cross-sectional variance of growth is inversely related to size. Barron et al. (1994) investigated the evolution of state-chartered credit unions in New York City from 1914 through 1990 by analyzing the effects of organizational age, size, and population density on rates of organizational failure and growth. Their results showed that small, older, institutions are more likely to fail, while small, younger organizations exhibited the highest growth rates. Moore (2005) did not find a connection between growth and size of the credit unions in the Barbadian context.

The literature that focusses on the growth of organizations outside the realm of credit unions supports the view that size could have a positive effect on the prospects of growth of organizations, thus invalidating the proposition of Gibrat. For instance, Van Biesebroek (2005) provided evidence that size matters for growth in the context of manufacturing firms in nine sub-Saharan countries. According to the author's analysis, firms with 100 or more workers exhibited a greater ability to survive, grew more rapidly and improved productivity faster than smaller firms. Moreover, over time, large firms appeared to remain large and at the top of the size distribution of firms, while their smaller counterparts exhibited difficulty in advancing to the top of the size distribution of firms. Stam (2010) also reported several studies that contradicted the proposition of Gibrat on the independence of a firm's size and its growth.

In the Costa Rican context, we contend that there are additional elements which increase the likelihood that large credit unions could enjoy a higher rate of growth. Our explanation is two-pronged. First, smaller Costa Rican credit unions could experience difficulties in adopting new information technologies. Dow (2007) has shown that the larger credit unions in the United States adopted new information technologies faster than smaller ones. Secondly, the cost of complying with the new regulatory burdens brought about by the financial reform of 1995 reduced the competitive position of the smaller credit unions in Costa Rica, because it is possible to suspect that at least some of the costs of compliance, such as appointing officials to manage regulatory issues in the credit unions, could be similar for every organization, no matter its size.

Variables other than size could also have affected the growth of credit unions in Costa Rica during the period under scrutiny. Goddard et al. (2002) observed that older credit unions grew more slowly than their newer counterparts. Previous literature has suggested that the age of the credit unions could play a role in their growth, although the sign of this variable is still open to discussion. Older credit unions could benefit from barriers to entry of any sort that could disadvantage their younger counterparts. However, it is also possible that older credit unions may become "ossified," to employ the term from Goddard et al., limiting their growth. Goddard & Wilson (2005) provided evidence that the cross-sectional variance of growth is largely independent of age. However, other research in a non-credit union setting supports the view that the age of organizations could play a role in their growth. Anyadike-Danes & Hart (2018) examined the trajectories over a period of 15 years of the 239 thousand firms established in the United Kingdom in 1998. Although the mortality rate of young firms was quite high, they concluded that younger firms were more likely to grow than older firms, and that smaller firms that grew did so at a faster rate than older firms that were also able to grow.

Previous research supports the view that higher ratios of capital to assets hinder the growth of credit unions. Mamun (2023) found a significant and negative relationship between the ratio of total capital to total assets. This author contends that such a result suggests that credit unions with less opportunities to expand have larger capital-to-asset ratios. Goddard et al. (2002) also found a negative relationship between a higher capital-to-asset ratio and growth. They suggested that credit unions exhibiting high capital-to-asset ratios may be over-cautious, hampering their growth.

Credit unions are not-for-profit organizations. Their bottom line is usually called "surpluses." We hypothesized that in Costa Rica, as in the United States, the ability of credit unions to grow must be positively linked to their ability to generate surpluses that can be reinvested to provide loans to members. Unlike conventional banks, credit unions cannot raise funds in the capital markets (Ory et al., 2006). In order to grow, credit unions must rely either on capital provided by new and present members or generate more surpluses that can be reinvested. Because the

contributions of members to the capital of credit unions are normally set at a very low level (Rojas et al., 2018), this source of capital is unlikely to fuel growth. Therefore, we hypothesized that credit unions exhibiting high levels of surpluses grew faster than their less profitable counterparts. Goddard et al. (2002) supports the view that the ability of credit unions to generate surpluses enhances their prospects of growth. Their article shows that return on assets is positively connected with growth. Goddard et al. (2002) reasoned that higher levels of bad debts could signal inefficient management, affecting the growth of credit unions negatively. They found empirical support for their insight.

Mergers could have the potential to enhance the growth of credit unions in Costa Rica. Larger credit unions, in the hope of benefiting from economies of scale or scope, could be tempted to merge with their smaller counterparts to fuel their own growth. Smaller credit unions, for their part, could have encountered problems in implementing new information technologies, or in complying with the more astringent regulations brought about by SUGEF, or could face lower prospects of growth. Merging with larger credit unions could have been a way for them even to survive. Nevertheless, mergers might fail to support subsequent growth. Mamun (2023) reports that mergers were frequent in the Canadian context during the scrutinised period, although they did not foster growth. Goddard et al. (2014) reported an important consolidation process in the credit union movement in the United States, either because of failure or merger. According to their study, smaller credit unions were at a higher risk of being acquired during the period under scrutiny (1994-2010). After controlling for size, older credit unions exhibited an increased likelihood of being acquired. They also reported that credit unions holding a high proportion of their assets in liquid form, and credit unions with low loan-to-asset ratios were at higher risk of being acquired or of failing. Although the authors did not study the impact of mergers on subsequent growth, they concluded that the merger activity had a modest impact on concentration of the industry, which is in our view consistent with a low impact on growth. In the end, the impact of mergers on the growth of Costa Rican credit unions is an empirical question and, consequently, a variable that proxies them should be introduced into our study.

Drawing on the previous literature, we present the following hypotheses guiding the rest of our investigation.

H1. The size of a credit union in a given year is positively related to the credit union's growth in the subsequent year.
H2. Higher levels of capital are negatively related to the growth of credit unions.
H3. Higher surpluses are positively related to the subsequent growth of credit unions.
H4. Mergers are related to the growth of credit unions.
H5. Bad debt in one given year is negatively related to credit unions' growth in the subsequent year.
H6. The age of credit unions is negatively related to their growth.

Methodology and Data

To inquire into the variables that could have had an impact on the growth of credit unions in Costa Rica during the years 1996-2017, we ran a panel regression. Our sample covers the entire population of the Costa Rican credit unions regulated by SUGEF as of December 2017, a total of 27 credit unions. Costa Rica has a single level of government (Lehoucq, 2000; Walker & Waterman, 2008). Therefore, credit unions are only chartered by the national government, and never by a state or a province, as is the case of the United States and Canada. Credit unions in the United States can be chartered at the federal or the state level, with different impacts in terms of the regulatory environment. In Costa Rica, "open-bond" credit unions, i.e., those without a restrictive membership requirement, are regulated by SUGEF if they possessed assets of 1,266 million Costa Rican colones as of December, 2017. SUGEF has been compiling information about the credit unions falling under its watch since its inception in 1995. That database is available to the public in Spanish on the website of SUGEF (www.sugef.fi.cr), and data on credit unions are available from 1996 onwards. We drew on SUGEF's database to obtain data concerning size and other accounting variables also employed in our study, such as values of capital, net surplus, and debt in arrears for 90 days or more (bad debt). In a few cases, the information we required was missing from the database, and we complemented it with information provided by the Instituto Nacional de Fomento Cooperativo (Infocoop). It is important to highlight that SUGEF deletes data on credit unions that are no longer independent entities, because of a merger or

bankruptcy. In the annex, we present the name of the credit unions, their year of inception as well as the number of times that they merged during the period 1996-2017.

Credit unions exhibited a great deal of variation in the variables under study. Observations for size, for instance, varied from 29.24 million Costa Rican colones to 725.1 billion Costa Rican colones. Debt that had been in arrears for 90 days or more or that is under judicial collection procedures also showed a great deal of variation. Its average value was 347.8 million Costa Rican colones, with a minimum of zero and a maximum of 7.01 billion Costa Rican colones. Strong variations between observations could also be found for the variables capital and surplus (the equivalent of after-tax net income in the case of for-profit organizations). Values for capital ranged from minus 629. 6 million Costa Rican colones to a maximum of roughly 118 billion, while the surplus minimum was minus 1.3 billion Costa Rican colones and its maximum was 23.5 billion. In all cases, we present data which has not been adjusted for inflation. Credit unions exhibited a great variation in terms of their age. The oldest credit union had been active for 62 years. The youngest had existed for just two years, and the average was roughly 38 years. Table 1 presents descriptive statistics for the data included in our study. Following Goddard et al. (2002) and Mamun (2023), we measured size in terms of the nominal accounting value of total assets. Goddard et al. (2002) used this metric to measure the size of the credit unions in their sample as well, but they also relied on membership as an alternative measure. We did not have access to information on membership, which prevented us from using this metric as a proxy for the size of the credit unions included in our sample.

Table 1: Descriptive Statistics (Accounting Values in Thousands of Costa Rican Colones)

Variable	No. observations	Mean	Std. deviation	Min.	Max.
Size	548	38,086,937	102,383,570	29,239	725,058,070
Bad debt	453	347,823	892,994	0	7,066,697
Capital	548	7,433,352	17,757,745	-629,573	118,040,650
Age (years)	584	37.7	11.7	2	62
Surplus	544	823,693	2,116,466	-1,300,619	23,493,349

Data on mergers between credit unions that took place during the period under scrutiny were provided by the staff of SUGEF. To obtain the age of organizations in any year of the study, we drew on the website of each credit union in our sample, to identify their year of inception. If the information was absent on their site, we obtained the information by means of phone calls. Eight mergers took place during the period 1996-2017. As was previously stated, SUGEF deletes data concerning credit unions which have disappeared after a merger, reporting only data for the surviving entity. One of the credit unions in the sample merged with other credit unions five times; three other credit unions merged once. We created four dummy variables to deal with mergers. A dummy variable took a value of zero the year that the merger took place and all years before. It took a value of one the year after the merger happened and all subsequent years. It is important to highlight that only one credit union, Coopealianza, merged more than once. Its fifth merger was at the end of the period covered by the study, leaving extremely few observations different from zero and so we dropped it from the analysis.

Results

In order to test the hypotheses of our study, we ran an equation, using panel regression. The equation comprised all the variables presented in the hypotheses, namely size, capital, surplus, bad debt, mergers and age of the credit union. We also included in this equation a dummy variable for each of the years covered in the sample, in order to capture the influence that the economic environment may have had on the growth of Costa Rican credit unions during the years under scrutiny. The model to estimate is described in Equation 1.

Equation 1

$$ln\, S_{it} - ln\, S_{it-1} = B_0 + B_1 lnS_{it-1} + B_2(lnC_{it} - lnC_{it-1}) + B_3\,(lnSurplus_{it} - lnSurplus_{it-1}) + B_4(lnB_db_{it} - lnB_db_{it-1}) + B_j Merger_j + B_6 Age_{it-1} + B_j Year_j + u_t \quad (1)$$

Where:

$ln\, S_{it} - ln\, S_{it-1}$= growth of CU *i* from *t-1* to *t*;

lnS_t= natural logarithm of the size of the CU *i* at the time *t,* measured by the nominal value of total assets;

lnC_t = natural logarithm of the nominal value of capital of the CU *i* at the time *t*;

$lnSurplus_t$= natural logarithm of the surplus of the CU *i* at the time *t*;

$ln\ B_dt_t$= natural logarithm of the value of debt in arrears for 90 days or more of CU *i* at time *t*;

$Merger$= a dummy variable assuming a value of one after the years following the merger *j* = 1, 2, 3,4 for the prevailing CU and zero otherwise;

Age_t= number of years passed since inception of CU *i* at time *t*;

Year = dummy variable for each of the years j=1997 ..., 2017, and;

u_t = a stochastic term.

Panel-regression estimates of the equation support the view that size is positively connected to growth. The coefficient for size, measured by the natural logarithm of the value of total assets, lagged one period, appears positive and statistically significant. The result is consistent with our hypothesis 1, that larger credit unions outpace their smaller counterparts in terms of growth. We have speculated that there could be potential economies of scale in terms of investments needed to cope with regulatory issues, or in the provision of online services to members as potential explanations. Our empirical findings uphold this view.

Another potential driver of growth is connected with the hypothesised impact of reductions in the value of capital. The coefficient for the latter variable is negative and statistically significant. Moreover, the coefficient shows that the impact of the changes in this variable is economically significant. A reduction of one percent in the value of capital would lead to an increase of approximately 0.79 percent in asset growth. Our estimates also give credence to the proposition that the ability to generate surpluses helped to sustain the growth of credit unions during the period under scrutiny. Our estimate of the coefficient for this variable was positive and significant at a 90 percent level of confidence. The estimated coefficient for the variable bad debt is not statistically significant. We speculate that the regulator was able during the period to assure levels of bad debt that did not compromise the capacity of the credit unions to grow. Our results are consistent with the findings reported by Goddard et al. (2002).

Mergers exhibit a rather fragmented picture. The dummy for the first and the second mergers shows no significant impact on the ability of credit unions to grow. This contrasts with the coefficients for the dummy variables associated with subsequent numbers of mergers, which were positive and show a high level of confidence. It is important to

recall at this point that only one of the credit unions (Coopealianza) in our sample merged more than once, and thus, dummy variables two to four refer to it. For this credit union, the mergers thus helped in most cases to foster its growth.

The dummy variable that proxies for the economic environment shows that, in many cases, the year had an impact on the ability of credit unions to grow. It is worth mentioning that the coefficient for the dummies of each of the years from 2010 to 2017 is negative and statistically significant, suggesting that the economic conditions of the country or the operation of the financial system during those years negatively affected the ability of credit unions to grow. This period coincided with the aftermath of the financial crisis of 2007-2008, which started in the United States but spread to other countries through financial and trade linkages (Alvi, 2017). Naturally, other factors connected with the Costa Rican economy could also have played a role in reducing the credit unions' ability to grow after 2010. The coefficient for age is not significant, suggesting that older credit unions do not enjoy an advantage over their younger counterparts in terms of growth.

Table 2: Estimation of Panel Regression Models, First Differences, Dependent Variable: $\boldsymbol{ln\, S_{it} - ln\, S_{it-1}}$

	Estimated parameters
lnS_{it-1}	.0184872*** 4.70
$lnC_{it} - lnC_{it-1}$	-.7956253*** -15.21
$lnSurplus_{it} - lnSurplus_{it-1}$	.0261388* 1.73
$lnB_db_{it} - lnB_db_{it-1}$	.0021111 0.68
$Merger\ 1$	.0027627 0.16
$Merger\ 2$	.007872 0.48
$Merger\ 3$	.0941298*** 8.57
$Merger\ 4$	.1189494*** 8.25
Year 1998	-.0784129*** -2.98
Year 1999	-.1365761** -2.51
Year 2000	-.0048975 -0.18
Year 2001	-.0160105 -0.37
Year 2002	-.0279441 -0.61
Year 2003	-.0086441 -0.20
Year 2004	-.0125348 -0.32
Year 2005	-.000202 -0.01

	Estimated parameters
Year 2006	-.0131437 -0.29
Year 2007	.0023182 0.04
Year 2008	-.0451717 -0.96
Year 2009	-.086969** -2.04
Year 2010	-.1237967*** -2.68
Year 2011	-.1297187*** -2.89
Year 2012	-.1355754*** -2.82
Year 2013	-.143796*** -3.11
Year 2014	-.1575368*** -3.72
Year 2015	-.1593613*** -3.64
Year 2016	-.1863784*** -4.22
Year 2017	-.2002235*** -4.28
Age_{t-1}	-.0006143 -0.85

Coefficients are presented first, followed by *t* statistics beneath.

*, **, and *** denote significance at the 10, 5, and 1% levels, respectively.

Discussion

Costa Rican credit unions have experienced important growth since the implementation of changes in the regulatory system of the financial system that took place in 1995. In this study, we inquired into the determinants of such growth. The information provided in this article could be very valuable for managers and leaders of credit unions, since the latter, being not-for-profit organizations, might seek to improve their rate of growth.

Managers and leaders of credit unions could revise their strategic planning based on our conclusions. Credit unions in Costa Rica that intend to grow must decrease the reliance on capital to finance their assets; in other words, they must increase their leverage. Moreover, if managers and leaders of credit unions decide to rely on this driver of growth, they have plenty of room to manoeuvre, because the ratio of capital to assets exhibited by credit unions is much higher than the corresponding metric in the case of the two main players in the Costa Rican financial system, namely State-owned and private-sector banks (Rojas et al., 2018). Our findings are consistent with those of Mamun (2023) and Goddard et al., (2002). The former suggested that the negative relationship between the ratio of capital to assets and growth shows that credit unions with higher ratios of capital to assets lack opportunities to expand lending. Goddard et al. points to what they call “over-cautious” management.

The latter result warrants closer examination of the underlying mechanisms that may induce growth because of a decrease in capital. Although a sound conclusion demands more research, we propose an alternative view of the Costa Rican case, which is based on the signalling theory. The signalling theory supports a complementary

explanation for credit unions choosing to exhibit higher capital-to-asset ratios. In the context of that theory, when there is informational asymmetry between the vendors and buyers of a product and the latter look for an unobservable condition (quality, for instance), the vendors could send a signal to the buyers to clearly convey the message that the products do indeed have the desirable characteristic. To succeed, however, the signal itself should have certain traits, the most notable of them being that it should be costly (Spence, 2002). In order to attract deposits from their existing and potential members, managers of credit unions may want to signal to them that the credit unions they run are financially sound and able to resist possible bank runs. Higher capital-to-asset ratios (or higher levels of capital) are thus a signal to the public that managers of credit unions could successfully face economic downturns or declines in the confidence of the public. These higher levels of capital could be costly, though, in terms of growth. For instance, in many cases, members of credit unions are obliged to earmark a certain percentage of the loans as a contribution to the capital of the credit union. Although members can normally obtain a return on the capital invested in their credit union via distribution of surpluses, forcing them to increase their supply of capital when they obtain a loan clearly increases the cost of the latter, impairing the competitiveness of credit unions and, consequently, their ability to grow.

Rojas et al. (2018) reported that the credit unions included in their sample exhibited a non-weighted average of capital to assets of 24.2% during the years 1996-2016, much higher than the corresponding metric exhibited by State-owned banks (8.8%). They also reported a substantial decline in the ratio of capital to assets exhibited by credit unions, a trend that, in our view, contributes to explaining the high growth experienced by credit unions in Costa Rica after the reform of 1995. We reason that if the need for a signal arises from an asymmetry of information among the parties involved in transactions (management of credit unions and potential and extant members), better regulation could have reduced information asymmetry and thus, the need for high reserves of capital. Our explanation is very likely incomplete, and more research should be done to better understand the mechanisms of the connection between increased growth and less reliance on capital.

If our reasoning is correct, though, managers could also draw on devices to signal the good economic prospects of their credit unions other than higher levels of capitalisation. For instance, in 2020, credit unions in Costa Rica created a system of deposit insurance. Credit unions are not obliged to join the scheme, but it has been reported that 12 credit unions, which held more than 90 percent of the assets managed by all credit unions, have adopted the deposit-insurance called Fondo FGA Confía (Arzbach et al., 2020).

Our conclusions concerning capitalisation could also help regulators to revise their work. If reductions in the value of capital may serve to fuel growth of credit unions, it can certainly increase their risk as well. Our research is not able to say if there is a minimum level that they should attain. Regulators could come up with a response.

We conclude that the growth of credit unions in any given year is positively related to their size in the previous year. However, getting bigger by means of mergers is not always connected to faster growth. It was the case for the sole credit union that went through multiple mergers, but not for the others. This finding leads us to speculate that some the mergers have been driven by non-financial motives.

Managers and leaders of older credit unions should also take note that competitive advantages built over time cannot be easily sustained in the Costa Rican sector, as age does not appear to be linked to subsequent growth.

Conclusion

From the mid-1980s to the mid-1990s, Costa Rica advanced important reforms of its financial sector. The non-market setting of interest rates and governmental allocation of credit by State-owned banks were abolished. Later, the privilege of State-owned banks to be the sole issuers of chequing and savings accounts was also terminated. A new and autonomous regulatory agency was created, and it implemented an *ex ante* prudential regulatory approach. Credit unions were able to benefit from these reforms. They grew faster than private-sector banks and State-owned commercial banks after the reforms that took place in 1995. We inquired into the variables that have had an impact on the growth of credit unions. Based on previous literature, we studied the impact of several variables on the growth of Costa Rican credit unions, during the period 1996-2017.

Our results confirm the hypothesis that larger credit unions grow faster than their smaller counterparts. The reforms allowed credit unions to reduce their levels of capital. High ratios of capital to assets point to an overcautious (or inefficient) operation of the credit unions, or a need to signal good economic prospects to wary existing or potential members. A reduction of capital enhanced the growth of credit unions during the period under study.

Credit unions cannot raise funds in the capital markets, making the generation of surpluses very important for their growth. Our data upheld the view that increments of surpluses enhanced the ability of credit unions to grow during the period under scrutiny. On the other hand, bad debt seemed not related with the capacity of credit unions to grow.

Our evidence gives a rather fragmented picture with regard to mergers. This is consistent with the findings of Mamun (2023) in the Canadian context. Mergers could be proposed in order to capture economies of scale and synergies, but also for other reasons connected with the particular interests of the managers and the leadership of credit unions involved in the decision. In one case, the only credit union that participated in a merger more than once, we found that the first and second mergers were not connected with future growth, while subsequent mergers had a positive impact on growth. It is possible that this particular credit union learned from previous experience how to target partners that were suitable for fostering growth for the combined entity. Another explanation may come from the fact that those credit unions that merged only once did so for the wrong reasons, in terms of achieving growth.

It is important to highlight a limitation of our study. As indicated above, we collected our information from the database of the regulator of financial institutions, the SUGEF. The latter deletes from its database all information about entities that are no longer in operation, because of bankruptcy or merger. We were not able to find an alternative source for the information on credit unions that had ceased their operations. This exposes our analysis to survivor bias. Future researchers on our topic could identify other sources of data, including information about credit unions that are no longer independent entities, to compensate for this limitation of our study.

Future Research

Costa Rican credit unions experienced rapid growth after the financial reform of 1995. Our study is, to the best of our knowledge, the first effort to examine what the drivers of such growth are. Other researchers could benefit from our research and expand knowledge of the topic under discussion. We relied on a quantitative approach to study the growth of credit unions in Costa Rica. However, a qualitative approach could also shed light on the topic. Future researchers could pursue this avenue of research. Secondly, we found that one of the most potent drivers of growth is the reduction in the levels of capitalisation, a finding consistent with previous literature. However, we believe that the mechanisms underlying the result should be examined in depth, to provide better guidance to managers. Mergers of credit unions also deserve additional research. So far, only one credit union has exhibited the capacity to increase growth by means of mergers, and only after two previous mergers took place. It is possible that its managers and leaders had learned how to exploit mergers to grow, or that in other cases, mergers were not motivated by the desire to enhance growth. The nature of mergers needs to be better understood, because size appears connected to subsequent growth. Qualitative research may be particularly useful in shedding light on this topic.

References

Alvi, E. (2017). The Great Recession, fallout, and what we learned. In: *Confronting policy challenges of the Great Recession. Lessons for macroeconomic policy*. Alvi, E. (ed.), W. E. Upjohn Institute.

Anyadike-Danes; Hart, M. (2018). All grown up? The fate after 15 years of a quarter of a million UK firms born in 1998. *Journal of Evolutionary Economics*, 28, 45-76, https://doi.org/10.1007/s00191-017-0549-x

Arzbach, M.; Baéz, B.; Durán, A.; Jaap, C.; Müller, C. ; Nerger, K. (2020). Protección de depósitos para bancos y cooperativas de ahorro y crédito en América Latina. Una muestra de 17 países. Retrieved March 24, 2023 from https://www.dgrv.coop/es/publication/proteccion-de-depositos-para-bancos-y-cacs-en-america-latina-y-el-caribe/

Barron, D.; West, E.; Hannan, M. T. A time to grow and a time to die: Growth and mortality of credit unions in New York City, 1914-1990. *American Journal of Sociology*, 94 (100), 381-421.

Cerdas, A.M. & Melegatti, C. (2014). *El Sistema financiero en los últimos años: El sistema de pagos*. San José, Academia de Centroamérica.

Dow, J.P. (2007). The adoption of web banking at credit unions. *Quarterly Review of Economics and Finance*, 47, 435-448.

García, R. (2004). *Moneda, banca y política monetaria*. San José, Editorial Universidad Estatal a Distancia.

Gibrat, R. (1931). *Les inegalités économiques*. Paris, Sirey.

Goddard, J. McKillop, D. & Wilson, J.O.S. (2002). The growth of US credit unions. *Journal of Banking and Finance*, 26, 2327-2356.

Goddard, J. McKillop, D. & Wilson, J. O. S. (2014). U.S. Credit unions: Survival, consolidation, and growth. Economic Inquiry, 52 (1), 304-318.

Goddard, J.; Wilson, J.O.S. (2005). US credit unions: An empirical investigation of size, age and growth. *Annals of Public and Cooperative Economics*, 76 (3), 375-406.

Goldstein, D. (2001). Financial reform and sustainable development: the case of Costa Rica. *Ecological Economics*, 37, 199-215.

González-Vega, C. (1990). Políticas de intermediación financiera en Costa Rica: Cuatro décadas de evolución. The Ohio State University. Economics and Sociology Occasional Paper No. 1718. Retrieved May 12, 2018 from https://kb.osu.edu/bitstream/handle/1811/66227/CFAES_ESO_1718.pdf?sequence=1 [May 12, 2018]

González-Vega, C. & Mesalles, L. (1988). The political economy of bank nationalization: The case of Costa Rica, 1948-1988. The Ohio State University. Economics and Sociology Occasional Paper No. 1525. Retrieved June 25, 2018 from https://kb.osu.edu/dspace/bitstream/handle/1811/66060/CFAES_ESO_1525.pdf?sequence=1

Ishak, S., Omar, A. R. C., Sum, S. M., Othman, A. S., & Jaafar, J. (2020). Smallholder agriculture cooperatives' performance: What is in the minds of Management? *Journal of Co-Operative Organization and Management*, 8 (2), 100-110.

Jácome, L. (2008). Central bank involvement in banking crises in Latin America. IMF Working paper, https://www.imf.org/en/Publications/WP/Issues/2016/12/31/Central-Bank-Involvement-in-Banking-Crises-in-Latin-America-21966, (March 20, 2023)

Lehoucq, F. E. (2000). Institutionalizing democracy: Constraint and ambition in the politics of electoral reform. *Comparative Politics*, 32 (4), 459-457.

Lizano, E. (2004). *Escritos sobre reforma financiera*. San José, Academia de Centroamérica.

Majundar, S.K.; Moussawi, R.; Yaylacicegi, U. (2013). Merger waves and firm growth: Contemporary historical evidence. *Annals of Public and Cooperative Economics*, 84 (1), 1-16.

Mamun, A. (2023). Understanding growth and its policy implications for Canadian credit unions. *International Review of Economics and Finance*, 86, 652-665.

McKillop, D.; Wilson, J. O. S. (2015). Credit unions as cooperative institutions: Distinctiveness, performance and prospects. *Social and Environmental Accountability Journal*, 35 (2), 96-112.

Moore, W. (2005). Is efficiency important for the growth of the Barbadian credit union industry?. Journal of Eastern Caribbean Studies, 30 (3), 28-43.

Ory, J.N., Jaeger, M & Gurtner, E.W. (2006). La banque à forme coopérative peut-elle soutenir durablement la compétition avec la banque SA ? *Finance Contrôle Stratégie*, 9 (2), 121-157.

Rojas, M.; Deschênes, S.; Ramboarisata, L.; & Leclerc, A. (2018). The competitive edge of credit unions in Costa Rica: From financial repression to the risks of a new financial environment. *Canadian Journal of Nonprofit and Social Economy Research*, 9 (2), 62-79.

Spence, M. (2002). Signaling in retrospect and the informational structure of markets. *American Economic Review*, 92 (3), 434-459.

Stam, E. (2010). Growth beyond Gibrat: Firm growth processes and strategies. *Small Bus. Econ.* 35, 129-135. DOI 10.1007/s11187-010-9294-3

SUGEF (Superintendencia General de Entidades Financieras (SUGEF)), 2018. Informe al público. Entidades supervisadas por la SUGEF. Retrieved July 2, 2018 from https://www.sugef.fi.cr/publicaciones/listado_entidades_sujetas_fiscalizacion/2017/01-%20Lista%20de%20entidades%20al%2010-03-2017.pdf.

Sung, N.; Gort, M. (2006). Mergers, capital gains, and productivity: Evidence from U.S. telecommunications mergers. *Contemporary Economic Policy*, 24 (3): 382-394.

Van Biesebroek, J. (2005). Firm size matters: Growth and productivity growth in African manufacturing. *Economic Development and Cultural Change*, 53, 3: 545-583.

Walker, L. D. & Waterman, R.W. (2008). Elections as focusing events: Explaining attitudes toward the police and the government in comparative perspective. *Law and Society Review*, 42 (2), 337-365.

World Council of Credit Unions (2021). World Council of Credit Unions Statistical Report. Retrieved July 30, 2023 from https://www.woccu.org/documents/2021_Statistical_Report

Annex: List of credit unions included in the study, and number of mergers

Name	**Year of inception**	**No. of mergers (1996-2017) and notes**
Coocique (Cooperativa de Ahorro y Crédito de la Comunidad de Ciudad Quesada R.L.)	1965	1
Coopavegra (Cooperativa de Ahorro y Crédito Antonio Vega Granados R.L.)	1957	0
Coopealianza (Cooperativa de Ahorro y Crédito Alianza de Pérez Zeledón R.L.)	1971 (Merger of two credit unions)	5
Coopeamistad R. L. (Cooperativa de Ahorro y Crédito La Amistad, R.L.)	1955	0
Coopeande No. 1 (Cooperativa de Ahorro y Crédito ANDE No. 1 R.L.)	1965	1
Coopeaserrí (Cooperativa Aserriceña de Ahorro y Crédito R. L.)	1966	0 (Ceased operations in 2015)
CoopeAyA (Cooperativa de Ahorro y Crédito de los Empleados del Instituto Costarricense de Acueductos y Alcantarillados R.L.)	1964	0
Coopebanpo (Cooperativa de Ahorro y Crédito de los Empleados del Banco Popular y de Desarrollo Comunal R.L.)	1972	0
Coopecaja (Cooperativa de Ahorro y Crédito de los Trabajadores del Sector Público Costarricense y las Empresas del Sector Salud R.L.)	1971	1
Coopecar (Cooperativa de Ahorro y Crédito Refaccionario de Alfaro Ruiz R.L.)	1968	0
Coopeco (Cooperativa de Ahorro y Crédito de los Empleados de la Contraloría General de la República R. L.)	1962	0

Name	Year of inception	No. of mergers (1996-2017) and notes
Coopefyl (Cooperativa de Ahorro y Crédito de los Empleados del Sector Público Privado e Independiente R.L.)	1958	0
Coopegrecia (Cooperativa de Ahorro y Crédito de la Comunidad de Grecia R.L.)	1965	0
Copejudicial (Cooperativa de Ahorro y Crédito de los Servidores Judiciales R.L.)	1981	0
Coopelecheros (Cooperativa de Ahorro y Crédito de los Productores de Leche R. L.)	1994	0
Coopemapro (Cooperativa de Ahorro y Crédito y Servicios Múltiples de Maestros Pensionados y en Servicio Abierto a la Comunidad R.L.)	1964	0 (No longer active in the financial sector)
Coopemédicos (Cooperativa de Ahorro y Crédito y Servicios Múltiples de los Médicos R.L.)	1984	0
Coopemep (Cooperativa de Ahorro y Crédito de los Empleados del Ministerio de Educación Pública R.L.)	1970	0
Coopenae (Cooperativa Nacional de Educadores R.L.)	1966	0
Coopeorotina (Cooperativa de Ahorro y Crédito de Orotina R.L.)	1965	0 (Merged with Coocique in 2013). No longer active)
Coopesanmarcos (Cooperativa de Ahorro y Crédito de San Marcos de Tarrazú R.L.)	1973	0
Coopesanramón (Cooperativa de Ahorro y Crédito Refaccionario de la Comunidad de San Ramón R.L.)	1966	0
Coopeservidores (Cooperativa de Ahorro y Crédito de los Servidores Públicos R.L.)	1957	0
Coopesparta (Cooperativa de Ahorro y Crédito de la Comunidad de Esparza R.L.)	1964	0
Credecoop (Cooperativa de Ahorro y Crédito para el Desarrollo R.L.)	1994	0
Servicoop (Servicios Cooperativos R.L.)	1959	0