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Abstract

Three Essays on Credit Unions

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This dissertation is comprised of three essays on issues related to the financial reporting practices of credit unions in the United States. The first essay relies on an agency theory perspective to examine the extent of earnings management in U.S. credit unions through loan loss provisions (LLP). The context of member-owned credit unions provides a different set of financial reporting incentives than the one typically found in shareholder-owned banks, thus providing an opportunity to extend earnings management research. The sample comprises U.S. credit unions above $50 million in total assets, between 2003 and 2016. Results show that credit union managers engage in income smoothing through the discretionary use of LLP to avoid earnings declines. Results also show that larger and better-capitalized credit unions engage in more earnings management, as do credit unions with a federal charter. Moreover, credit unions are driven by the incentive of merging to engage in earnings management. The findings are economically significant, and thus, relevant to policymakers contemplating new regulations since these managerial activities may place the cooperative principle at risk.

The second essay examines how competition affects risk-taking of a matched sample (by size and county) of banks and credit unions, and whether it affects differently credit unions and banks. Several measures of risk-taking are used in the study. The period of the study is from 2010 till 2017. First, univariate analyses are conducted to compare the risk-taking of the two types of institutions. We find that the means of the risk-taking measures do not differ significantly between banks and credit unions. Second, examining the difference in the risk-taking of credit unions and banks in a multivariate analysis, we find that banks' managers engage in riskier activities. Third, we examine the effect of competition on the risk-taking. We find that increased competition induces managers of credit unions and banks to take more risk; this finding supports the competition-fragility hypothesis. We also find that credit unions' managers take more risk than banks' managers in the presence of competition. Finally, by including the

quadratic term of competition, we find that there is a non-linear relationship between competition and risk-taking. This study has public policy implications: the American Banking Association argues that public policy toward credit unions and banks should be similar due to their similarities; whereas, credit unions express their difference to protect their privilege of tax exemption.

The third essay attempts to identify certain traits of the target credit unions in comparison to acquiring and non-merging credit unions. The analysis is performed both qualitatively and quantitatively. First, the paper presents a clinical analysis of three cases of mergers of credit unions. Each case is analyzed from the perspective of agency theory to determine the reason for merger. The three cases illustrate how the executives and directors are seeking their own utilities at the expense of the members. Second, we aim to identify certain characteristics of target credit unions empirically by comparing a sample of acquired credit unions to a matched sample of non-merging credit unions and the acquiring credit unions. The sample comprises U.S. credit unions above $10 million in total assets that merged to expand their services between 2011 and 2017. We identified a list of ratios that are used by the NCUA for credit union assessment, a univariate analysis of variance tests for differences between the means of these ratios among the three groups (targets, acquiring, and non-merging credit unions); the means of the ratios of the three groups are statistically different. Then, factor analysis is performed to classify the major factors that explain the majority of variance. Growth, capital adequacy, asset quality, and earnings are the major ratios that differentiate between the target, acquiring, and non-merging credit unions. The paper has public policy implications; it provides the NCUA with the necessary information for the amendment of the voluntary mergers proposed rule on May 25, 2017.

Keywords: Earnings management; Credit unions; Loan loss provision; Agency theory; Banks; Risk-taking; Competition; Lerner Index; Mergers; Target; Voluntary merger; Acquisition; Agency hypothesis.

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To my sunshine, my son, Joseph Sahyoun, I dedicate this dissertation to you.

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Chapter 1: Introduction

Our motivation to study credit unions springs from the practical importance of better understanding this financial sector which provides inexpensive, reliable and beneficial financial services to communities all over the world. According to the world council of credit unions, 89,000 credit unions in 117 countries enhance the lives and communities of 260,000,000 members (https://www.woccu.org/impact/credit_unions). In the United States, for example, 6,100 credit unions in 2015, serve 103.7 million members with a penetration rate of about 48.8% (percentage of credit union members of the active population age between 15 and 64 years), and with total assets of around $1.2 trillion (WOCCU, 2016). Moreover, the importance of credit unions in the U.S. is also reflected in their tax exemption status where earnings are distributed in the form of higher savings returns, lower loan rates, and lower fees to members.

Despite the significant importance of credit unions in the communities, and their high penetration rate of almost 50%, credit unions have been rarely investigated in the academic accounting literature. The lack of focused attention on the financial reporting practices and incentives of such organizations is puzzling considering also their relative importance in the world's financial system. For example, some of the strongest banks in the world are cooperatives or cooperative unions, Desjardins Group in Canada and Norinchukin Bank in Japan ranked among the strongest banks in the world in the 2014 index of the World's Strongest Banks published by Bloomberg.

This dissertation aims to shed some light into three interrelated issues in the realm of credit unions' financial reporting practices in the U.S. The first essay examines the extent of earnings management to avoid reporting earnings declines, and the characteristics of the credit unions that are engaging in earnings management. Theoretically, Rasmusen (1988) and Fama and Jensen (1983a; 1983b) claim that members and boards of cooperatives are less likely to monitor and replace managers than do stockholders and boards of for-profit firms. Therefore, it is assumed that principal-agent problems are more likely to occur due to the lack of member participation in cooperatives. Accordingly, we examine the extent or earnings management from the perspective of the agency problem in credit unions. The second essay examines the difference in risk-taking of credit unions and banks, and whether the presence of competition would affect their risk-taking differently. Credit unions are now perceived as interchangeable to

mainstream financial service providers such as banks (Feinberg, 2001; Feinberg & Rahman, 2001; Hannan, 2003; Schmid, 2005; Tokle & Tokle, 2000), and are aggressively competing with them by being more active on the lending side (Fox, 2018). Accordingly, we show whether the risk-takings are different in the absence and presence of competition. The third essay examines the characteristics of target credit unions in voluntary mergers by comparing targets to acquiring and non-merging credit unions. According to the National Credit Union Administration (NCUA) merger rules, the voluntary merger process is legal, except that it is not transparent to members, especially regarding compensation paid to boards and executives of acquired credit unions. Accordingly, we investigate the motives of management and characteristics of target credit unions.

Altogether, this dissertation investigates important issues related to the financial reporting practices of credit unions. Specifically, the three essays address the following research questions:

1- Do credit union managers engage in earnings management to avoid reporting earnings declines? What are the characteristics of these credit unions and what are their incentives?

2- Is risk-taking in credit unions different from risk-taking in commercial banks? Does competition affect risk-taking in credit unions differently than in commercial banks?

3- What are the characteristics of the target credit unions in comparison to acquiring and non-merging credit unions?

In the first essay, we examine the economic implications of the agency problem between managers and members/owners in credit unions. Unlike banks, which governance system follows closely Jensen and Meckling (1976) shareholder principal-agent perspective; credit unions are characterized by a specific weak governance system among its members, the board of directors and the general manager (Hillier, Hodgson, Stevenson-Clarke, & Lhaopadchan, 2008; Keasey, Thompson, & Wright, 2005). The governance system is weak in both oversight and monitoring since the board of directors consists mainly of volunteer members lacking the necessary skills to manage and monitor the credit union (Hillier et al., 2008). Such governance system allows managers to use their own discretion to manipulate earnings towards their own benefits. Hence, the first essay examines the extent of earnings management to avoid reporting earnings declines, and the characteristics of the credit unions that are engaging in earnings management. Second,

the incentive of the merger that underlies such earnings management is investigated. Results can be summarized in the following fashion. First, credit union managers in the U.S. engage in income smoothing through the discretionary use of loan loss provision to avoid earnings declines. Results also show that larger and better capitalized credit unions engage in more earnings management, as do credit unions with a federal charter; moreover, credit unions with lower profitability engage more in earnings management. Second, concerning management's incentives to engage in earnings management, results show that credit unions engage in earnings management if they have an incentive to acquire another credit union. This study extends the earnings management literature in the financial industry. Prior studies have investigated how bank mangers use their financial reporting discretion as a tool to avoid capital adequacy requirements or to smooth earnings. Moreover, prior studies find that income smoothing is more commonly practiced among publicly traded banks than privately owned ones due to the presence of more external stakeholders in public banks. This study finds that credit unions' managers still engage in earnings management, even if credit unions are not publicly traded, due to the presence of manager- owner agency problem.

In the second essay, we focus on the competition between credit unions and commercial banks. Both types of financial institutions compete in the same markets, and households essentially consider credit unions as an alternative to banks (Anderson & Liu, 2013). Moreover, nowadays, credit unions are aggressively competing with banks by being more active on the lending side; the rise in credit unions' lending activity is exerting competitive pressures upon commercial banks (Fox, 2018). Furthermore, a principal belief about the relationship between bank competition and risk is that as competition increases on banks, they would change their choices of borrowers (Bushman, Hendricks, & Williams, 2016). In this context, this study aims to examine the risk-taking of banks and credit unions, and how competition affects risk-taking, i.e., whether it affects differently credit unions and banks. Three proxies are used for risk-taking: 1) the Z-score, which measures an institution's stability, 2) the ratio of non-performing loans to total loans, and 3) the ratio of loan charge-offs to total loans, which proxy for credit risk. First, univariate analyses are conducted to compare the means of the risk-taking and competition measures of the two types of institutions. Results show that the means of the risk-taking measures and the mean of the firm-specific measure of competition do not differ significantly between credit unions and banks in the sample. Second, examining the difference in the risk-

taking of credit unions and banks in a multivariate analysis, we find that banks' managers engage in riskier activities. Third, also relying on regression analyses, the effect of competition on risk-taking is examined. We find that increased competition induces banks' and credit unions' managers to take more risk. We also find that credit unions' managers take more risk than banks' managers in the presence of competition. Finally, the risk-taking proxy is regressed on the quadratic term of the competition measure to find any possible non-linear relationship between competition and risk. This essay adds to the scant literature on the comparison of risk-taking between credit unions and banks, and extends the literature that considers the competition between credit unions and commercial banks.

In the third essay, we examine the voluntary mergers in credit unions by performing a qualitative and a quantitative analysis. First, the paper presents a clinical analysis of three cases of mergers of credit unions. Each case is analyzed from the perspective of agency theory to determine the reason for merger. The three cases illustrate how the executives and directors are seeking their own utilities at the expense of the members. Second, we aim to identify certain characteristics of target credit unions empirically by comparing a sample of acquired credit unions to a matched sample of non-merging credit unions and the acquiring credit unions. We identified a list of ratios that are used by the NCUA for credit union assessment, a univariate analysis of variance tests for differences between the means of these ratios among the three groups (targets, acquiring, and non-merging credit unions); the means of the ratios of the three groups are statistically different. Then, factor analysis is performed to classify the major factors that explain the majority of variance. Growth, capital adequacy, asset quality, and earnings are the major ratios that differentiate between the target, acquiring, and non-merging credit unions. This essay contributes to the merger literature of credit unions. It provides recent evidence on the latest trend of voluntary mergers that are putting the cooperative principle at risk.

The rest of the dissertation is organized as follows. The next three chapters present the three essays. The fifth chapter covers the conclusion, limitations, and directions for future research.

Chapter 2: Earnings management in U.S. credit unions.

Abstract

Relying on an agency theory perspective, this study examines the extent of earnings management in U.S. credit unions through loan loss provisions (LLP). The context of member-owned credit unions provides a different set of financial reporting incentives than the one typically found in shareholder-owned banks, thus providing an opportunity to extend earnings management research. The sample comprises U.S. credit unions above $50 million in total assets, between 2003 and 2016. Results show that credit union managers engage in income smoothing through the discretionary use of LLP to avoid earnings declines. Results also show that larger and better-capitalized credit unions engage in more earnings management, as do credit unions with a federal charter. Moreover, credit unions are driven by the incentive of merging to engage in earnings management. The findings are economically significant, and thus, relevant to policymakers contemplating new regulations since these managerial activities may place the cooperative principle at risk.

Keywords: Earnings management; credit unions; loan loss provision; agency theory

2.1 Introduction

The U.S. credit union movement is 'to make available to people of small means credit for provident purposes' (Federal Credit Union Act 1934). The first credit union established in the U.S. was in Manchester, New Hampshire, in 1908 (AICPA, 2016; Walter, 2006). Since then, the credit union industry has increased its scale and reach throughout the U.S. At the end of 2016, there were 5,996 credit unions with more than $1.3 trillion of assets serving 108.3 million members, of which, around half are aged between 15 and 64 years (WOCCU, 2016). Although U.S. commercial banks hold more than twelve times in total assets ($14.9 trillion in total assets), credit unions exhibit faster growth than banks (DiSalvo & Johnston, 2017). Moreover, credit unions in the U.S. have granted around $883.76 billion in loans and have $1.107 trillion in savings and shares (WOCCU, 2016), whereas banks have granted around $8.6 trillion in loans and have $12 trillion in total deposits[1].

Credit unions are financial institutions with a special type of ownership since they are owned by their members, otherwise known as a members' mutual or cooperative organization. This type of institutions is characterized by an ethos that focuses on self-help and voluntarism, especially among weaker, disadvantaged segments of society (Goddard, McKillop, & Wilson, 2002). Credit union members act as both suppliers (depositors) and requesters (borrowers) of funds (Maia, Bressan, Lamounier, & Braga, 2013). Within the same credit union, members share common bonds; i.e., members share the same occupation, employer or geographic location. This bond reduces information asymmetry; thus, the credit union can grant a loan to a member based on that person's reputation (Keldon Bauer, 2015; Ward & McKillop, 2005).

However, over time, sharing common bonds has lost importance. Instead, nationwide credit bureaus provide detailed information on the creditworthiness of individuals (Keldon Bauer, 2015). Thus, the relaxation of sharing common bonds as well as larger credit union size, have allowed management's interests to further diverge from members' interests, thereby increasing the separation between both parties. This has led to the evolution of different intentions and strategies; such as increased interest in new opportunities for growth and merger (Goddard et al., 2002), which further induce agency problems. Moreover, Brown and Davis (2009) find that mutual firms have theoretically a high likelihood of seeing management–

[1] The data on banks is from SNL financials database.

stakeholder agency problems arise even though such mutual structure is free of depositor–owner conflicts. Entrenched managers may want to pursue growth, profit, and additional benefits, which are not in the best interests of members/owners. Moreover, Leggett and Strand (2002) claim that as more membership groups and members register in a credit union, agency problems intensify and so managers tend to channel any residual earnings away from members and towards themselves.

Theoretically, Rasmusen (1988) and Fama and Jensen (1983a; 1983b) claim that members and boards of cooperatives are less likely to monitor and replace managers than do stockholders and boards of for-profit firms. Therefore, it is assumed that principal-agent problems are more likely to occur due to the lack of member participation in cooperatives. Credit unions are one type of cooperative financial institutions which operate on the principle of one-member/one-vote in terms of governance rule. However, even if members of the credit union are capable of exercising control through their votes, the existing literature shows that few intend to do so (Van Dalsem, 2017; Wilcox, 2006). Thus, even in the absence of the depositor-owner conflicts, the management-stakeholder agency problem still exists in credit unions.

With the economic implications of agency problems between managers and members/owners potentially rising as credit unions gain in size and scope, the study aims to examine if and how U.S. credit unions' managers take advantage of their situation through the mechanism of earnings management. Healy and Wahlen (1999) define earnings management as it "occurs when managers use judgment in financial reporting and in structuring transactions to alter financial reports to either mislead some stakeholders about the underlying economic performance of the company or to influence contractual outcomes that depend on reported accounting numbers" and this is mainly due to managerial self-interest. For example, managers have the incentive to manipulate earnings if it affects their compensation package (Healy, 1985), they are faced with job security concerns (Kanagaretnam, Lobo, & Mathieu, 2003), they want to issue shares for the first time in the capital market, to avoid violating debt covenants, or reduce regulatory costs (Healy & Wahlen, 1999). Moreover, it is common for banks to manage earnings to meet capital and regulatory requirements (Anne Beatty & Liao, 2014). In the credit union industry, there is scant evidence regarding the use of earnings management to meet capital regulatory requirements, but results are mixed. In Australia, credit unions use accounting

window dressing techniques to manage capital (Hillier et al., 2008), whereas in Brazil credit unions do not manage earnings towards regulatory capital requirement (Maia et al., 2013). On the contrary, Brazilian credit unions manage earnings to avoid reporting losses. Since credit unions follow country-specific regulations, this study aims to detect the extent of US credit unions' agency problems through the mechanism of earnings management. First, we examine the extent of earnings management to avoid reporting earnings declines, and the characteristics of the credit unions that are engaging in earnings management. Second, the incentive of merger that underlies such earnings management is investigated.

The sample consists of 83,634 credit union-quarterly observations over the period 2003–2016. Similar to banks, the loan loss provision (*LLP*) is the largest accrual in credit unions and managers have wide latitude for discretion in its estimation; therefore, the use of *LLP* as a proxy for earnings management will be examined. Following prior research, abnormal loan loss provision (*DLLP*) is estimated as the residual of the regression of *LLP* on beginning loan loss allowance, total loans outstanding, changes in total loans outstanding, net loan charge-offs, beginning balance of non-performing loans, change in non-performing loans, loan mix, and controls for quarters. Next, a regression of abnormal *LLP* on earnings, change in earnings, and other variables that proxy for credit union characteristics is performed. Results can be summarized in the following fashion. First, credit union managers in the U.S. engage in income smoothing through the discretionary use of *LLP* to avoid earnings declines. Results also show that larger and better capitalized credit unions engage in more earnings management, as do credit unions with a federal charter; moreover, credit unions with lower profitability engage more in earnings management. Second, with respect to management's incentives to engage in earnings management, results show that credit union engage in earnings management if they have an incentive to acquire another credit union. Hence, acquiring credit unions after 2009 engage more in earnings management than non-merging credit unions. Even though it is evident in both large and small credit unions, it is more significant in large credit unions where management is seeking growth through mergers.

This study contributes to the literature in several ways. First, this study extends the existing literature on earnings management. Several prior studies analyze earnings management in firms in its different forms, more specifically the real earnings management (Graham, Harvey,

& Rajgopal, 2005; Roychowdhury, 2006; Wang & D'Souza, 2006; Xu & Taylor, 2007) and accrual-based earnings management (Dechow & Skinner, 2000; Fields, Lys, & Vincent, 2001; Healy & Wahlen, 1999). Moreover, earnings management in banks has been explored extensively in the U.S. (Barth, Gomez-Biscarri, Kasznik, & López-Espinosa, 2017; Kanagaretnam, Lobo, & Mathieu, 2004; Kanagaretnam, Lobo, & Mathieu, 2003; Beatty, Ke, & Petroni, 2002), and on an international basis (Anandarajan, Hasan, & Lozano-Vivas, 2003; Anandarajan, Hasan, & McCarthy, 2007; Fonseca & González, 2008). However, similar attention has not been given to alternative organizational forms, such as credit unions. The lack of focused attention on the financial reporting practices and incentives of organizations such as credit unions is puzzling considering their relative importance in the world's financial system. For example, some of the strongest banks in the world are actually cooperatives or cooperative unions; Desjardins Group in Canada and Norinchukin Bank in Japan ranked among the strongest banks in the world in the 2014 index of the World's Strongest Banks published by Bloomberg. Few studies examine earnings management activities in credit unions. For instance, Maia et al (2013) find that the Brazilian credit unions do not manage their earnings towards regulatory capital adequacy, rather they engage in income smoothing and earnings management to avoid reporting losses. In contrast, Australian credit unions' management increases capital adequacy ratios by practicing accounting window dressing techniques (Hillier et al., 2008). Moreover, credit unions are common and active over several countries, but they operate differently according to the country's regulations (K. Davis, 2005). Therefore, this study is the first, to my knowledge, that examines earnings management in U.S. credit unions.

Second, this study contributes to the growing literature on credit unions. More specifically, this study sheds light on the governance of credit unions. Unlike banks, which governance system follows closely Jensen and Meckling (1976) shareholder principal-agent perspective, credit unions are characterized by a specific weak governance system among its members, the board of directors and the general manager (Hillier et al., 2008; Keasey et al., 2005). The governance system is weak in both oversight and monitoring since the board of directors consists mainly of volunteer members lacking the necessary skills to manage and monitor the credit union (Hillier et al., 2008). Moreover, Wilcox (2006) claim that the interests of managers and members of mutuals are not aligned and that the governance of mutuals is ineffective as it is more or less held by a set of entrenched managers (Akella & Greenbaum,

1988; Wilcox, 2006). Such governance system allows managers to use their own discretion to manipulate earnings towards their own benefits.

Third, this study contributes to regulators and standard setters in the United States. Federally chartered credit unions are supervised by the National Credit Union Agency (NCUA), which also manages the National Credit Union Share Insurance Fund (NCUSIF). The NCUSIF is responsible for providing share insurance to all federal credit unions and federally insured, state-chartered credit unions, and assuring that each union deposits up to a certain threshold. Despite all the rules and regulations; this study shows that management, coupled with a weak governance system, is compromising its fiduciary responsibilities by taking accounting choices to report earnings that look better for its own interest at the expense of members. This behavior from the management side would put the cooperative principle at risk.

The remainder of the paper proceeds as follows: the next section provides institutional background information and reviews the relevant literature. Section 3 provides the theoretical framework and develops the hypothesis. Section 4 details the sample selection and describes the research design including the empirical model. Section 5 discusses the empirical results. Finally, section 6 concludes the paper.

2.2 Institutional background:

2.2.1 Development of credit unions

"A credit union is a customer/member-owned financial cooperative, democratically controlled by its members, and operated for the purpose of maximizing the economic benefit of its members by providing financial services at competitive and fair rates" (World Council of Credit Unions [WOCCU], 2017). Even though they are not part of mainstream financial institutions, credit unions still play a significant role in the financial industry. This is shown by their substantial memberships across the world and in many developed and developing countries. According to the WOCCU 2015 statistical report, around 60,500 credit unions worldwide serve 223 million people (WOCCU, 2016).

In the United States, the credit union movement was initiated in order 'to make available to people of small means credit for provident purposes' (Federal Credit Union Act 1934). The

first established credit union in the United States was St. Mary's Cooperative Credit Association, which was chartered in Manchester, New Hampshire, in 1908 (NCUA, 2006; Walter, 2006; AICPA, 2016). At that time, banks and savings institutions did not provide small and unsecured loans to cover for small payments, such as medical bills or purchase of home appliances. Thus, credit unions were initiated to fill this need (Walter, 2006). However, credit unions in the U.S. have drastically progressed compared to similar institutions across the world; making this industry reach a final and highly successful developed stage (Ryder, 2005; Ryder & Chambers, 2009). Thus, even though credit unions are not considered the main contributor to the U.S. financial industry, their shares and importance in the U.S. financial market cannot be devalued (Keldon Bauer, 2008). Moreover, the relaxation of sharing a common bond, which was once a primary restriction, helped ease the growth of credit unions through the attraction of more members (Goddard et al., 2002). The number of credit unions in the U.S. reached 6,100 credit unions in 2015, serving 103.7 million members with a penetration rate of about 48.8% (percentage of credit union members of the active population age between 15 and 64 years), and with total assets of around $1.2 trillion (WOCCU, 2016).

2.2.2 Regulation and governance of credit unions

According to the AICPA Guide (2016), credit unions are supervised and regulated by either a federal or a state charter with periodic examinations by the corresponding supervisory agency examiners. On the one hand, the National Credit Union Agency (NCUA) supervises federally chartered credit unions. The NCUA also administers the National Credit Union Share Insurance Fund (NCUSIF), which provides share insurance to all federally chartered credit unions and federally insured, state-chartered credit unions, and assures that each has a minimum amount of deposit. On the other hand, state-chartered credit unions are supervised by the regulatory agency of the chartering state. In general, most state-chartered credit unions are required to obtain share insurance provided by the NCUSIF, but it is also acceptable to obtain insurance from other private insurance sources, depending on state laws. However, insurance coverage is obligatory for all credit unions (Goddard et al., 2002). In addition to the insurance requirement, all credit unions with at least $10 million of assets must submit their reports and financial statements in accordance with the U.S. generally accepted accounting principles (GAAP) to the NCUA board (AICPA, 2016).

Credit unions, considered as member-owned democratic institutions, intend to voluntarily support the weaker segments of society. They provide various social, educational and developmental activities. Due to their unique nature, credit unions are treated differently from banks (Goddard et al., 2002). For instance, credit unions enjoy a tax-exemption. Moreover, credit unions are characterized by a different type of ownership. Owners of credit unions are the members themselves who are exposed to equal rights for voting and decision-making irrespective of the size of the deposits paid (Goddard et al., 2002). Therefore, each credit union member has the right to one vote at the annual general meeting to elect the board of directors (Mook, Maiorano, & Quarter, 2015). In return, board members elect members/owners to take part in the committees to form the governance system of the credit union (AICPA, 2016; Mook et al., 2015).

The elected board members are usually volunteers whose primary responsibility is to establish the general operation and ensure that it abides by all laws and regulations (AICPA, 2016). They ensure that the credit union is financially stable while maintaining management integrity (AICPA, 2016). Therefore, for the credit union to satisfy its objectives to meet the needs of its members, any surplus or profit generated at the end of the year should be re-invested in better services or distributed as dividends to the members. However, the form of dividends in a credit union is based on patronage or service use, which is different from the concept of dividend distribution to shareholders following their investments in stock-based corporations (McKillop & Wilson, 2011).

2.2.3 How are credit unions different from banks?

In 2001, the United States Department of Treasury[2] identified five characteristics that differentiate credit unions from banks. First, credit unions are owned by their members. Each member is eligible to one vote in selecting the board of directors or other important decisions, irrespective of the size of the member's deposit. Second, credit unions cannot raise capital through the stock market; however, the capital is created from retained earnings. Third, boards of directors of credit unions are composed of unpaid volunteer members. Fourth, credit unions operate as not-for-profit financial institutions; therefore, all profits are retained as capital, or

[2] U.S. Department of the Treasury "*Comparing Credit Unions and Other Depository Institutions",* January 2001.

distributed to the members as a dividend in the form of lower interest rates on loans and higher interest rates on deposits. Fifth, credit unions members share a common bond identified in the field of membership. These members can share the same occupation, the same employer or live in the same geographic location.

Despite these differences between credit unions and other types of financial institutions, credit unions are similar to other financial institutions regarding the service they provide (lender and depositor services), and they compete in the same market. Moreover, similar to other types of financial institutions, the credit unions follow the same financial reporting standards and abide by the same set of acts and regulations.

2.2.4 Related research on earnings management in banks

Earnings management in financial institutions is another avenue related to this study. While the literature has extensively discussed earnings management in banks, few have performed in-depth research on earnings management in credit unions. In this section, the literature is briefly reviewed, emphasizing recent work that is most closely related to this study.

Extant literature focuses on earnings management in banks, mostly with respect to the different managerial incentives and methods used to manage earnings. Earnings manipulation ranges from income smoothing, to beating a specific benchmark, or further to maximize earnings. In addition to earnings management, regulations imposed on banks motivate managers to perform regulatory capital management. Thus, the debate about banks' earnings management is mostly as to whether their financial reporting discretion is used as a tool to avoid capital adequacy requirements or to smooth earnings.

There are several methods to manipulate earnings or capital (Beatty & Liao, 2014). However, the most common and largest bank accrual used to smooth earnings is the loan loss provision. There is a broad consensus within the literature, conducted on both U.S. and non-U.S. data, on the income smoothing hypothesis which claims that the level of loan loss provision and bank earnings are positively related (Anandarajan et al., 2007; Fonseca & González, 2008; Kanagaretnam et al., 2003; Kanagaretnam et al., 2004). Nevertheless, few papers refute this association (Ahmed, Takeda, & Thomas, 1999; Collins, Shackelford, & Wahlen, 1995; Anne Beatty, Chamberlain, & Magliolo, 1995). Moreover, managers also take advantage of the

recognition of gains and losses from securities' sales (Barth, Gomez-Biscarri, Kasznik, & López-Espinosa, 2017; Beatty & Harris, 1999) and the one-time accounting change in post-retirement benefits (Ramesh & Revsine, 2000) as means to manipulate earnings.

Another area of investigation is the difference in earnings management techniques between publicly-traded and privately-held banks. For example, in a U.S. context, Beatty and Harris (1999) and Beatty et al. (2002) find that income smoothing is more commonly practiced among publicly traded banks than privately owned ones. This practice is more common due to the presence of more external stakeholders in public banks compared to private banks. External stakeholders rely more on earnings announcements and financial statements. This leads us to infer that accounting information has a signaling effect; and earnings manipulation is used for signaling to external stakeholders. Moreover, the presence of uninformed shareholders about the trading costs in public banks incentivize managers to engage in income smoothing (Fonseca & González, 2008).

2.3 Theory and hypothesis development

2.3.1 Agency problem and earnings management

A vast literature compares the advantages of a mutual organizational form in contrast to a joint-stock form (Baker & Thompson, 2000; K. Davis, 2005; Hansmann Henry, 1996; Wilcox, 2006). One of the main differences between both organizational forms is the nature of the agency problem (K. Davis, 2005). For instance, the mutual form reduces the extent of the agency problem between owners and customers; in contrast, the mutual form aggravates the agency problem between owners and managers. More specifically, in credit unions, the agency problem arises from self-serving and entrenched managers engaging in activities that serve their interest and do not serve the interest of owners (Wilcox, 2006). Owners/members with unclear and weak property rights typically have no intention, and no clear incentive, to monitor and discipline the entrenched managers (K. Davis, 2005). As a result, the agency problem will increase in these credit unions. Another factor that contributes to the aggravation of the agency problem in credit unions is the acceptance of the Credit Union Membership Access Act (CUMAA) in 1998. The act grants credit union members the freedom to transfer their deposits to other credit unions within the same geographical area (Van Dalsem, 2017). Thus, owners/members prefer to shift

their membership to other credit unions rather than participate in the governance of their original credit union (Hoel, 2011); as a consequence, the relationship between management and owners/members is weakened.

Moreover, Davis (2005) discusses the intensity of the owner-manager agency problem with the development of the credit union: when the credit union is newly formed, the operational and strategic goals are limited, and both board members and managers share similar duties and expertise; as a result, the owner-manager agency problem may not be considered severe. As the credit union grows and reaches maturity, more ambitious strategic goals will be set (e.g. expansion in new areas, exploration of new opportunities, or development of the range of financial services). To achieve these goals, credit unions seek professional management whose personal goals may be superior to the goals of the members/owners, and as a result intensify the severity of the agency problem. For instance, on a personal level, managers may have the ambition to increase a credit union's size for reasons of economies of scale (Keldon J. Bauer, Miles, & Nishikawa, 2009).

In brief, a credit union is a particular type of financial institution which differs in its ownership and governance structures, as well as in the owner-manager agency problem. Mutuals, unlike public banks, do not have the pressure from stock market investors to constantly report earnings with an increasing trend. However, they have the incentive to please their members/owners. Members/owners benefit from cash distributions if a credit union reports positive earnings. To report positive earnings, pressure is placed on managers to put in full efficiency and limit their ambitions (Maia et al., 2013). On the contrary, negative returns signal a poor financial performance that puts the credit union at risk of failure, and managers would face a bad reputation and job loss (Hillier et al., 2008). As a result, managers are likely to seek means to ensure the institution's continuity to save their jobs and/or access to perks (K. Davis, 2005; Wilcox, 2006) by hiding poor performance (Frame, Karels, & McClatchey, 2002; Hillier et al., 2008). Dechow and Skinner (2000) state that managers opportunistically delay reporting poor performance by avoiding reporting losses and earnings declines. Therefore, it is anticipated that credit union managers use their discretion and engage in earnings management to avoid reporting earnings declines in order to achieve their personal goals. If income before the loan loss provision increases, then we expect that managers increase the discretionary loan loss provision;

thus they engage in income decreasing earnings management. And, if income before the loan loss provision decreases, then we expect that managers decrease the discretionary loan loss provision; thus they engage in income increasing earnings management. The first hypothesis is the following:

Hypothesis 1 (H_1): ***Management engages in earnings management to avoid earnings decline.***

2.3.2 Credit union characteristics and earnings management

This section investigates the characteristics of the credit unions engaging in earnings management. Existing academic literature finds that credit unions' behavior differs across age, size, growth, and profitability (C. Brown & Davis, 2009; Forker & Ward, 2012; Goddard, McKillop, & Wilson, 2008). Unlike public firms[3], the credit union size captures economies of scale effects (Ward & McKillop, 2005). Larger credit unions experience economies of scale (McKillop, Ferguson, & Goth, 2006) and can afford to employ trained and professional managers (Ward & McKillop, 2005). However, management-owner agency problem is higher in the presence of professional management who seek more personal goals at the expense of members' interests (Keldon J. Bauer et al., 2009). As a result, the agency problem increases with credit union size. Therefore, the study expects earnings management to increase as the size of the credit union increases.

Hypothesis 2a (H_2a): ***Credit unions exhibiting larger size engage more in earnings management.***

Profitability is considered a determinant of the institution's financial health. Rasiah (2010) classified the profitability indicators of commercial banks into two main categories: internal and external determinants. The internal determinants consist of management controllable factors such as liquidity, investment in securities, investment in subsidiaries, loans, non-performing loans, and overhead expenditure. On the other hand, external determinants are those that cannot be controlled by management such as interest rates, inflation rates, market growth

[3] The evidence on the effect of size on earnings management is inconclusive: On one hand, Watts and Zimmerman (1990) claim that larger companies are more likely to engage in income-decreasing earnings management. On the other hand, Richardson (2000) indicates that larger firms are more likely to perform income-increasing earnings management practices since they are faced with market pressure from their investors.

and market share. Similar to banks, credit unions' management can use its discretion in granting loans and estimating loan losses. Therefore, profitability is inversely related to discretionary loan loss provision.

Hypothesis 2b (H_2b): ***Credit unions with lower profitability engage more in earnings management.***

Credit unions have limited access to external capital equity. Unlike banks, to accumulate capital, credit unions can only rely on retained earnings. For example, a large amount of loan losses can cause the net worth to fall below regulatory requirements (Wilcox, 2002). Holding enough reserves signifies that members' deposits are safe and that sufficient liquid assets are available to ensure the ability of non-current asset purchases later when needed (C. Brown & Davis, 2009; K. Davis, 2001). However, holding excess reserves may indicate that a credit union is being risk-averse and missing some investment opportunities that may have profited the credit union with large positive returns (Berger, 1995; Goddard et al., 2008). On the other hand, other evidence shows that high level of reserves would be favorable to future members through free riding activity at the expense of current members (Emmons & Mueller, 1997; Forker & Ward, 2012; Hart & Moore, 1996). According to the signaling hypothesis, managers may be aware of the future financial situation of the institution; thus, it is less costly for managers to indicate growth through capital-assets ratio (Goddard et al., 2008) and as net worth increases, managers can take more risk (Goddard et al., 2002). Therefore, as net worth increases, managers are more likely to use their discretion in estimating loan loss provision:

Hypothesis 2c (H_2c): ***Credit unions exhibiting higher net worth engage more in earnings management.***

Moreover, regulatory bodies discipline the behavior of credit unions' managers. Credit unions can be either federal or state chartered. A state-chartered credit union follows the laws of the state that governs it; while federal-chartered credit unions are controlled by the National Credit Union Agency at the federal level. Reichert and Rubens (1994) claim that state regulations are more lenient than federal regulations. Accordingly, state-chartered credit unions are expected to take advantage of their liberal status and engage in more risky activities. Moreover, Wolken and Navratil (1985) find that credit unions would choose to be state-chartered

rather than federal-chartered if they were in states with more liberal regulation. On the contrary, recent studies (Ayers, Ramalingegowda, & Yeung, 2011; Kedia & Rajgopal, 2011) stress the importance of the geographic distance between the firm and the regulator. The proximity of the regulator to the firm has a monitoring role and disciplines the managers. For example, Kedia and Rajgopal (2011) find that firms closer to the SEC offices are less likely to restate their financial statements. In the same token, state-chartered credit unions are closer to their regulator, the state, than federal-chartered credit unions. Therefore, we expect that the management of state-chartered credit unions is monitored and disciplined more than federal-chartered credit unions. As a result, I expect state-chartered credit unions would engage in fewer earnings management activities than the federal-chartered credit unions.

Hypothesis 2d (H_2d): ***State-chartered credit unions engage less in earnings management.***

2.3.3 Management incentives and earnings management

More recently, the agency problem in credit unions is exacerbating which is placing the cooperative model at risk. This is apparent from the managed sales of credit unions (CreditUnions.com, 2017) and the inherent demutualization bias (Davis, 2005). Contributing factors include the emergence of professional management pursuing personal objectives, together with the economic realities of technological change, financial liberalization, increased competition, and prudential regulation based on minimum capital requirements. While takeovers or demutualization processes look good and proper on paper, the whole process is designed to keep members in the dark; and is based on wealth expropriation motives (Davis, 2005). Examining a list of acquirers compared to non-merging credit unions, this study predicts that management would engage in earnings management if they have an incentive to participate in a merger.

Hypothesis 3 (H_3): ***Management engage in earnings management if they have an incentive to participate in a merger.***

2.4 Empirical design

2.4.1 Data

The data set is constructed from financial information published by U.S. credit unions in their '5300 Call Reports' and made available by SNL Financials. The initial sample (Table 1) consists of all credit union quarterly observations available on SNL Financials from the first quarter of 2003 until the fourth quarter of 2016. The start date is 2003, the time when SNL started to gather complete quarterly data for all credit unions; and the Credit Union Membership Access Act was effective. Moreover, in the early stages of credit union development where board and management responsibilities and expertise may overlap, owner-management agency problems may not be severe (K. Davis, 2005); therefore, new credit unions are dropped from the sample. According to AICPA (2016), a credit union is designated as "new" if it has been in existence for less than ten years and has $10 million or less in total assets. Also, federal credit unions with at least $10 million in assets must submit their financial reports in accordance with GAAP; as a result, all credit unions with less than $10 million in assets are dropped. Besides, credit unions with total assets greater than $50 million are considered large and sophisticated (AICPA, 2016); large credit unions are considered as bank competitors and operate similarly to banks; credit unions with total assets less than $50 million are dropped from the sample.

[INSERT TABLE 1 ABOUT HERE]

The final sample consists of 1,537 credit unions; the equivalent of 86,072 credit union-quarter observations. Observations with extreme or non-sensical values for specific variables are eliminated from the sample. The final sample size is 83,634 credit union-quarter observations.

[INSERT TABLE 2 ABOUT HERE]

2.4.2 Empirical model

The first part of the study examines the earnings management activities in credit unions. In general, the allowance for loan losses and the loan loss provision are significant to financial institutions' financial statements; the estimation of these accounts is subject to high degrees of subjectivity (AICPA, 2016). Moreover, research has shown that bank managers use their discretion in meeting their goals (Wall & Koch, 2000) and the largest bank accrual that managers

use to manipulate earnings is the loan loss provision (Anne Beatty & Liao, 2014). Similar to banks, the loan loss provision (*LLP*) is the largest accrual in credit unions, and managers use their discretion in estimating it; therefore, the use of *LLP* as a proxy for earnings management will be examined.

Similar to prior studies, a two-stage approach to examine the relation between *LLP* and earnings is used. *LLP* is composed of two parts: the nondiscretionary and the discretionary components. The discretionary component is subject to management's control. Therefore it is the crucial variable in this study and its relation to earnings needs to be examined.

Consistent with prior research (Beaver & Engel, 1996; Kanagaretnam et al., 2003; Kanagaretnam et al., 2004; Kim & Kross, 1998; Wahlen, 1994), the normal or nondiscretionary component of *LLP* is estimated by regressing *LLP* on beginning loan loss allowance, beginning non-performing loans, change in non-performing loans, net loan charge-offs, total loans outstanding, change in total loans outstanding, loan mix, and controls for quarter effects using the following model (all variables are scaled by beginning total assets)[4]:

$$\begin{aligned} LLP_{ijt} = {} & \alpha_0 + \alpha_1 BEGLLA_{ijt} + \alpha_2 BEGNPL_{ijt} + \alpha_3 \Delta NPL_{ijt} + \alpha_4 NLCO_{ijt} + \alpha_5 LOANS_{ijt} \\ & + \alpha_6 \Delta LOANS_{ijt} + \alpha_7 \Delta lnGDP_{jt} + \alpha_8 \Delta Unemployment_{jt} \\ & + LOANCATEGORIES_{ijt} + QUARTERCONTROLS + \varepsilon \end{aligned} \tag{1}$$

Where i is the credit union at time t in state j, and the variables are defined as follows:

LLP	=	provision for loan losses;
BEGLLA	=	beginning loan loss allowance;
BEGNPL	=	beginning non-performing loans;
ΔNPL	=	change in non-performing loans;
NLCO	=	net loan charge-offs;
LOANS	=	total loans outstanding; and
ΔLOANS	=	change in total loans outstanding;
LOANCATEGORIES	=	amount of all unsecured loans (UnsecLoans), car loans (CarLoans), real estate loans (RealEstateLoans), and all other loans to members (OtherLoans).
Δ lnGDP	=	change in natural logarithm of Gross Domestic Product at the state level;
ΔUnemployment	=	change in unemployment at the state level;

[4] As a further analysis, all the variables are scaled by beginning total loans, and results are similar.

The residuals from model (1) are the abnormal or discretionary component of *LLP*, referred to as *DLLP*. Consistent with prior research, α1, the coefficient of *BEGLLA* is expected to be negative since a higher initial loan loss allowance will require a lower *LLP* in the current period; *BEGLLA* is equal to accumulated *LLP* less write-offs at the beginning of the quarter. α_2, α_3, α_4, and α_5 are expected to be positive for the following reasons: Higher levels of non-performing loans indicate that problems with the loan portfolio will require higher loss provisions; an increase in non-performing loans will require a higher loan loss provision in the current period; current loan charge-offs can provide information about future loan charge-offs, they can influence expectations of the collectability of current loans and hence current *LLP* (Beaver & Engel, 1996). The level of loans (*LOANS*) is expected to be positively related to *LLP* because a higher level of loans will also require higher provisions. The effect of a change in total loans (*ΔLOANS*) on *LLP* depends on the quality of incremental loans; therefore, no prediction for α6. Regarding the economic variables, the change in the natural logarithm of real per capita GDP is included to control for the change in economic growth. In good times, firms will borrow more. Therefore, credit unions will increase *LLP* to account for the additional risk. Thus, the coefficient of Δ*lnGDP*, α_7, is expected to be positive. ΔUnemployment also controls for the economic condition for the region where the credit union operates. As unemployment increases, credit unions will increase *LLP* to account for the risk of default of unemployed members. The coefficient of Δ*Unemployment*, α_8, is expected to be positive. The expected sign of each variable of model 1 is tabulated in Table 6.

Moreover, financial institutions' estimation of credit losses is influenced by the loan portfolio composition and the loan administration procedures (AICPA, 2016). The loan composition is used as a measure of risk in addition to non-performing loans and loan charge-offs. For example, Kanagaretnam, Krishnan, and Lobo (2010) show that banks with a higher proportion of real estate loans are likely to have higher loan loss provisions. The loan portfolio composition variables included in this model are all unsecured loans (*UnsecLoans*) which include unsecured credit card loans and all other unsecured loans; car loans (*CarLoans*) which include new and used vehicle loans; real estate loans (*RealEstateLoans*) which include 1st mortgage and other real estate loans; and other loans (*OtherLoans*) which include payday alternative loans for federal credit unions only, non-federally guaranteed student loans, leases

receivable, and all other loans and lines of credit to members. Quarter-indicator variables, representing quarters of study, control for period-specific effects in model (1).

In the second stage of the analysis, the residual from the first stage regression, representing the discretionary portion of *LLP*, is then used as the dependent variable. To measure whether managers engage in earnings management to avoid earnings declines, the following model is developed:

$$DLLP_{it} = \beta_0 + \beta_1 EBLLP_{it} + \beta_2 \Delta EBLLP_{it} + \beta_3 lnTA_{it} + \beta_4 \Delta lnTA_{it} + \beta_5 ROAA_{it} + \beta_6 NW_{it} + \beta_7 Stat + \beta_8 Pop\_density_{jt} + \beta_9 Educ\_att_{jt} + \nu \quad (2)$$

Where i is the credit union at time t in state j, and the variables are defined as follows:

DLLP	=	abnormal loan loss provision (the residual from model (1));
EBLLP	=	earnings before *LLP*;
ΔEBLLP	=	change in earnings before *LLP*;
lnTA	=	natural logarithm of total assets;
ΔlnTA	=	change in *lnA*;
ROAA	=	Return on Average Assets;
NW	=	ratio of net worth to total assets;
Stat	=	1 for state-chartered, 0 for federally chartered credit unions;
Pop_density	=	Population density at the state level;
Educ_att	=	Educational attainment, ratio of people with a bachelor degree or higher at the state level.

EBLLP and *ΔEBLLP* are the most interesting variables in this study; they measure earnings management and whether credit union managers engage in earnings management to avoid earnings declines. The coefficients of *EBLLP* and *ΔEBLLP* are used to test the first hypothesis. If the sign of β_1, the coefficient of *EBLLP*, is positive, then credit unions use provisions to smooth earnings. According to the income smoothing hypothesis, financial institutions should decrease (increase) *LLP* when earnings are expected to be low (high). *EBLLP* is scaled by beginning total loans, as in Kanagaretnam et al. (2010). Moreover, the first hypothesis also examines whether credit union managers engage in earnings management to avoid earnings declines, β_2, the coefficient of *ΔEBLLP* is the variable of interest. Similar to Beatty et al. (2002), managers use the loan loss provision to eliminate declines in earnings; i.e. financial institutions should decrease (increase) *LLP* when earnings are declining (increasing). Therefore, β2 is expected to be positive. *ΔEBLLP* is also scaled by beginning total loans.

Moreover, model (2) includes several independent regressors that test the second hypothesis. Previous literature typically finds that credit unions behaviors differ across age, size, growth, and profitability; *lnA*, and *ROAA* proxy for size, growth, and profitability, respectively. According to the analysis of hypothesis H2: larger credit unions engage more in earnings management, the coefficient of *lnA*, β_3 is expected to be positive. Less profitable credit unions engage more in earnings management; the sign of the coefficient of *ROAA*, β_5, is expected to be negative. And, credit unions with higher net worth engage more in earnings management; the coefficient of net worth ratio, β_6, is expected to be positive. Moreover, we control for the growth of the credit union by the variable *ΔlnTA*. Governance data for credit unions is not available; therefore, the proxy for regulatory body, *Stat*, and the economic variables, *Pop_density* and *Educ_att*, are used as indirect proxies for oversight. State-chartered credit unions are expected to engage less in earnings management than federal-chartered credit unions; the coefficient of *Stat*, β_7, is expected to be negative. Moreover, as the population density and the percentage of educated people increase, then the oversight on the credit union management increases which limits their discretionary behavior. Therefore, I expect that the coefficients of *Pop_density* and *Educ_att*, β_8 and β_9, to be negative.

The third hypothesis examines whether mergers is an incentive for acquiring credit unions' managers to engage in earnings management. To test the third hypothesis, the following model is developed:

$$DLLP_{it} = \beta_0 + \beta_1 EBLLP_{it} + \beta_2 Merge + \beta_3 EBLLP_{it} * Merge + \beta_4 lnA_{it} + \beta_5 \Delta lnA_{it} + \beta_6 ROA_{it} + \beta_7 NW_{it} + \beta_8 Stat + \beta_9 Pop\_density_{jt} + \beta_{10} Educ\_att_{jt} + \nu \quad (3)$$

Merge is a dummy variable taking the value of one for credit unions that engaged in a merger after 2008[5] and 0 otherwise. The variable of interest in Model 3 is the interaction term between *Merge* and *EBLLP* (*EBLLP*Merge*). If the incentive of managers to engage in earnings management is mergers, then the coefficient of *EBLLP*Merge*, β_3, is expected to be positive.

[5] Credit unions specify in their call report whether they completed a merger or acquisition that qualifies for Business Combination Accounting on or after January 1, 2009.

2.5 Results

2.5.1 Descriptive statistics

In the analysis, the sample is divided into two categories according to their size in total assets. The first category, 'Large,' includes all credit unions with total assets greater than $500 million. Credit unions with total assets greater than $500 million should have an independent auditor and apply generally accepted auditing standards (GAAS). The second category, 'Small,' consists of the credit unions whose total assets at the fourth quarter of 2016 is less than $500 million. Table 3Table 3 divides the credit unions and quarterly observations by charter type and by size categories.

[INSERT TABLE 3 ABOUT HERE]

Table 4 presents the summary statistics of the scaled variables used in models 1 and 2. The table provides the descriptive statistics of the whole sample, and the descriptive statistics of each size category in the study. The mean (median) size of a credit union in this study measured by total assets is $248 million, i.e. $lnTA$ = 19.33 ($205 million, i.e. $lnTA$ = 19.14), with the smallest credit union having $50.6 million ($lnTA$ = 17.74) and the largest $25 billion ($lnTA$ = 23.94). The credit unions have a mean (median) quarterly growth rate of total assets of 1.39% (1.06%) and they have an average (median) return on assets and net worth ratio of 0.60% (0.63%) and 10.97% (10.4%) respectively. The mean of the *DLLP* is 0.0000 which is by construction; the median is also -0.00002 meaning that half of the credit unions engage in income-increasing *LLP* (negative *DLLP*) and the other half engage in income-decreasing (positive *DLLP*). Around 52% of the credit unions in the sample are state-chartered.

As for the group categories, the category of large credit unions has an average (median) return on assets and net worth ratio of 0.77% (0.8%) and 10.59% (10.2%), respectively; whereas the category of small credit unions have an average (median) return on assets and net worth ratio of 0.52% (0.54%) and 11.16% (10.54%) respectively.

[INSERT TABLE 4 ABOUT HERE]

Table 5 reports correlations for the scaled dependent and independent variables used in models 1 and 2. The lower part is the Pearson's correlation matrix, and the upper part of the table

is the Spearmen's correlation matrix. *LLP* is positively correlated with beginning loan loss allowance (*BEGLLA*), beginning non-performing loans (BEGNPL), change in non-performing loans (*ΔNPL*), net loan charge-offs (*NLCO*), and loans outstanding (LOANS). Moreover, *DLLP* is positively correlated to earnings (*EBLLP*), change in earnings (*ΔEBLLP*), size (*lnTA*) and net worth (*NW*); and negatively correlated to growth (*ΔlnTA*) and profitability (*ROAA*).

[INSERT TABLE 5 ABOUT HERE]

The next section analyzes the research question in a multivariate framework to provide more reliable evidence.

2.5.2 Estimation of discretionary LLP

Model (1) is used to estimate the discretionary component of the loan loss provision. The error term of model (1) is the *DLLP*. A panel data set of credit unions over time (quarters) is used to control for any unobservable effects. The Hausman test determines whether to use fixed or random effect. The results of the Hausman test are significant; therefore, the fixed effect model is used. A Hausman test is performed on the whole dataset and on the subsets which are divided according to the size categories, and the results are all significant.

Table 6 reports the estimation results of model (1). The coefficients of the determinants of LLP have the expected sign and are significant at the 1% level. The explanatory power of the model is high (adjR^2 = 50.8%), the model describes the variation in *LLP* well.

[INSERT TABLE 6 ABOUT HERE]

2.5.3 Earnings management to avoid earnings declines

First, a univariate test is employed, the test compares the *DLLP* and *EBLLP* of credit unions that witness earnings declines to those that witnessed earnings increases. Similar to Beatty et al. (2002), to avoid reporting earnings declines, I expect credit union managers to underestimate the discretionary part of loan loss provision. Therefore, *DLLP* is expected to be negative if *ΔEBLLP* is negative and vice versa.

Table 7 presents the results of the univariate tests. The table shows summary statistics on one subsample of credit unions that have a negative change in *EBLLP* and another subsample of

credit unions that have a positive change in *EBLLP*. Credit unions with a negative earnings change engage in negative *DLLP* (income increasing), the mean is -0.0000389. Credit unions with a positive earnings change engage in positive *DLLP* (income decreasing), the mean is 0.0000364. The difference of the means of the two subsamples is significant at the 1 percent level for the two-tailed t-test. Then the sample is divided according to the size categories. Large credit unions with a negative earnings change engage in negative *DLLP*, the mean is -0.0000386; and large credit unions with a positive earnings change engage in positive *DLLP*, the mean is 0.0000351. The difference of the means of the two subsamples is significant at the 1 percent level for the two-tailed t-test. Small credit unions with a negative earnings change engage in negative *DLLP*, the mean is -0.0000379; and small credit unions with a positive earnings change engage in positive *DLLP*, the mean is 0.0000361. The difference of the means of the two subsamples is significant at the 1 percent level for the two-tailed t-test.

[INSERT TABLE 7 ABOUT HERE]

For the multivariate analysis, an OLS regression is used for model (2) using the error term of model (1) as the dependent variable. Depending on the magnitude and sign of the coefficient of *EBLLP*, this indicates whether credit union managers use their discretion in estimating loan loss provision to manage earnings; and the magnitude and sign of the coefficient of *ΔEBLLP* indicates whether credit union managers manage earnings to avoid reporting earnings declines. The results of model (2) are reported in Table 8. The positive and significant coefficient of *EBLLP* (0.19154, p-value<0.01) in table 8 indicates that credit union managers are engaging in income smoothing, which is a form of earnings management. The coefficient of the ΔEBLLP (0.00865, p-value<0.01) is positive and significant at the 1 percent level. Therefore, credit union managers engage in income smoothing to avoid reporting earnings declines. The explanatory power of the model is high (adjR^2 = 36.8%). This is consistent with hypothesis H1. Economically, the results are significant, an increase of one standard deviation in each of *EBLLP* and *ΔEBLLP* increase *DLLP* by 84%.

[INSERT TABLE 8 ABOUT HERE]

For the large category, the coefficient of *EBLLP* (0.17389, p-value<0.01) is positive and significant at the 1 percent level, and the coefficient of the *ΔEBLLP* (0.01394, p-value<0.01) is

also positive and significant at the 1 percent level. This implies that large credit unions smooth earnings to avoid reporting earnings declines. For the small category, the coefficient of *EBLLP* (0.19881, p-value<0.01) is positive and significant at the 1 percent level, and the coefficient of the *ΔEBLLP* (0.00685, p-value<0.01) is also positive and significant at the 1 percent level. This also implies that small credit unions smooth earnings to avoid reporting earnings declines. A test for the significance of the difference in coefficients of large and small credit unions is conducted. The coefficients of *EBLLP* and *ΔEBLLP* for the large category are not statistically significant different from the coefficients of *EBLLP* and *ΔEBLLP* for the small category (p>0.05), respectively.

2.5.4 Credit union characteristics and earnings management

Table 8 also presents the variables that represent the characteristics of the credit unions engaging in earnings management. The positive and significant coefficient of *lnTA* (β_3 = 0.00008, p-value<0.01) is consistent with hypothesis H2a suggesting that earnings management increases as size increases. The negative and significant coefficient of *ROAA* (β_5 = -0.00094, p-value<0.01) is consistent with hypothesis H2b suggesting that earnings management increases as profitability decreases. The positive and significant coefficient of *NW* (β_6 = 0.00001, p-value<0.01) is consistent with hypothesis H2c suggesting that earnings management increases as net worth increases.

For the control variables that are indirect proxies for oversight, state-chartered credit unions engage more in earnings management than federal-chartered credit unions, the coefficient is negative and significant (β_7 = -0.00006, p-value<0.01); consistent with hypothesis H2d. Moreover, the coefficients of *Pop_Density* (β_9 = -0.0000, p-value<0.01) and *Educ_Level* (β_{10} = 0.00068, p-value<0.01) are significant but the sign for *Educ_Level* is contrary to the expected sign. As a sensitivity check, the regression controls for the economic variables at the Metropolitan Statistical Area, and the County levels; results are similar. Results are not tabulated for brevity.

The findings for the two subcategories, the large and small credit unions, are similar to the results of the whole sample. A test for the significance of the difference in coefficients of large and small credit unions is conducted. Only the coefficients of *Stat*, and *Educ_level* for the

large credit unions are statistically significant different from the coefficients of Stat, and *Educ_level* for the small category ($p<0.05$), respectively.

2.5.5 Incentives for earnings management

Table 9 presents the results of model (3) that examines the third hypothesis (H3): the incentive of merger leads credit unions' managers to engage in earnings management. The variable of interest is the interaction term, *Merge*EBLLP*. The positive and significant coefficient of Merge*EBLLP ($\beta_3 = 0.02606$, p-value<0.01) supports the third hypothesis. The positive and significant coefficient of *Merge*EBLLP* ($\beta_3 = 0.02503$, p-value<0.01) for the category of large credit unions supports the third hypothesis; the large credit unions engage in earnings management for the incentive of engaging in a merger activity. Also, the results of the category of small credit unions supports the third hypothesis, the coefficient of *Merge*EBLLP* ($\beta_3 = 0.02381$, p-value<0.01) is positive and significant. The coefficient of the interaction term for the large category is statistically significant different from the coefficient of the interaction term for the small category ($p<0.05$). Moreover, the coefficients of the variables *Merge*, *ΔlnTA*, *Stat*, and *Educ_level* for the large category are statistically significant different from the same coefficients for the small category ($p<0.05$). Economically, the differences between the large and small categories are significant. For example, in the category of large credit unions, the *DLLP* increases by 6.56% between non-merging and acquiring credit unions. Whereas, the *DLLP* increases by 3.41% between non-merging and acquiring credit unions in the small category. This can be explained by the fact that larger credit unions participate in mergers more than smaller sized credit unions.

[INSERT TABLE 9 ABOUT HERE]

2.6 Conclusion

Credit unions are financial institutions with a special type of ownership since the members own them. Within the same credit union, members share a common bond, which reduces information asymmetry (Keldon Bauer, 2015; Ward & McKillop, 2005). However, over time, sharing common bonds has lost importance (Keldon Bauer, 2015). Thus, the relaxation of sharing common bonds as well as larger credit union size, have allowed management's interests to further diverge from members' interests, thereby increasing the separation between both

parties. This has led to the evolution of different intentions and strategies; such as increased interest in new opportunities for growth and merger (Goddard et al., 2002), which further induce agency problems. Moreover, entrenched managers may want to pursue growth, profit and additional benefits which are not in the best interests of members/owners. Theoretically, Rasmusen (1988) and Fama and Jensen (1983a, 1983b) claim that members and boards of cooperatives are less likely to monitor and replace managers than do stockholders and boards of for-profit firms. With the economic implications of agency problems between managers and members/owners potentially rising as credit unions gain in size and scope, the study aims to examine if and how U.S. credit unions' managers take advantage of their situation through the mechanism of earnings management. The study finds that credit union managers in the U.S. engage in income smoothing through the discretionary use of LLP to avoid reporting earnings declines. Results also show that larger and better-capitalized credit unions engage in more earnings management, as do credit unions with a federal charter. The study also investigates the incentive for earnings management, it finds that credit unions' managers engage in earnings management if they have the incentive of engaging in merger activities.

This study contributes to the literature in several ways. First, this study extends the existing literature on earnings management. Few studies examine earnings management activities in credit unions. For instance, Maia et al. (2013) find that the Brazilian credit unions do not manage their earnings towards regulatory capital adequacy, rather they engage in income smoothing and earnings management to avoid reporting losses. In contrast, Australian credit unions' management increases capital adequacy ratios by practicing accounting window dressing techniques (Hillier et al., 2008). This study is the first that examines earnings management in U.S. credit unions. Second, this study contributes to the growing literature on the governance of credit unions. Credit unions are characterized by a specific weak governance system among its members, the board of directors and the general manager (Hillier et al., 2008; Keasey et al., 2005). Such governance system allows managers to use their discretion to manipulate earnings towards their benefits. Third, this study contributes to regulators and standard setters in the United States. This study shows that management, coupled with a weak governance system, is compromising its fiduciary responsibilities by taking accounting choices to report earnings that look better for its interest at the expense of members. This behavior from the management side would put the cooperative principle at risk.

Chapter 3: Credit unions vs commercial banks: who takes more risk?

Abstract

An interesting feature of the financial services industry is that for-profit institutions and not-for-profit financial intermediaries compete against one another, sometimes in an aggressive manner. The literature on the effect of competition among these two types of financial institutions on their risk-taking is scant. However, the literature has extensively discussed how risk-taking and competition interact in the banking industry, but the evidence is inconclusive. According to the competition-fragility hypothesis, increased competition induces banks' managers to take more risk; whereas, the competition-stability hypothesis shows the opposite. In this context, this study aims to examine how competition affects risk-taking of a matched sample (by size and county) of banks and credit unions, and whether it affects differently credit unions and banks. Several measures of risk-taking are used in the study. The first proxy is the *Z-score*, it measures the financial institution's stability, which is the distance from insolvency. The second and third proxies are the ratios of non-performing loans to total loans and loan charge-offs to total loans, they measure the credit risk. The period of the study is from 2010 till 2017. First, univariate analyses are conducted to compare the risk-taking of the two types of institutions. We find that the means of the risk-taking measures do not differ significantly between banks and credit unions. Second, examining the difference in the risk-taking of credit unions and banks in a multivariate analysis, we find that banks' managers engage in riskier activities. Third, we examine the effect of competition on the risk-taking. We find that increased competition induces managers of credit unions and banks to take more risk; this finding supports the competition-fragility hypothesis. We also find that credit unions' managers take more risk than banks' managers in the presence of competition. Finally, by including the quadratic term of competition, we find that there is a non-linear relationship between competition and risk-taking. This study has public policy implications: the American Banking Association argues that public policy toward credit unions and banks should be similar due to their similarities; whereas, credit unions express their difference to protect their privilege of tax exemption.

Keywords: Credit unions; Banks; Risk-taking; Competition; Lerner Index;

3.1 Introduction

"*The bank's scam is a marketing dream for credit unions… If there are any winners in the Wells Fargo & Co. scandal, it may be the mega-banks' not-for-profit country cousin, the credit union."* (Woolley, Bloomberg 2016).

An interesting aspect of the financial services industry is that for-profit institutions and not-for-profit financial intermediaries compete against one another (Emmons & Schmid, 2000). In fact, credit unions and commercial banks engage in often aggressive competition (Anderson & Liu, 2013). Both credit unions and commercial banks can have either a federal charter or a state charter and are governed by a set of regulations that maintains the competitive balance between the two types of institutions (Anderson & Liu, 2013). However, Stern, Swidler, and Hinkelman (2009) identify two major differences between banks and credit unions. First, credit unions' customers are their members; the members share a common bond based on criteria such as geographic location, employer or occupation. Second, the members are also the owners of the credit union. These unique institutional characteristics give rise to differences in governance. For instance, unlike banks, which governance system follows closely Jensen and Meckling's (1976) shareholder-focused principal-agent perspective, credit unions' governance revolves around members, a board of directors and an appointed general manager (Hillier et al., 2008; Keasey et al., 2005). Such a governance system faces several oversight and monitoring challenges since the board of directors consists mainly of volunteer members lacking the necessary skills to manage and monitor the credit union (Hillier et al., 2008). Wilcox (2006) even claims that the interests of managers and members of mutuals[6] are not aligned and that the corporate governance of mutuals is incompetent, and it is nothing but a set of entrenched managers ((Akella and Greenbaum 1988: 422, Smith and Underwood 1997: 17, and Daily 2000) in Wilcox, 2006).

Despite these differences between credit unions and commercial banks, both types of financial institutions compete in the same markets, and households essentially consider credit unions as an alternative to banks (Anderson & Liu, 2013). Credit unions are providing a variety of retail financial services similar to the ones offered by banks, such as interest-bearing business checking accounts and commercial loans, agricultural loans, and venture capital loans (Goddard,

[6] In mutual organizations, the customer becomes the user and owner of the business. A credit union is an example of a mutual where the depositors and the borrowers become the owners/members of the credit union.

McKillop, & Wilson, 2009). As credit unions have expanded their range of services and products over time, they are now perceived as interchangeable to mainstream financial service providers such as banks (Feinberg, 2001; Feinberg & Rahman, 2001; Hannan, 2003; Schmid, 2005; Tokle & Tokle, 2000). Nowadays, credit unions are aggressively competing with banks by being more active on the lending side (Fox, 2018). For example, in the first quarter of 2018, S&P Global Market Intelligence reported a quarter-over-quarter increase in commercial and industrial loans for credit unions of 3.9%, whereas small domestic commercial banks reported an increase of 2.0 % according to Federal Reserve.

The rise in credit unions' lending activity is exerting competitive pressures upon commercial banks (Fox, 2018). A principal belief about the relation between bank competition and risk is that as competition increases on banks, they would change their choices of borrowers (Bushman et al., 2016). The academic literature has extensively examined the effect of competition on risk-taking. In the banking industry, the results are explained by two contradicting hypotheses: according to the competition-fragility hypothesis, increased competition could erode the franchise value of a bank and encourage it to take more risk to preserve its profits (Keeley, 1990; Marquez, 2002). In contrast, the competition-stability hypothesis induces banks' managers to take less risk to protect their higher franchise value (Boyd & De Nicolo, 2005; Bushman et al., 2016; Jiménez, Lopez, & Saurina, 2013). In this context, this study aims to examine the risk-taking of banks and credit unions, and how competition affects risk-taking, i.e., whether it affects differently credit unions and banks.

Revisiting the issue of the relative value creation potential of banks and credit unions seems timely. For instance, the Wells Fargo & Co. 2016 fraudulent accounts' scandal illustrates that private sector governance does carry risks for customers which they are unlikely to face in a credit union. Hence, as an outcome of the scandal, credit unions expectations were to the effect that depositors and borrowers had lost trust in commercial banks and would look for safer places (creditunions.com); i.e., credit unions. The lower level of risks for credit unions is consistent with the view put forward by Smith and Woodbury (2010) who assume that banks and credit unions follow different risk strategies due to the difference in their governance structures, with the member-owned governance structure of credit unions leading them to engage in less risky strategies.

Alternatively, prior research shows that credit unions in mature industries such as the U.S., Canada, and Australia have a commercial based objective to compete with mainstream financial institutions (McKillop & Wilson, 2011). In an analysis of Australian credit unions, Worthington (2004) emphasizes that the process of deregulation and the increased competition in the financial industry have shaped the objectives of credit unions towards a more commercial orientation. Thus, commercial objectives are likely to compete for priority with that of balancing members' interests (McKillop & Wilson, 2011). Moreover, the objective of the financial institution can influence its asset portfolio. For example, banks can make risky loans to maximize their profits, whereas credit unions' risk comes from extending loans to customers with limited financial means. In another study, Challita (2016) compares the risk-taking of credit unions and banks in the U.S., she finds that credit unions take more risk than community banks[7]. Therefore, it is debatable whether credit unions' managers are less risk-takers knowing that they have a commercial objective in mind in the presence of a weak governance system.

The study is conducted on a sample of 412 credit unions that are matched to 412 banks by size and county location over the period from 2010 until 2017 on a quarterly basis. Two proxies for the competition are used. The first measure, the Herfindahl-Hirschman Index (*HHI*), is industry specific. It measures the market share of market competitors in a particular region, i.e., respectively commercial banks, and credit unions. The second measure, the Lerner Index (*LI*), is a firm-specific measure that measures the extent the bank or credit union can increase their marginal price beyond the marginal cost. Three proxies are used for risk-taking: 1) the *Z-score*, which measures an institution's stability, 2) the ratio of non-performing loans to total loans, and 3) the ratio of loan charge-offs to total loans. The second and third are measures for credit risk. First, univariate analyses are conducted to compare the means of the risk-taking and competition measures of the two types of institutions. Results show that the means of the risk-taking measures and the mean of the firm-specific measure of competition do not differ significantly between credit unions and banks in the sample. Second, examining the difference in the risk-taking of credit unions and banks in a multivariate analysis, we find that banks' managers engage in riskier activities. Third, also relying on regression analyses, the effect of

[7] "A community bank holds a commercial bank or thrift charter; operates physical offices only within a limited geographic area; offers a variety of loans and checkable insured deposit accounts; and has a local focus that precludes its equity shares from trading in well-developed capital markets." (DeYoung, Hunter, & Udell, 2004)

competition on risk-taking is examined. We find that increased competition induces banks' and credit unions' managers to take more risk. This finding is consistent with the competition-fragility hypothesis. We also find that credit unions' managers take more risk than banks' managers in the presence of competition. Finally, the risk-taking proxy is regressed on the quadratic term of the competition measure to find any possible non-linear relationship between competition and risk. We support the findings of Berger, Klapper, and Turk-Ariss (2009) and Jimenez et al., (2013) of a non-linear relationship between competition and risk-taking.

This study contributes to the literature in several aspects. First, it adds to the scant literature on the comparison of risk-taking between credit unions and banks. Several studies compare certain characteristics of banks and credit unions; however, few have looked at the management risk-taking of these two types of financial institutions. Smith and Woodbury (2010) compare the resiliency of banks and credit unions to economic stress from 1986 to mid-2009. They find that credit unions, in general, are less risky and conservative. They assume that banks and credit unions follow different risk strategies due to the difference in their governance structures, with the member-owned governance structure of credit unions leading them to less risky strategies. On the contrary, Challita (2016) compares the risk-taking of credit unions and banks in the U.S. over the period from 1999 until 2014. She finds that credit unions take more risk than community banks. However, these two studies compare the risk-taking of all the banks and credit unions without eliminating or controlling for the effect of the financial crisis, and the samples of both studies consist of all banks and credit unions without taking into consideration that the financial institutions' strategies differ according to size, and last they do not examine the effect of competition on the risk-taking. This study examines the risk-taking of a matched sample of credit unions and banks after the financial crisis.

Second, this paper adds to the strand of literature that considers the competition between credit unions and commercial banks. This study is the first study to examine the effect of competition on risk-taking in banks and credit unions, as prior research has mostly examined other facets of the industry. For example, Emmons and Schmid (2000) develop a dynamic theoretical model, and support it empirically, suggesting that commercial banks and credit unions compete directly in the local household deposit market. Feinberg (2001) presents a theoretical framework to explain the competitive discipline that credit unions provide on consumer credit

rates offered by banks, and suggests a significant role for credit unions in disciplining the exercise of market power by banks. Feinberg and Rahman (2001), using Granger-causality tests, conclude that due to the competition between banks and credit unions in the US, banks take account of loan rates offered by credit unions while setting their own rates for two types of consumer loans, and vice versa. Hannan (2003) assesses the competitive power of credit unions by investigating the deposit pricing behavior of several types of financial institutions in the same market. He finds that banks and thrifts offer higher rates on deposits in markets where there is a significant credit union presence.

Third, this study adds to the governance literature by comparing the risk-taking of credit unions and commercial banks in the presence of different ownership and governance structures. Commercial banks and credit unions are similar since they are both financial institutions, which primarily accept deposits and make loans. However, the objectives of commercial banks are to maximize profits and prioritize the welfare of owners over customers; whereas, in credit unions, owners and customers coincide. Moreover, credit unions and commercial banks differ in the agency conflicts; while with commercial banks the conflict is between the customers and the owners, credit unions still face a potential conflict between borrowers (who want access to low-cost credit) and depositors (who want a high rate of return on funds invested). With different perspectives of conflict, this study extends the findings of Smith and Woodbury (2010) by comparing the risk-taking of a matched sample of commercial banks and credit unions and examining the effect of competition on the risk-taking of the two types of financial institutions which differ in terms of ownership and governance structures.

Fourth, this study has public policy implications. According to Adams, Brevoort, and Kiser (2007), the willingness of consumers to substitute between different types of financial institutions is of strong interest to policymakers. For example, the American Banking Association argues that public policy toward credit unions and banks should be similar assuming that the two types of institutions are not very different (Smith & Woodbury, 2010). On the other hand, credit unions express their difference to policymakers and stakeholders especially to protect their privilege of tax exemption. This study empirically provides evidence that credit unions' behaviors are oriented commercially and that they take more risk than banks. Therefore, one can assume that the members' interests are at risk.

The remainder of the paper proceeds as follows: the next section reviews the relevant literature and develops the research questions. Section 3 details the sample selection and describes the research design including the empirical model. Section 4 reports and discusses the empirical results. Finally, section 5 concludes the paper.

3.2 Literature review and research question development:

3.2.1 Risk-taking: credit unions vs. banks

The literature on risk-taking behavior in credit unions is scant. Given that credit unions are mutuals where the members are the owners, one may conclude that they are contractually organized to avoid moral hazard engagement (McKillop & Wilson, 2011). Credit unions depend on internally generated capital to fuel expansion which hinders their involvement in risky activities. Concurrently, raising new capital for future growth is difficult. Thus management is encouraged to be conservative (Llewellyn & Holmes, 1991). Moreover, since managers of financial cooperatives do not share in the profits of the organization through stock-based compensation packages, they may act in a risk-averse manner (Rasmusen, 1988).

However, similar to stock-owned financial institutions, regulations (deregulations) usually discourage (encourage) risk-taking behaviors. For example, the introduction of deposit insurance for credit unions may increase their probability of engaging in risky behavior. Black and Duggar (1981) and Clair (1984) find evidence of increased risk-taking by credit unions post-adoption of deposit insurance. They show that credit unions usually take greater risks in the form of lower capital and liquidity levels and higher loan-to-share ratio. However, Karels and McClatchey (1999), employing time-series and cross-sectional tests, do not find any evidence of an increase in risk-taking post-adoption of deposit insurance. Moreover, Van Dalsem (2017) finds that uninsured depositors and excess share insurers provide valuable monitoring benefits for credit unions; thus, they are value-maximizing stakeholders who exercise control over the firm and prevent the management from taking risk.

Moreover, following the deregulation of the credit union industry[8], several studies find evidence that diversification through expansion impacts the risk profile due to lower information

[8] In 1982, the National Credit Union Administration (NCUA) interpreted the common bond requirement in a way to allow federal credit unions to add select employee groups and thus create institutions with multiple-group common

advantage after the weakening of the common bond. For example, Frame, Karels, and McClatchey (2002) empirically support the deregulation hypothesis by examining differences in credit union risk profiles based on membership type and expansion. They find that multiple-bond occupational credit unions have higher loan-to-share ratios and lower capital ratios. Moreover, Ely (2014) finds evidence that credit unions that switched from single-bond institutions to broader field-of-membership types operate with greater risk due to diversification effects and changes in informational advantages. In tests for differences in risk of bankruptcy and of breaching regulatory standards, the risk is found to be greater for credit unions with broader field-of-membership types.

Furthermore, two studies examine the risk-taking of credit unions in comparison to the risk-taking of commercial banks. However, the findings of these two studies are contradictory. Smith and Woodbury (2010) compare the resiliency of banks and credit unions to economic stress by examining the sensitivity of loan delinquencies and net charge-offs to the unemployment rate. They find that credit unions, in general, are less risky and follow conservative portfolio strategies. Smith and Woodbury (2010) blame the differences in incentives to assume risk on the different governance structures of the two types of institutions. On the contrary, Challita (2016) finds that credit unions have a higher level of insolvency risk due to the unsecured and small loans that credit unions extend to their members.

These two types of financial institutions offer similar products and are competitors in the same market. However, they still differ regarding their governance and ownership structures. Therefore, we expect that credit unions and commercial banks make different operating and investing decisions. Moreover, banks with different corporate governance structure, under the same regulation, face different risks (Laeven & Levine, 2009). Based on this, we develop the first research question:

RQ 1: ***Is risk-taking in credit unions different from risk-taking in commercial banks?***

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bonds. In 1998, the Credit Union Membership Access Act (CUMAA) expressly permitted federal credit unions to add multiple common bonds under certain conditions.

3.2.2 Competition and risk-taking

The U.S. credit union industry is mature (McKillop & Wilson, 2011) and credit unions provide an array of retail financial services similar to those of banks[9]. These product offerings have distorted the lines of separation between credit unions and mainstream financial services providers, such as banks (Goddard et al., 2009). Moreover, increased competition in the financial industry has reshaped the objectives of credit unions towards a more commercial orientation (Worthington, 2004). Several studies examine the economic impact of credit unions, and their role as competitors to banks. For example, Emmons and Schmid (2000) conclude that credit unions and commercial banks are indeed direct competitors in the local household deposit market. Similarly, Hannan (2003) finds that credit unions are strong competitors, and that the presence of credit unions has an impact on banks' and thrifts' deposit rates. In markets with credit union presence, higher deposit rates are offered by banks and thrifts. On the lending side, Feinberg (2001) finds that increased competition from credit unions lowers the rates on unsecured consumer loans and auto loans. Thus, the presence of credit unions impacts rates that banks can charge on consumer loans.

From another perspective, banks play an important role in the financial system, but at the same time, they are prone to excessive risk-taking which is of concern to regulators and academics. The process of deregulation has lifted many restrictions on competition in the banking sector which opened up the possibility for banks to engage in risky activities (Carletti, 2008). The theoretical and empirical literature has extensively examined the effect of competition on risk-taking in banks; but the evidence is inconclusive (Bushman et al., 2016; Carletti, 2008). The hypotheses used in the literature to explain the effect of competition on risk-taking are the competition-fragility hypothesis and the competition-stability hypothesis. On the one hand, the competition-fragility hypothesis posits that increased competition could erode the franchise value of the bank, thus creating incentives for excessive bank risk-taking to preserve profits (e.g., (Keeley, 1990; Marquez, 2002). For example, in a market with high competition among banks, certain banks could become at risk of solvency. Therefore, these banks, to preserve their profits, are motivated to pursue risky activities; such as extending riskier loans and

[9] Financial services provided by credit unions include interest-bearing business checking accounts and commercial loans, agricultural loans, and venture capital loans. Some credit unions deal in investment products such as bankers' acceptances, cash forward agreements and reverse purchase transactions.

taking on credit risk in the loan portfolio, lowering capital levels, or both (Jiménez et al., 2013). On the other hand, the competition-stability hypothesis posits that restrained competition encourages banks to protect their higher franchise values by pursuing safer policies. For example, banks with greater market power charge higher rates, which induce borrowing firms to take on greater risk and increases the risk of banks' loan portfolios. This leads to the conclusion that banks become less risky as competition increases (Boyd & De Nicolo, 2005; Bushman et al., 2016; Jiménez et al., 2013).

In sum, credit unions and banks are aggresive competitors in the same market, and the increased competition has structured the objectives of credit unions towards a more commercial orientation. Prior studies has examined the effect of this competition on deposit and loan rates; however, is the effect on risk-taking going to be different? Based on this, the second research question is:

RQ 2: ***Does competition affect risk-taking in credit unions differently than in commercial banks?***

3.3 Data and research design

3.3.1 Data

The dataset is constructed from financial information published by U.S. credit unions and commercial banks in their regulatory reports and made available by SNL Financials over the period 2010 - 2017. The dataset starts in 2010 to attenuate any confounding effect from the financial crisis.

Credit unions and commercial banks operating in the same geographical area are considered as competitors since they target the same clients. Therefore, a matching is performed on the two types of financial institutions in the same county that are closest in size (similar to Lys and Watts (1994)[10]). Size is measured by total assets at the end of 2017. The range of variance in size is +/- 15%. Each credit union is matched to only one bank; i.e., multiple matches

[10] Lys and Watts (1994) match a sample of firms whose auditors are sued to a control sample of firms whose auditors are not sued. The matching is based on two criteria in the filing year: the size of the firm (measured by total assets) and the three-digit SIC industry.

are dropped. The ending sample is formed of a pair of 412 credit unions and 412 commercial banks.

3.3.2 Variables measurement

3.3.2.1 Measures for risk-taking

In this study, we use the measures of risk that are derived from accounting data.[11] The first measure of risk-taking is the *Z-score*. This proxy has been used extensively in the literature to measure risk-taking in banks (Beck, De Jonghe, & Schepens, 2013; Chircop, Fabrizi, Ipino, & Parbonetti, 2017; Kanagaretnam, Lee, & Lobo, 2014; Laeven & Levine, 2009) and credit unions (Beck et al., 2013; Ely, 2014; Goenner, 2018). The *Z-score* measures the institution's stability which is the distance from insolvency (Roy, 1952). It is computed as $(ROA + EA)/\sigma(ROA)$, where ROA is earnings to asset ratio, EA is equity to asset ratio, and σ(ROA) is the standard deviation of ROA over the sample period. The *Z-score* indicates the number of standard deviations that a bank's ROA has to drop below its expected value before equity is depleted and the bank or credit union becomes insolvent. The higher the *Z-score*, the more stable is the institution. The *Z-score* is highly skewed, thus its logarithmic transformation is used, and then it is multiplied by −1, so that a higher value indicates higher risk. For brevity, the label "*Z-score*" is used in the remainder of the paper to refer to the negative of the natural logarithm of the *Z-score* explained above.

The second measure of risk-taking used in this study is the ratio of non-performing loans to total loans (*NPL*), which is an ex-post measure of credit risk. Credit risk is the primary driver of risk for most banks (Jiménez et al., 2013). Non-performing loans are the loans that have been modified in a troubled debt restructuring, are past due, or for which interest revenue is not currently being recorded. They correspond to economic losses and losses of interest revenue resulting from the poor credit quality of the borrower (Chircop et al., 2017).

The third measure of risk-taking also used in the literature is the ratio of net loan charge-offs to total loans (*NCO*). Charge-offs are the loans that are written off and deemed uncollectible in

[11] Risk measures based on share price cannot be used since the credit unions are member owned and not publicly traded, and most of the commercial banks in this study are privately owned banks and not publicly traded.

the financial statement. *NCO* is also a measure of credit risk; however, it is subject to managerial discretion (Liu & Ryan, 2006).

3.3.2.2 Measures for competition

Various measures of the degree of bank competition have been used in the literature; however, there is no consensus as to which measure is better (Beck, 2008; Bushman et al., 2016). Similar to other studies, this study uses the Herfindahl-Hirschman Index to measure the industry structure, and the Lerner Index to indicate the market power without regard to the industry structure.

Herfindahl-Hirschman Index (*HHI*)

The first measure to be used in this study is the Herfindahl-Hirschman Index (HHI) for depository financial institutions in the U.S. Prior studies calculate the HHI variable by extracting the data from the summary of deposits in market share from the database provided by the Federal Deposit Insurance Corporation (FDIC), which is for U.S. banks only. This study, similar to Challita (2016), calculates the index using the deposit data of credit unions and commercial banks available in the SNL financials database, Eq (1):

$$HHI_{jt} = \sum_{i=1}^{n} s_{ijt}^2$$

Where j is the county, i is the financial institution in the market j; s is the market share of deposits of each institution (commercial bank and credit union) i for time t in the county j.

The disadvantage of this measure is that it does not take into consideration the competition from potential entrants and other institutions competing in the market (Bushman et al., 2016). Therefore, I will use another measure for competition, which is a measure of the market power.

Lerner Index (LI)

The Lerner Index is a firm-specific measure that attempts to capture the extent to which firms can increase the marginal price beyond the marginal cost (Beck et al., 2013). The Lerner Index (LI) examines the relationship between the factor input and the factor output (Bushman et al.,

2016) and is computed following Beck et al. (2013) and Bushman et al. (2016) as follows, Eq (2):

$$LI_{it} = \frac{P_{it} - MC_{it}}{P_{it}}$$

where P_{it} is the price of the financial institution i at time t, defined as the operating income (interest revenue plus noninterest revenue) to total assets; and the MC_{it} is the marginal cost, estimated using the following translog cost function, Eq (3):

$$\ln(C_{it}) = \beta_0 + \beta_1 \ln(Q_{it}) + \beta_2 \ln(Q_{it})^2 + \sum_{k=1}^{3} \gamma_{kt} \ln(W_{k,it}) + \sum_{k=1}^{3} \emptyset_k \ln(Q_{it}) \ln(W_{k,it}) + \sum_{k=1}^{3}\sum_{j=1}^{3} \ln(W_{k,it}) \ln(W_{j,it}) + \in_{it}$$

C_{it} are the bank's total costs (interest expenses plus noninterest operating expenses) to total assets. Q is the bank's total output, which is defined as total assets. W_1, W_2, and W_3, are the input price of labor, of funds, and of fixed capital respectively. W_1 is total wages scaled by total assets, W_2 is the interest expense to total deposits, and W_3 is defined as noninterest expenses divided by total assets.

Equation (3) is estimated using all observations of commercial banks and credit unions with available data. The predicted coefficients are then used to calculate the marginal cost for each observation as follows, Eq (4):

$$MC_{it} = \frac{C_{it}}{Q_{it}} [\widehat{\beta_1} + \widehat{\beta_2} \ln(Q_{it}) + \sum_{k=1}^{3} \widehat{\emptyset}_k W_{k,it}]$$

The resulting measure of MC of each credit union or commercial bank at every quarter is inserted in equation (2) to calculate the *LI* measure.

3.3.3 Research design

The model, used to analyze the difference in risk-taking between credit unions and commercial banks, is defined by Eq. (5):

$$Risk_{it} = \alpha_0 + \alpha_1 Type_i + \alpha_2 STAT_i + \alpha_3 Type_i * STAT_i + \alpha_4 lnTA_{it} + \alpha_5 \Delta lnTA_{it} + \alpha_6 ROA_{it} + \alpha_7 KA_{it} + \alpha_8 LoanRatio_{it} + \alpha_9 EBLLP_{it} + \alpha_{10} LoanGrowth_{it} + \alpha_{11} Deposits_{it} + \alpha_{12} UNEMPL_{jt} + \alpha_{13} Rural_j + LOANCATEGORIES_{it} + TimeControls + \varepsilon_{it}$$

And, the general model, used to analyze the effect of competition on the risk-taking of credit unions and commercial banks, is defined by Eq. (6):

$$Risk_{it} = \alpha_0 + \alpha_1 Type_i + \alpha_2 Competition_{it} + \alpha_3 Type_i \times Competition_{it} + \alpha_4 STAT_i + \alpha_5 Type_i * STAT_i + \alpha_6 lnTA_{it} + \alpha_7 \Delta lnTA_{it} + \alpha_8 ROA_{it} + \alpha_9 KA_{it} + \alpha_{10} LoanRatio_{it} + \alpha_{11} EBLLP_{it} + \alpha_{12} LoanGrowth_{it} + \alpha_{13} Deposits_{it} + \alpha_{14} UNEMPL_{jt} + \alpha_{15} Rural_j + \alpha_{16} Rural_j * Competition_{it} + LOANCATEGORIES_{it} + TimeControls + \varepsilon_{it}$$

Where j is the county, i is the financial institution in the market j, and time t

Risk	=	Measure of risk;
Type	=	1 for commercial banks, 0 for credit unions;
Competition	=	Measure of competition;
STAT	=	1 for state-charter, 0 for federal-charter;
lnTA	=	Natural logarithm of total assets;
ΔlnTA	=	Proxy for Growth
ROA	=	Return on assets;
KA	=	Regulatory Capital ratio (Net worth to assets ratio);
LoanRatio	=	Ratio of total loans to total assets;
EBLLP	=	Earnings before loan loss provisions and taxes scaled by lagged total loans
LoanGrowth	=	Percentage change in total loans over the quarter
Deposits	=	Total deposits scaled by lagged total loans
UNEMPL	=	Unemployment rate from the Bureau of Labor Statistics;
Rural	=	Percentage of rural area in the county;
LOANCATEGORIES	=	(1) Real Estate, (2) Consumer, and (3) Commercial.

The risk measures included in our analysis are the *Z-score*, the *NPL* ratio, and the *NCO* ratio. The measures of competition included in our analysis are the Herfindahl−Hirschmann Index (*HHI*) and the Lerner Index (*LI*). The variable *Type* controls for the type of the financial institution, whether a commercial bank or credit union.

Several control variables that may have an effect on risk-taking are included similar to prior studies (Bushman et al., 2016; Chircop et al., 2017; Kanagaretnam et al., 2014; Kasman & Kasman, 2015). Size (*lnTA*) measured by the natural logarithm of total assets, and asset

composition (*LoanRatio*) which is the ratio of total loans to total assets, control for firm-specific heterogeneity. *Deposits*, total deposits scaled by lagged loans, controls for differences in funding. We control for profitability using *ROA*, the ratio of earnings before tax to total assets; and for growth by *ΔlnTA*, the difference in total assets between the current period and the prior period. *EBLLP* is earnings before loan loss provisions and taxes scaled by lagged total loans; *LoanGrowth* is the percentage change in total loans over the quarter, and *KA* is the ratio of total capital or equity to assets.

Moreover, financial institutions' estimation of credit losses is influenced by the loan portfolio composition and the loan administration procedures (AICPA, 2016). The loan composition is used as a measure of risk. Similar to Bushman et al. (2016), the loan portfolio composition variables included in this model are *Real Estate, Consumer,* and *Commercial* loans. *Real Estate* consists of all the loans secured by real estate whether residential or nonresidential property, *Consumer* consists of loans to individuals for household, family, or other personal expenditures, and *Commercial* is composed of all the other loan categories that are not classified as real estate or consumer.

STAT is the proxy for the charter type. State-chartered credit unions or banks are supervised by the state regulator; therefore, they might exhibit different risk patterns from the federal-chartered credit unions or banks (Ely, 2014).

The economic environment measures used in this study are similar to Ely (2014). The first economic environment measure is the unemployment rate (*UNEMPL*). Institutions operating in markets experiencing high unemployment rate are expected to record higher measures of risk of bankruptcy. The unemployment variable is based on the county in which the commercial bank or credit union is headquartered. Moreover, since financial institutions in urban and rural areas may face different types of risk, *Rural*, is included to identify the percentage of rural area in each county. Moreover, the market concentration is usually higher in non-rural markets; therefore, the interaction term *Rural***Competition* is included in the model.

TimeControls variable controls for period-specific effects. An OLS regression tests the model. Table 12 defines all the variables used in the analyses and their corresponding sources.

Following Berger, Klapper, and Turk-Ariss (2009) and Jimenez et al. (2013), we also use a quadratic term for the competition measures to find a possible non-linear relationship between competition and risk, Eq (7):

$$\begin{aligned} Risk_{it} = {} & \alpha_0 + \alpha_1 Type_i + \alpha_2 Competition_{it} + \alpha_3 Competition_{it}^2 + \alpha_4 Type_i \times Competition_{it} \\ & + \alpha_5 Type_i \times Competition_{it}^2 + \alpha_6 STAT_i + \alpha_7 Type_i * STAT_i + \alpha_8 lnTA_{it} \\ & + \alpha_9 \Delta lnTA_{it} + \alpha_{10} ROA_{it} + \alpha_{11} KA_{it} + \alpha_{12} LoanRatio_{it} + \alpha_{13} EBLLP_{it} \\ & + \alpha_{14} LoanGrowth_{it} + \alpha_{15} Deposits_{it} + \alpha_{16} UNEMPL_{jt} + \alpha_{17} Rural_j \\ & + \alpha_{18} Rural_j * Competition_{it} + LOANCATEGORIES_{it} + TimeControls + \varepsilon_{it} \end{aligned}$$

The continuous variables are checked for outliers and winsorized at the 1st and 99th percentile if needed.

3.4 Empirical results

3.4.1 Descriptive statistics

Tables 13 and 14 report descriptive statistics for the different risk measures, competition measures, and the control variables used in the regression. Table 13 reports the descriptive statistics for credit unions. Table 14 reports the descriptive statistics for the same variables for banks.

[INSERT TABLE 13 ABOUT HERE]

[INSERT TABLE 14 ABOUT HERE]

The results in tables 13 and 14 show that the average (median) credit union in the sample of this study has a *Z-score* of -4.0151 (-4.0359), this is comparable to the average (median) bank's *Z-score* of -3.9848 (-4.0227). For the average (median) credit union in our sample, *NCO* and *NPL* represent 0.15% (0.10%) and 1.04% (0.76%) of gross loans, respectively; whereas, for the average (median) bank in our sample, *NCO* and *NPL* represent 0.10% (0.00%) and 1.98% (0.99%) of gross loans, respectively. Regarding the competition measures, the average (median) *HHI* is 27% (22%) for credit unions and banks; this measure is the same for credit unions and banks since it is an industry measure. The average (median) credit union has an *LI* of 0.1483 (0.1521), while the average (median) bank has an *LI* of 0.1745 (0.1958).

The descriptive statistics also reveal that the average (median) credit union in the sample has a size of around $200 million ($180 million) of total assets, with the largest and smallest credit unions have an asset size of $37 billion and $8.8 million, respectively. The average (median) bank in the sample has a size of around $186 million ($176 million) of total assets, with the largest and smallest banks have an asset size of $35 billion and $8.5 million, respectively. On average, credit unions and commercial banks have similar growth rates of 1.24% and 1.35%, respectively. However, the performance of the banks is better with a mean (median) *ROA* of 0.2153% (0.2131%) compared to a mean (median) *ROA* of 0.1420% (0.1399%) for credit unions. Banks in the sample are more capitalized than the credit unions with mean (median) capital ratio of 14.92% (15.00%) for banks compared to 10.89% (10.14%) capital ratio for credit unions.

Most of the loans for the commercial banks are classified in the *Real Estate* category, 76.26%, while a non-trivial percentage are classified in the *Commercial* category, 18.88%. Whereas most of the loans for the credit unions are divided equally between the *Real Estate* (48.43%) and *Consumer* (45.32%) categories, and the category of *Commercial* loans is only 6.25%.

Table 15 presents Pearson and Spearman pairwise correlations between the variables used in the regressions in Table 15. The lower part of the correlation matrix is the Pearson's correlation matrix while the upper part is the Spearman's correlation matrix. The three proxies for risk-taking are highly correlated, and the two proxies for competition are highly correlated[12]. The *HHI* measure of competition is positively correlated with the risk-taking measures, while the *LI* measure of competition is negatively correlated with the risk-taking measures. Simple correlation analysis suggests a negative relationship between the *LI* measure of competition and risk, supporting the competition-fragility hypothesis; on the contrary, the positive relationship between the *HHI* measure of competition and risk supports the competition-stability hypothesis.

[INSERT TABLE 15 ABOUT HERE]

[12] In Beck, De Jonghe, and Schepens (2013), they do not find a correlation between Herfindahl-Hirschman Index (*HHI*) and Lerner Index (*LI*).

3.4.2 Univariate analysis

We employ simple univariate analysis to obtain a first impression on potential differences between banks' and credit unions' risk-taking measures and the firm-specific competition measure. The univariate analysis allows for the investigation as to whether risk measures and competition for credit unions are significantly different from those reported by commercial banks. The results of the t-test of mean differences are reported in Table 16. Most importantly, the results show that the three measures for risk-taking (*Z-score*, *NCO*, and *NPL*) and the firm-specific competition measure (*LI*) do not differ significantly between credit unions and banks in the sample.

[INSERT TABLE 16 ABOUT HERE]

3.4.3 Multivariate analysis

This section analyzes the research questions in a multivariate framework to provide more reliable evidence on the difference between the risk-taking of banks and credit unions, and then on the effect of competition on the risk-taking of the two types of financial institutions. Ordinary least squares (OLS) regressions are employed, with quarter fixed effects to control for any general time trend effects and cluster standard errors by both quarter and financial institution. Continuous variables with outliers are winsorized at the 1% in both tails to reduce the influence of outliers.

Table 17 reports the results of the first research question in a multivariate analysis. Alternative risk measures are regressed on type, and the control variables. Results reveal that banks are more risky than credit unions in the absence of competition. The coefficients of the *Type* variable are positive and significant at the 1% level in the regressions of *Z-score*, *NCO*, and *NPL.* The results mean that banks' managers are more risk-taking than credit unions' managers. The coefficients of *Type* are 0.5959 (p-value < 0.01), 0.00024 (p-value < 0.01), and 0.00957 (p-value < 0.1) in the regressions of *Z-score*, *NCO*, and *NPL*, respectively.

[INSERT TABLE 17 ABOUT HERE]

Tables 18 through 21 report the results of the second research question, which takes into consideration the effect of competition on the risk-taking of the two types of financial

institutions. Alternative risk measures are regressed on alternative measures of competition, and the control variables. Tables 18 and 19 report the results of the regression of the risk measures on the *HHI* and *LI* measures of competition, respectively. Results are consistent with the competition-fragility hypothesis, where increased competition induces banks' and credit unions' managers to take more risk, and the results are consistent for the industry-specific (*HHI*) and firm-specific (*LI*) measures of competition. The coefficients of the *HHI* and *LI* are negative and significant at the 1% level; which means that risk is inversely related to the value of *HHI* or *LI*, and as the value of either *HHI* or *LI* increases then competition is decreasing. The coefficients of *HHI* are -0.18454 (p-value < 0.01), -0.00017 (p-value < 0.01), and -0.00022 (p-value > 0.1) in the regressions of *Z-score*, *NCO*, and *NPL*, respectively. The coefficients of *LI* are -1.54297 (p-value < 0.01), -0.00124 (p-value < 0.01), and -0.03460 (p-value < 0.01) in the regressions of *Z-score*, *NCO*, and *NPL*, respectively. Moreover, the coefficient of the interaction term between competition and type is of interest to determine whether banks' or credit unions' managers take more risk in the presence of competition. The coefficient of the interaction term between *HHI* and *Type* in table 18 is positive but insignificant for the *Z-score* (0.04575, p-value > 0.1) and *NCO* (0.00015, p-value > 0.1) measures of risk and only significant for the regression with *NPL* (0.00510, p-value < 0.01) as a measure of risk. However, the coefficient of the interaction term between *LI* and Type in table 19 is negative and significant at the 1% level of significance for *Z-score* (-0.60408, p-value < 0.01), *NCO* (-0.00154, p-value < 0.01), and *NPL* (-0.03138, p-value < 0.01). Therefore, we provide evidence that credit unions' managers take more risk than banks' managers in the presence of competition.

[INSERT TABLE 18 ABOUT HERE]

[INSERT TABLE 19 ABOUT HERE]

As for the control variables, *STAT* is positive and significant for *Z-score*, and negative and significant for *NPL*; therefore, state regulations are more strict with credit risk than insolvency risk. *STAT*Type* is only negative and significant for *Z-score*, meaning that state regulations are less strict with credit unions than banks when it comes to insolvency risk. Size (proxied by the natural logarithm of total assets), profitability (proxied by the return on assets), and *KA* (proxied by regulatory capital) are negatively related to the risk measures, suggesting that larger, profitable, and well-capitalized institutions are less risky. *EBLLP* is positive and significant

suggesting that as earnings before tax and provision increase, managers will take more risk. The coefficients of *Deposits* and *LoanGrowth* are negative and significant suggesting that as the ratio of deposits to total loans and the loan portfolio increase from quarter to quarter, financial institutions become more conservative and grant less risky loans. Moreover, the coefficient of the percentage of the unemployment rate is positive and significant in all the regressions, suggesting that increases in unemployment rate increase the risk of bankruptcy. The coefficient of the *Percent Rural* is negative and significant and the coefficient of *Rural*Competition* is positive and significant, suggesting that risk increases in the areas with higher market concentration.

[INSERT TABLE 20 ABOUT HERE]

[INSERT TABLE 21 ABOUT HERE]

Tables 20 and 21 report the results of the regression of the risk measures on the quadratic term for the competition measures, *HHI* and *LI* respectively. In this specification, the values of the coefficients of the competition and the quadratic term of the competition are of interest. In table 20, the coefficients of *HHI* are positive and significant (except for the *Z-score*, insignificant), and the coefficients of HHI^2 are negative and significant, the results find support for the non-linear relationship between risk and competition similar to the findings of Berger et al. (2009). Whereas in table 21, the coefficients of *LI* are negative and significant, and the coefficients of LI^2 are positive and significant, the results support a U-shaped pattern between competition and risk-taking, similar to the findings of Jimenez et al. (2013).

[INSERT TABLE 22 ABOUT HERE]

An additional test, we also examine the impact of bank competition on the risk-taking of banks and credit unions by including both measures of competition in the same regression, i.e., industry-specific and firm-specific measures. The regression results are reported in table 22. The results are similar to the results in tables 18 and 19 when we used each measure of competition separately.

3.5 Conclusion

An interesting feature of the financial services industry is that for-profit institutions and not-for-profit financial intermediaries compete against one another, sometimes in an aggressive manner. Nowadays, credit unions are aggressively competing with banks by being more active on the lending side (Fox, 2018). As competition increases on banks, they would take more risk by changing their choices of borrowers (Bushman et al., 2016). However, the literature on how risk-taking and competition interact in the banking industry is inconclusive. According to the competition-fragility hypothesis, increased competition induces banks' managers to take more risk; whereas the competition-stability hypothesis shows the opposite. This study empirically examines the risk-taking, and how competition affects the risk-taking of a matched sample (by size and county) of banks and credit unions, and whether it affects differently credit unions and banks.

Risk-taking is measured by the financial institution's stability, which is the distance from insolvency, and credit risk. The proxy of the distance to insolvency is *Z-score*, and the proxies of credit risk are the ratios of non-performing loans to total loans (*NPL*) and loan charge-offs to total loans (*NCO*). And two measures for competition are used, an industry-specific measure (*HHI*) and a firm-specific measure (*LI*). The period of the study is from 2010 till 2017. First, univariate analyses are conducted to compare the risk-taking of the two types of institutions. We find that the means of the risk-taking measures do not differ significantly between banks and credit unions. Second, examining the difference in the risk-taking of credit unions and banks in a multivariate analysis, we find that banks' managers engage in riskier activities. Third, a regression examines the effect of competition on risk-taking. We find that increased competition induces managers of credit unions and banks to take more risk; this finding supports the competition-fragility hypothesis. We also find that credit unions' managers take more risk than banks' managers in the presence of competition. Finally, by including the quadratic term of competition, we find that there is a non-linear relationship between competition and risk-taking.

This study contributes to the literature in several aspects. First, it adds to the scant literature on the comparison of risk-taking between credit unions and banks. Second, this paper adds to the strand of literature that considers the competition between credit unions and commercial banks. Moreover, this is the first study to examine the effect of competition on risk-

taking in banks and credit unions, as prior research has mostly examined other facets of the industry. Third, this study contributes to the governance literature by comparing the risk-taking of credit unions and commercial banks in the presence of different ownership and governance structures. Finally, the study has public policy implications: the American Banking Association argues that public policy toward credit unions and banks should be similar due to their similarities; whereas, credit unions express their difference to protect their privilege of tax exemption.

Chapter 4: Which is the most attractive credit union? Characteristics of targets?

Abstract

As any mature industry, the credit union industry in the United States has experienced increased consolidation. Nowadays, the majority of credit unions merge to expand their services. These mergers are considered to be voluntary. According to the National Credit Union Administration (NCUA) merger rules, the voluntary merger process is legal, except that it is not transparent to members, especially in terms of compensation paid to boards and executives of acquired credit unions. While governance and compensation data is not publicly available for credit unions, this study attempts to identify certain traits of the target credit unions in comparison to acquiring and non-merging credit unions. The analysis is performed both qualitatively and quantitatively. First, the paper presents a clinical analysis of three cases of mergers of credit unions. Each case is analyzed from the perspective of agency theory to determine the reason for merger. The three cases illustrate how the executives and directors are seeking their own utilities at the expense of the members. Second, we aim to identify certain characteristics of target credit unions empirically by comparing a sample of acquired credit unions to a matched sample of non-merging credit unions and the acquiring credit unions. The sample comprises U.S. credit unions above $10 million in total assets that merged to expand their services between 2011 and 2017. We identified a list of ratios that are used by the NCUA for credit union assessment, a univariate analysis of variance tests for differences between the means of these ratios among the three groups (targets, acquiring, and non-merging credit unions); the means of the ratios of the three groups are statistically different. Then, factor analysis is performed to classify the major factors that explain the majority of variance. Growth, capital adequacy, asset quality, and earnings are the major ratios that differentiate between the target, acquiring, and non-merging credit unions. The paper has public policy implications; it provides the NCUA with the necessary information for the amendment of the voluntary mergers proposed rule on May 25, 2017.

Keywords: Mergers; target; voluntary merger; acquisition; credit union; agency hypothesis.

4.1 Introduction

As any mature industry, the credit union industry in the United States has experienced increased consolidation[13]. Four decades ago, more than 20,000 active credit union charters existed in the United States; recently, less than one third of these credit unions remain (Creditunions.com). This sharp decrease in the number of credit unions is mainly due to liquidations and involuntary mergers, most often an outcome from providing poor service to members (Keldon J. Bauer et al., 2009). After inspecting the reasons for the recent credit unions mergers (since 2011), table 23 shows that the majority of credit unions merge to expand their services, and not due to poor financial condition.

This new trend of mergers is regarded as a voluntary merger. For example, on July 1, 2017, Cornerstone FCU (with $109.1M in assets and based in Carlisle, PA) merged with Belco Community Credit Union ($470.9M in assets and based in Harrisburg, PA) under the pretext of a "brighter future" for their members. Belco Community CU is more than four times larger than Cornerstone. Nevertheless, its expense ratio over the past five years has been over 1% of average assets higher than Cornerstone. As a result of its cost advantage, Cornerstone was able to offer its members better interest rates and lower fees than Belco. However, Cornerstone's board of directors and management team completed the merger deal without giving their members any due diligence or comparison; despite that more than 35% of the members were against the merger (Filson, creditunions.com, June 26, 2017). Thus, one concludes that the board and management of Cornerstone are being compensated for this deal, and they benefit by sacrificing their members' wealth and loyalty. Had the members of Cornerstone perceived Belco as more efficient, they could have joined it a long time ago.

According to the National Credit Union Administration (NCUA) merger rules, the voluntary merger process is legal, except that it is not transparent to members, especially regarding compensation paid to boards and executives of acquired credit unions. For example, a credit union had a merger-related compensation in the "low seven-figure" range to 18 executives, with four executives getting the bulk of the money (McCarthy, Credit Union Digest May 25, 2017).

[13] "A credit union is a customer/member owned financial cooperative, democratically controlled by its members, and operated for the purpose of maximizing the economic benefit of its members by providing financial services at competitive and fair rates" (World Council of Credit Unions [WOCCU], 2017)

Moreover, Chip Filson, co-founder and Chairman of the Board of Callahan & Associates, and a nationally recognized leader in the credit union industry (CU.com, 2017) said that: "This charade of voluntary mergers is becoming more frequent. Stealing members' collective wealth may not violate NCUA rules, but it's certainly corrupt". He describes it as a managed sale of the credit union by its board and management at the expense of its members.

The voluntary merger in the credit union industry can be described as a tender offer takeover agreed to by both parties; however, not a hostile takeover (R. Brown, Brown, & O'connor, 1999). However, the parties involved in the takeover are the management and board members of the acquiring and target credit unions and not the members. Moreover, the negotiations include compensation to the management and board of target credit unions. For example, during a recent review, the NCUA found that 75% to 80% of mergers have included "significant" merger-related compensation to executives of the acquired credit union without disclosing it to the members (McCarthy, Credit Union Digest May 25, 2017).

Wilcox (2006) claims that the interests of managers and members of mutuals[14] are not aligned and that the corporate governance of mutuals is incompetent, and it is nothing but a set of entrenched managers. Moreover, The Credit Union Membership Access Act (CUMAA) of 1998 relaxed the common bond restrictions by allowing credit unions to add more member groups. As a result, management started seeking new opportunities for growth or merger (Goddard et al., 2002). This study aims to investigate the motives of management and characteristics of target credit unions after the passage of CUMAA in 1998. First, three cases of mergers are presented and analyzed from the perspective of agency hypothesis in mergers. Then, the characteristics of target credit unions are examined in comparison to matched non-merging credit unions and acquiring credit unions. The non-merging credit unions are matched by state and size in total assets. The analysis is performed on the credit unions that merged for expansion between 2011 and 2017. First, a univariate analysis of variance tests for differences between the means of the ratios among the three groups (targets, acquiring, and non-merging credit unions); the means of the ratios of the three groups are statistically different. Second, factor analysis is performed to identify the major factors that explain the majority of variance. We find that growth, capital

[14] In mutual organizations, the customer becomes the user and owner of the business. A credit union is an example of a mutual where the depositors and the borrowers become the owners/members of the credit union.

adequacy, asset quality, and earnings are the major ratios that differentiate between the target, acquiring, and non-merging credit unions.

This study contributes to the literature in several ways. First, it contributes to the mergers and acquisition literature on financial institutions, more specifically on credit unions. The literature on bank mergers is vast and disparate; whereas, the literature on credit union mergers is minuscule. Credit unions have experienced a phase of consolidation in many countries. The number of credit unions declined by 16 percent during the period 2007-2011 in Australia, Canada, Ireland, New Zealand, South Korea, and the UK and by 14 percent in the US (Prieg & Greenham, 2012). However, the majority of the few mergers related academic papers (e.g., (Fried, Lovell, & Yaisawarng, 1999; Ralston, Wright, & Garden, 2001; Worthington, 2004) investigate the determinants and consequences of mergers in American and non-American credit union before the financial crisis and by looking at the effect on service provision. In this study, we seek to update the literature by examining the merger activity for US credit unions after the financial crisis, i.e., starting in 2011; since the financial crisis had an enormous effect on the financial sector.

Second, several studies investigate the characteristics of takeover targets using a normative approach to construct a predictive model that identifies takeover targets (Thompson, 1997). This study adds to the prior findings of the determinants of mergers in credit unions by a clinical analysis of three credit union merger cases that have been extensively discussed in the media, and then looking at the characteristics of targets and comparing the targets to a matched sample of non-merging credit unions and acquirers. For example, Sant and Carter (2015) examine only one determinant of credit union merger, i.e., poor management ability, by looking only at the managerial performance of acquired credit unions before the acquisition date. Examining the financial ratios over 23 quarters before the merger date, they find that the financial ratios of acquired credit unions decline up to two years prior to the merger. Sant and Carter (2015) examine the whole population of merged credit unions from third quarter 2008 till the first quarter of 2014. However, they only examine the trends in the performance of target credit unions prior to mergers.

Third, this study provides information to regulators and standard setters in the United States about the importance of a new rule for the mergers. The NCUA is concerned that recent mergers

are tailored towards executives' benefits and keeping owners/members uninformed. Management and boards are compromising their fiduciary responsibilities to their members and putting the cooperative principle at risk, for the purpose of a merger. As a result, on May 25, 2017, the NCUA board approved a proposed rule that would require credit unions involved in a voluntary merger to open up member communications and provide greater transparency before mergers. Moreover, NCUA Acting Board Chairman J. Mark McWatters said: "the rule would follow an SEC approach of full and fair disclosure of material items involved in a merger."

The rest of this paper is structured as follows. Section 2 provides background information on the merging process in credit unions and reviews the literature. Section 3 discusses the conceptual underpinnings. Section 4 describes the research method. Section 5 presents the results of the empirical analysis. Finally, Section 6 summarizes and concludes.

4.2 Literature review

4.2.1 Background

The voluntary merger rule adopted by the National Credit Union Administration (NCUA) Board requires credit unions proposing to merge to submit a merger package that includes a plan summarizing the details of the merger. The package should also include financial compensation related to the merger. Moreover, federal credit unions should present the documents related to their disclosures of the merger to their members. The package is reviewed by the NCUA regional office and is approved if the proposed merger meets the member protection, safety and soundness requirements. Besides, merging federal credit unions' members are given the opportunity to vote on the merger (Federal register, 2017).

The NCUA analyzed the recent merger trends in the industry; they find that some acquiring credit unions are influencing the merging credit union by offering financial incentives to management and certain highly compensated employees to support the merger. As a result, on May 27, 2017, the NCUA Board proposed and sought comments on the revision to the voluntary merger procedure. The proposed changes are not only to federal chartered credit unions, and they include: "revise and clarify the contents and format of the member notice; require merging credit unions to disclose all merger-related financial arrangements for covered persons; increase the

minimum member notice period; and provide procedures to allow reasonable member-to-member communications regarding the proposed merger" (Federal register, 2017).

4.2.2 Literature on mergers in credit unions

Credit unions are known for their financial services, especially for the weaker and disadvantaged segments of society (Goddard et al., 2002). Prior research on credit union mergers examines the consequences of service provision, by analyzing how the service changes after the merger for acquiring and acquired credit unions. Moreover, studies on credit union mergers are country-specific and limited to the mature industries in countries such as in the U.S., Australia, and Canada.

For example, NCUA (1989) investigates the effect of mergers on the financial safety and soundness of the merging credit unions. In a sample of 509 merging credit unions, the study finds that the financial condition of healthy credit unions declined during the two years following the merger. Thus, the members of the surviving credit union experienced diminished service provision. However, the financial condition of the weak credit unions improved following the merger. As a result, the service provided to their members improved.

By the same token, Fried, Lovell, and Yaisawarng (1999) use data envelopment analysis (DEA) to analyze the service provision in acquired and acquiring credit unions in the U.S. between 1989 and 1994. They find that, three years following the merger, the service provided to the members/owners of acquired credit unions improved. Whereas, members/owners of acquiring credit unions benefited more when they and the target credit union had different levels of profitability, different numbers of select employee groups, and when one of them had a community charter. However, on average, the acquiring credit unions did not experience any change in service provision following the merger. Also using DEA, Ralston, et al. (2001) evaluate the gains in technical and scale efficiency achieved by the merged credit union in Australia between 1993 and 1995. Their findings are mixed. Gains are larger when pre-merger technical efficiency scores were low for both partners; which is inconsistent with the belief that technical efficiency gains are recognized by the transfer of assets from inefficient managers to efficient managers. They find that the efficiency gains generated by the merger are not more than the efficiency gains generated through internal growth of non-merging credit unions. In New

Zealand, Mcalevey, Sibbald, and Tripe (2010) employ DEA to examine efficiency changes in merged credit unions between 1996 and 2001. However, they find that government action required mergers and not increased efficiency.

Alternatively, Bauer, Miles, and Nishikawa (2009), using a different methodology, examine the performance of merged U.S. credit unions. They find that the performance of the acquired credit union improved. Whereas, the acquiring credit union performance did not change. In Bauer (2010), the author compares consolidated state farm credit unions to a control sample of non-farm credit unions. He finds that both the members of the acquiring and acquired credit unions benefit from the merger since the merging credit unions were healthy, of comparable size and offered similar products.

Moreover, Goddard, McKillop, and Wilson (2009) use a hazard function and include technology variables in the determinants of credit union mergers in the U.S. during the period 2001–2006. They find that the probability of a credit union to be acquired is negatively related to asset size and profitability, and directly related to liquidity. Whereas, Worthington (2004) finds that the probability of acquisition of Australian credit unions is influenced by asset size, asset management, liquidity, and regulatory variables during the period 1992–1995.

Sant and Carter (2015) examine a determinant of credit union merger, i.e., poor management ability, by looking only at the managerial performance of acquired credit unions before the acquisition date. Examining the financial ratios over 23 quarters prior to the merger date, they find that the financial ratios of acquired credit unions decline up to two years before the merger. Finally, McKillop, Ferguson, and Goth (2006) did not find any determinant of a merger in UK credit unions after 2004. They only find that service provision of healthy credit unions deteriorates after acquiring unhealthy credit unions.

4.3 Conceptual underpinning

The academic literature has categorized the reasons for acquisitions in any industry into synergy, agency/managerialism and hubris hypotheses (Bauer et al., 2009). Seth, Song and Pettit (2000) describe the three hypothesis: acquisitions that take place when the value of the new combined firm is greater than the sum of the values of the individual firms are described as synergy, the agency/managerialism hypothesis suggests that managers seek acquisitions that

maximize their own utility at the expense of the owners, and the hubris hypothesis suggests that bidding firm managers make mistakes in evaluating target firms, but undertake acquisitions presuming that their valuations are correct.

Davis and Staout (1992) state that the most effective way to take control of an opposed target is by tender offers. The mergers in credit unions are described as tender offers agreed to by the management and board of acquiring and acquired credit unions without members' consent. Therefore, mergers in credit unions can best be described by the agency/managerialism hypothesis. In credit unions, the agency problem arises from self-serving and entrenched managers engaging in activities that serve their interest and not the interest of owners (Wilcox, 2006). Moreover, Davis (2005) discusses the intensity of the owner-manager agency problem with the development of the credit union; as credit unions grow in size, entrenched managers would seek growth opportunities through mergers which based on wealth expropriation motives.

4.4 Research method

This paper investigates the reasons for mergers of credit unions first through a detailed clinical analysis of three cases of mergers of credit unions, and then through an empirical analysis of merged credit unions between 2011 and 2017. The data is gathered from different sources: Financial data is gathered from SNL financials database; articles in the news are gathered from Credit Union Digest (SNL articles), creditunions.com, and cutoday.info.

Each case is presented in the following manner: first, a general description of the merging credit unions, regarding their respective age, size, performance, and characteristics, is presented. Second, we present a synopsis of the merging case. Third, we present financial highlights, for the three years before the merger date, for the acquiring and target credit unions. Finally, we comment on any observed new trends in mergers from the perspective of the agency hypothesis of mergers.

4.4.1 Case analysis

We choose three merging cases that have been discussed extensively in the news to be our case studies for this research paper. Our cases selection aimed to provide a picture of the new trend in mergers of credit unions and to support the NCUA board update of the merger rules. The case mergers selected for analysis in this study are the merger of Cornerstone Federal Credit

Union into Belco Community credit union, the merger of North Island Financial into California Credit Union, and the merger of Belvoir Federal Credit Union into Pentagon Federal Credit Union.

4.4.1.1 Cornerstone FCU into Belco Community Credit Union

Cornerstone Federal Credit Union (Cornerstone FCU) and Belco Community Credit Union (Belco CCU) completed the merger deal in July 2017. Cornerstone FCU was established in 1974 to serve the community of Cumberland County, Pennsylvania. At the date of the merger, Cornerstone FCU had $108.5 million in total assets and was serving 11,078 members through four branches with twenty-seven full-time employees and eight part-time employees. It had an ROA of 0.23% and a net worth of 9.96 %; the credit union was considered well-capitalized. Belco CCU, a federally insured state chartered credit union, was established in 1939 to serve the communities of Adams, Cumberland, Dauphin, Lancaster, Lebanon, Perry or York Counties, and Pennsylvania. At the date of the merger, Belco CCU had $474.7 million in total assets and serving 474,656 members through eleven branches, and 124 full-time employees and twenty-one part-time employees. It had an ROA of 0.94 % and a net worth of 9.76 %; the credit union was also considered well-capitalized. As a result of the merger of the two credit unions, no branch locations closed and all the employees of both credit unions are retained. The Chief Executive Officer (CEO) of Belco Community Credit Union, Amey Sgrignoli, serves as the CEO of the combined credit union and the CEO of Cornerstone, Samuel Glesner, became part of the executive team. Moreover, the directors of Cornerstone FCU joined Belco CCU as volunteers to serve on committees, as associate directors, and as voting directors.

Belco CCU and Cornerstone FCU announced plans to merge in late 2016 after both Board of Directors gave their initial approval in October of the same year. Before the deal was completed, the members of the acquired credit union should approve the merger deal. However, the prior CEO of Cornerstone FCU, Dave Keffer, led an effort to stop the merger assuming that the merger was not to the benefit of the members. Keffer served as a CEO of Cornerstone FCU for 33 years before retiring in 2014, and Glesner was serving as the President of the board before he became the CEO. Few months before Keffer retired, Belco CCU approached Cornerstone FCU about a merger, but they were turned down. However, the management team along with the

board, after Keffer, approved the merger. Keffer claimed that Cornerstone FCU is outperforming Belco CCU, by having a lower expense-to-asset ratio, a stronger net worth position, and competitive fees to members. Moreover, he believed that Cornerstone FCU did not provide all the information about the deal to its members to be able to make an informed decision. He said. "I feel members were being left in the dark about a lot with this merger. You control the communications, and you control the vote … This deal was done without any sunshine on it, no open air."

[INSERT TABLE 24 ABOUT HERE]

After comparing the performance of Belco CCU and Cornerstone FCU over the three years before the merger, we notice that Cornerstone FCU outperforms Belco CCU in some of the areas. For example, in 2015, Cornerstone FCU has higher asset, share and deposit, and member growth rates than Belco CCU, which means Cornerstone FCU is implementing more effective business strategies in the market to attract more members. Even though Cornerstone FCU has a lower ROAA, this might not mean that it is a less profitable credit union, but this might be due to the lower fees that it charges its members; this can be emphasized more by the lower ratio of noninterest income to average assets. Moreover, Cornerstone FCU has a higher net worth to assets ratio; this shows that the credit union management is not pursuing risky activities and accumulating the reserve. For example, the loan portfolio consists of a lower portion of credit card and unsecured loans, and vehicle loans compared to the loan portfolio of Belco CCU.

4.4.1.2 North Island Financial into California Credit Union

North Island Financial Credit Union (North Island CU) and California Credit Union (California CU) completed the merger deal in early 2017. North Island CU, federally insured state-chartered credit union, was established in 1940 to serve the community of San Diego, California. At the date of the merger, North Island CU had $1.26 billion in total assets and serving 73,486 members. It had an ROA of 0.45% and a net worth of 10%; the credit union was considered well-capitalized. It had twelve branches, and 222 full-time employees and 37 part-time employees. California CU, federally insured state-chartered credit union, was established in 1933 to serve school employees, current and retired educators, students and their families in California. At the date of the merger, California CU had $1.6 billion in total assets and serving

92,339 members. It had an ROA of 0.39% and a net worth of 11%; the credit union was also considered well-capitalized. It had thirteen branches, and 266 full-time employees and 36 part-time employees.

The North Island Financial and California Credit Union merger was the largest one in 2017. Both credit unions are of comparable sizes, and they planned to merge to provide "extraordinary banking experience" to their members. As a result of the merger, all the branches of the two credit unions will continue to operate to serve the members along with retaining all the employees of both credit unions. Moreover, the merged credit union will operate with dual headquarters, and the boards of directors and supervisory committees of both credit unions will combine to form the directors of the merged credit union. The CEO of North Island CU, Steve O'Connell, became the CEO of the combined credit unions; however, Steve O'Connell was the CEO of California CU before becoming the CEO at North Island. O'Connell said to the members: "California Credit Union is a natural fit as a merger partner with shared values and an absolute commitment to providing the best possible member experience in service, pricing, and convenience. Partnering with a healthy, established credit union will immediately expand our California footprint, significantly increase operating efficiencies, and put us in a much stronger competitive position…As a larger credit union, we will have the resources to continue to improve your banking experience with the latest online and mobile technologies, new products and services to meet all your financial needs, and highly competitive rates."

[INSERT TABLE 25 ABOUT HERE]

North Island CU and California CU are of comparable sizes. California CU had a better growth rate regarding assets, loans, and shares. The net worth ratio of North Island CU is better than the net worth of California CU; this implies that California CU is riskier. This is also supported by the higher ratio of delinquent loans to total loans, and the higher ratio of credit card and unsecured loans to total loans. California CU has a higher liquidity risk; the ratio of liquid assets to total assets is lower than the ratio for North Island, and a higher loans to deposits ratio. California CU charges higher fees to its members; i.e., they have a higher noninterest income to average assets ratio.

4.4.1.3 Belvoir FCU into PenFed CU

Pentagon Federal Credit Union (PenFed CU) and Belvoir Federal Credit Union (Belvoir FCU) completed the merger deal in early 2016. PenFed CU was established in 1935 to serve enlisted military personnel and civilian employees of the Department of the Army, and it is headquartered in Alexandria, Virginia. At the date of the merger, PenFed CU had $19.92 billion in total assets and serving 1.4 million members. It had an ROA of 0.81% and a net worth of 10.12%; the credit union was considered well-capitalized. It had thirty-four branches, and 1,666 full-time employees and 72 part-time employees. PenFed CU has a federal charter, and its members have multiple common bonds, but primarily military. Belvoir FCU was established in 1946 to serve military personnel and civilian employees of the United States Government, employees who work at Fort Belvoir, Virginia, and the communities of Fairfax and Prince William Counties, Virginia. At the date of the merger, Belvoir FCU had $333.3 million in total assets and serving 27,458 members. It had an ROA of 0.28%, and a net worth of 8.38%; the credit union was also considered well-capitalized. It had six branches, and 81 full-time employees and one part-time employee. Belvoir FCU had a federal charter and its members had multiple common bonds, but primarily military.

The merger between Belvoir FCU and PenFed CU seemed somewhat unexpected to many, especially the members. On February 23, 2016, the day before the announcement of the merger, Belvoir FCU was publicizing a new branch in Northern Virginia, yet they did not at all discuss the merger that was set to occur the following day. The deal seemed to be one-sided, and Belvoir did not gather the opinions of its members. Belvoir's board operated completely in secret from the approval in August 2015 until it sent out its required notice to members of the special meeting to vote on the merger. The notice was not mailed out until March 11, 2016, even though it was dated Feb. 24, 2016, when it was already too late for the members to seek out other options.

Board members were able to control what information they wanted to be released, so much information was left out. After Freedom of Information (FOIA) filings, the revealed documents of the merger did not include the board's or managers' due diligence in fulfillment of their fiduciary responsibility. The NCUA also insisted that compensation is disclosed to the official notice: "The CEO would receive a bonus of $250,000; the CFO and COO payments of $125,000

each, upon the merger's approval." However, they did not disclose any other staff bonuses or employment guarantees. For example, Alfred Rudolph, the Chairman of Belvoir FCU for the six years before the merger, was placed on the PenFed Board of Directors. Rudolph was the one who spearheaded the Board's decision to merge with PenFed.

Moreover, Belvoir FCU's board chair announced the intent to merge with PenFed in the February 2016 Special Membership Meeting Notice. The notice included a statement of the combined financial condition of the two credit unions, as of June 2015. The merger adjustments included an entry for "negative goodwill" totaling $40.7 million which would be added to PenFed's balance sheet when the combination was completed. Each member of Belvoir FCU paid around $1,482 to join PenFed, even though it had previously been an option for them to join PenFed by simply buying one redeemable share. PenFed recognized this extraordinary gain as "non-operating income" in 2016 to cover PenFed's operating expenses and support the dividend to its members.

[INSERT TABLE 26 ABOUT HERE]

Comparing the performance of PenFed CU and Belvoir FCU over the last three years before the merger, the table shows that PenFed CU has a better financial performance. The growth rates for PenFed CU are higher than Belvoir CU. The net worth to assets ratio of PenFed CU is higher, i.e., Belvoir FCU is riskier; this is also shown in the higher percentage of credit card and unsecured loans. The noninterest income to average assets is higher for Belvoir CU; this implies that Belvoir CU charges higher fees to its members. However, even though the financial performance of PenFed CU is better than the financial performance of Belvoir CU, it should be noted that the size of PenFed CU is more than fifty-five times the size of Belvoir CU. The members of Belvoir CU are served better since each full-time employee serves 343 members compared to PenFed CU where each full-time employee serves 945 members.

4.4.1.4 Synthesis of cases

Among the three hypothesis that explain the reasons for acquisitions, synergy, agency/managerialism, and hubris hypotheses, the agency/managerialism hypothesis best explains the three cases presented in this study. The agency/managerialism hypothesis suggests

that managers seek acquisitions that maximize their own utility at the expense of the owners (Seth et al., 2000). In the case of the merger of Cornerstone FCU into Belco CCU, despite all the opposition from the members, the management team with the board succeeded in completing the merger deal. The board controls the communication to the members; they convinced the uninformed investors about the benefits of the merger by telling them only the pros of the merger. They gave the members a short notice about the merger and to vote, which left the members with no option but to accept the deal as is. Moreover, the credit union members trust their management and board of directors. As a result, they will be convinced that the deal is for the benefit of the members.

The agency/managerialism hypothesis also explains the mergers of North Island CU into California CU and Belvoir CU into PenFed CU. The CEO of the merged Credit union of North Island CU and California CU, Steve O'Connell, served as the CEO of both credit unions. He is an insider who is very well connected to the key personnel of both credit unions. O'Connell should have been a major player in the negotiation of the merger of the two credit unions, and becoming the CEO of the merged credit union is the ultimate benefit for him. Moreover, in the merger of Belvoir CU and PenFed CU, not only the benefit went to the management and board of directors, but also the members had to pay for this merger to happen. It is true that PenFed CU is financially healthier than Belvoir CU; however, the members of Belvoir CU were happy with the service they are getting from Belvoir CU. Had they wanted to join PenFed CU, they could have done so a long time ago since both credit unions serve the military personnel in Virginia.

These merger deals are legal according to the NCUA regulations. However, to mitigate this agency problem in the mergers, the NCUA Board believes that more clarity is needed in the merging process to stop manipulative board members. As a result, the NCUA board requested comments on the new proposed rules. With a notice period more than two weeks, the members of Cornerstone FCU and Belvoir FCU could have investigated more about the deals, and the deals could have been rejected by majority vote. Moreover, the merging credit unions (Cornerstone FCU, North Island CU, and Belvoir FCU) did not disclose the merger-related financial arrangements and job guarantees for the covered persons. After the mergers, the management and directors of the merging credit unions ended up with executive positions in the acquiring credit union.

4.4.2 Quantitative analysis

4.4.2.1 Data Sources

The dataset is constructed from the financial information published by U.S. credit unions in their '5300 Call Reports' and made available by SNL Financials. The sample consists of all acquiring and acquired credit union quarterly observations available on SNL Financial from the first quarter of 2011 till the third quarter of 2017. The first quarter of 2011 is the initial date that SNL Financial started to gather data on the reasons for merger (Table 23). Then a non-merging credit union is matched for each target credit union based on the same state and size in total assets. The study only examines the credit unions that merged to expand their services. Moreover, federal credit unions with at least $10 million in assets must submit their financial reports in accordance with GAAP; as a result, all credit unions with less than $10 million in assets are dropped. Moreover, observations with extreme or non-sensical values for certain variables are eliminated from the sample.

[INSERT TABLE 27 ABOUT HERE]

4.4.2.2 Method

The study adopts the method of Sorenson (2000) to determine the characteristics of the target credit unions. The study is conducted in two steps. The first step involves the univariate analysis. Then an analysis of variance (ANOVA) tests for differences between the means of the financial ratios of the three groups. The ratios examined represent the CAMEL[15] ratios that are used by NCUA for credit unions assessment. The CAMEL ratios are defined in the Appendix.

Second, the analysis is performed using a multivariate factor analysis. The multivariate test might show that variables that are unimportant in the univariate comparison of means test are important. "Factor analysis is a statistical tool by which it is possible to disentangle complex interrelationships among a set of variables into a set of functional unities that identify the independent influences or causes at work" (Rummel, 1988).

[15] CAMEL stands for: Capital adequacy, Asset quality, Management quality, Earnings, and Liquidity. The ratios are defined in the Financial Performance Reports (FPR) User's Guide.

4.5 Empirical results

4.5.1 Descriptive statistics

Table 28 presents the summary statistics of the CAMEL ratios of each category in the study. Panels A presents the descriptive statistics of the target credit unions. The mean (median) total assets of a credit union in the acquired category is $52.78 million ($29.18 million), with the smallest credit union having $10.4 million and the largest $717.48 million. The mean (median) total loans of a credit union in the acquired category is $45.20 million ($24.68 million), and the mean (median) total shares and deposits is $2.2 million ($262 thousand). The acquired credit unions have a mean (median) quarterly growth rate of total assets of 2.54% (1.41%), a mean (median) quarterly growth rate of total loans of -1.92% (-3.38%), a mean (median) quarterly growth rate of total shares and deposits of 3.29% (1.93%), and a mean (median) quarterly growth rate of total equity of -2.02% (0.48%). They have an average (median) return on assets and net worth ratio of -0.20% (0.06%) and 11.79% (10.62%) respectively.

Panels B presents the descriptive statistics of the acquiring credit unions. The mean (median) total assets of a credit union in the acquiring category is $746.25 million ($321.79 million), with the smallest credit union having $20.15 million and the largest $37.3 billion. The mean (median) total loans of a credit union in the acquiring category is $642.20 million ($279.86 million), and the mean (median) total shares and deposits is $58.92 million ($12.37 million). The acquiring credit unions have a mean (median) quarterly growth rate of total assets of 7.61% (4.91%), a mean (median) quarterly growth rate of total loans of 7.40% (5.81%), a mean (median) quarterly growth rate of total shares and deposits of 7.70% (4.57%), and a mean (median) quarterly growth rate of total equity of 6.87% (6.01%). They have an average (median) return on assets and net worth ratio of 0.55% (0.59%) and 10.72% (10.29%) respectively.

Panels C presents the descriptive statistics of the non-merging credit unions. The mean (median) total assets of a credit union in the non-merging category is $59.34 million ($31.20 million), with the smallest credit union having $11.24 million and the largest $1.48 billion. The mean (median) total loans of a credit union in the non-merging category is $51.27 million ($26.81 million), and the mean (median) total shares and deposits is $5.44 million ($324 thousand). The non-merging credit unions have a mean (median) quarterly growth rate of total

assets of 4.22% (3.06%), a mean (median) quarterly growth rate of total loans of 2.66% (1.29%), a mean (median) quarterly growth rate of total shares and deposits of 4.50% (3.02%), and a mean (median) quarterly growth rate of total equity of 2.71% (2.98%). They have an average (median) return on assets and net worth ratio of 0.32% (0.35%) and 12.12% (11.23%) respectively.

[INSERT TABLE 28 ABOUT HERE]

4.5.2 ANOVA

In the first step, a univariate analysis of variance (ANOVA) to test for differences between the means of the ratios among the three groups is performed. Table 29 shows the following: the CAMEL ratios, the means for each ratio, the ANOVA F ratio, and the significance level for each group. Results show that the CAMEL ratios differ significantly between groups.

It appears from this initial test that non-merging credit unions have higher growth rates compared to acquired credit unions. On average, the non-merging credit unions have the highest net worth ratio, with acquiring credit unions having the lowest net worth ratio. The asset quality ratios of acquired and acquiring credit unions are almost the same; whereas, non-merging credit unions have higher quality assets. Merger target credit unions are similar in earnings ratios to non-merging credit unions. Except for the return on assets ratio and operating expense to gross income ratio, where the non-merging credit unions outperform the acquired credit unions. In addition, target credit unions have better liquidity since their loans to assets ratio is the lowest. Moreover, in terms of productivity, target and non-merging credit unions have the same productivity ratios, and they outperform acquiring credit unions.

[INSERT TABLE 29 ABOUT HERE]

4.5.3 Factor analysis

The multivariate factor analysis is performed in the second step of the analysis. We analyze the whole sample and then each category separately. Four major factors, with eigenvalues greater than one, are identified that explain the majority of the variance among the whole sample, and among each category of the acquired, acquiring, and non-merging credit unions. The four factors that are identified for the whole sample explain 34.43%, 16.84%, 14.98%, and 9.47% of the

sample variance, respectively. Table 30 shows the Factor Component Matrix after a Varimax rotation for the whole sample, and Table 31 – Panels A, B, and C show the Factor Component Matrix after a Varimax rotation for the acquired, acquiring, and non-merging credit unions, respectively. Tables 30 and 31 present the loading of each ratio on the four major factors identified in the factor analysis. A higher loading number indicates that the ratio is highly associated with that factor, the loadings with absolute value greater than 0.5 are highlighted.

[INSERT TABLE 30 ABOUT HERE]

[INSERT TABLE 31 ABOUT HERE]

After examining the factor loadings on the ratios, we find that the capital adequacy, asset quality, and earnings ratios load most highly on factor 1; growth ratios load most highly on factors 2 and 4; and asset quality ratios load most highly on factor 3.

4.6 Conclusion

With the increase in voluntary mergers in the credit unions industry, the NCUA is concerned that recent mergers are tailored towards executives' benefits and keeping owners/members uninformed. Management and boards are compromising their fiduciary responsibilities to their members and putting the cooperative principle at risk, for the purpose of a merger. As a result, on May 25, 2017, the NCUA board approved a proposed rule that would require credit unions involved in a voluntary merger to open up member communications and provide greater transparency before mergers. Performing a case analysis on three cases of voluntary mergers that were discussed in the media, the study supports the agency hypothesis that managers seek acquisitions that maximize their own utility at the expense of the owners.

Moreover, the second part of the study aims to identify certain characteristics of target credit unions empirically by comparing a sample of acquired credit unions to a matched sample of non-merging credit unions and the acquiring credit unions. The sample comprises U.S. credit unions above $10 million in total assets that merged to expand their services between 2011 and 2017. First, a univariate analysis of variance tests for differences between the means of the CAMEL ratios among the three groups (targets, acquiring, and non-merging credit unions) shows that the means of the ratios of the three groups are statistically different. Second, factor analysis is

performed to classify the major factors that explain the majority of variance. Growth, capital adequacy, asset quality, and earnings are found to be the major ratios that differentiate between the target, acquiring, and non-merging credit unions.

The main contribution of this study is its policy implication. This study shows the importance of a new rule for mergers which increases communication to members and provide greater transparency. Moreover, this study adds to the academic literature on mergers of credit unions. This study updates the literature by examining the merger activity for US credit unions after the financial crisis. Moreover, the study adds to the prior findings of the determinants of mergers in credit unions by performing a clinical case analysis, and then looking at the characteristics of targets and comparing the targets to a matched sample of non-merging credit unions and acquirers.

Finally, we acknowledge the limitations of this study. The study focuses only on three cases of mergers, even though this analysis reveals certain important trends in voluntary mergers that provide an in-depth understanding of the severity of these mergers to members, it confines the generalizability of the results. Moreover, in the case analysis, the study shows the role of management and boards in merger decisions; however, due to lack of governance and compensation data in credit unions, we are not able to compare these data for the three categories of credit unions. Yet, these limitations do not prevent this study from contributing to the credit unions merger literature by offering insights into the current merger practices. Finally, we believe that the findings of this study make interesting material for future research in which researchers and policy makers can better understand the trend of voluntary mergers and find solutions to protect the members.

Chapter 5: Conclusion

This dissertation is comprised of three essays which discuss crucial topics related to credit unions in the U.S. The first essay presents the presence of earnings management in credit unions and demonstrates how managers are sacrificing the members'/owners' benefits for their own interests. The second essay reveals the risk-taking of credit unions management, and how credit unions' managers are more risk-takers than banks' managers in the presence of competition. The third essay uncovers the trends of voluntary mergers to help regulators understand the practices and decisions of managers and boards to sell their credit unions, and the essay tries to find certain characteristics of credit unions that attract acquirers.

The first essay extends the earnings management literature by investigating earnings management engagement in the credit union industry. Prior studies on earnings management have discussed it from the perspective of manager-customer agency problem, and managers engage in earnings management to please the owners. However, this essay investigates earnings management in credit unions from the perspective of the manager-owner agency problem, and shows how entrenched managers seek their own benefit at the expense of the members'/owners' benefit.

The second essay probes into a special aspect of credit unions and banks, which is the risk-taking. Given that credit unions are mutuals where the members are the owners, one may conclude that they are contractually organized to avoid moral hazard engagement (McKillop & Wilson, 2011). The results of this essay are interesting since they are contradictory to the anecdotal belief that credit unions' managers are risk-averse. The essay provides evidence that in the presence of competition, credit unions' managers are more risk-takers than banks' managers.

The third essay contributes to the merger literature of credit unions by providing recent evidence on the new trend of voluntary mergers. The trend of the voluntary merger has raised concerns to regulators as it is putting the cooperative principle at risk. On May 25, 2017, the NCUA board approved a proposed rule that would require credit unions involved in a voluntary merger to open up member communications and provide greater transparency to members before mergers. The essay supports the necessity of this new rule by unfolding three cases of voluntary mergers. The three cases are analyzed from the perspective of the agency/managerialism

hypothesis which suggests that managers seek acquisitions that maximize their own utility at the expense of the owners.

In general, the dissertation contributes to the governance literature; the unique institutional characteristics of credit unions give rise to differences in governance from investor-owned firms. Owners of credit unions are the members themselves who are exposed to equal rights for voting and decision-making irrespective of the size of the deposits paid (Goddard et al., 2002). Therefore, each credit union member has the right to one vote at the annual general meeting to elect the board of directors (Mook et al., 2015). The elected board members are usually volunteer members who are not compensated. For example, Smith and Woodbury (2010) assume that banks and credit unions follow different risk strategies due to the difference in their governance structures. This dissertation divulges the consequences of volunteer board members that lack the skills and knowledge to monitor the management. This is shown in the first essay through the practice of earnings management. The second essay also supports the idea of weak governance by showing the risk-taking of credit unions' managers compared to the risk-taking of banks' managers. Finally, the third essay discloses how boards are colluding with management to sell their credit unions for certain compensations and/or guaranteed position.

Moreover, this dissertation has public policy implications. Credit unions are not-for-profit financial institutions intended to voluntarily support the weaker segments of society; therefore, they enjoy a tax-exemption benefit since 1978. Credit unions pass this tax benefit to its members through higher rates on the savings and deposits, and lower rates on loans. However, this has caused an ongoing debate from bankers claiming that credit unions should not enjoy the tax exemption since they have grown in size and have commercial objectives which caused them to go beyond their mission of serving the weaker segments of society. Moreover, a recent article in the American Bankers, on April 23, 2018 (https://www.americanbanker.com/news/do-credit-unions-still-warrant-a-tax-exemption), supports the debate by providing evidence from the example of Pentagon Federal credit union in Virginia. PenFed has expanded its field of membership significantly through acquiring several credit unions, it recently spent $164 million to build a new headquarter, and spent another $31 million on a marketing campaign. These expenses that are channeled away from the members are much more than what a commercial bank its size would spend. This dissertation supports the argument that credit unions have a

commercial objective, and compete directly with banks. The three essays raise the concern that the managers' activities are putting the cooperative principle at risk.

In this dissertation, the analysis is based on data published in the quarterly regulatory financial reports of credit unions. Credit unions do not have to prepare financial statements to the investors with disclosures. Therefore, the lack of governance data and the use of economic variables as indirect proxies for governance is a limitation of this dissertation. It would be interesting in the future to conduct studies based on data gathered either by surveys or interviews with the management and executives of credit unions. This would provide a more in-depth understanding of the governance and practices of management, and corroborate the findings.

In this dissertation, we concentrate mainly on credit unions in the United States. However, it would be interesting to look at reporting practices of credit unions in other countries. For example, in 2012, the Federal government of Canada established a new legal framework for co-operatives to expand their services across the country. The federal and state/provincial charters of US and Canadian credit unions provides a unique setting that can be explored and contribute to regulators and standards setters in both countries. For example, Canadian credit unions are not tax-exempt; therefore, comparing the credit unions in the two North American countries provides insights on whether the tax-exemption is advantageous to the members or managers are taking advantage of this benefit for their own interest.

References

Adams, R. M., Brevoort, K. P., & Kiser, E. K. (2007). Who competes with whom? the case of depository institutions. *The Journal of Industrial Economics, 55*(1), 141-167.

Ahmed, A. S., Takeda, C., & Thomas, S. (1999). Bank loan loss provisions: A reexamination of capital management, earnings management and signaling effects. *Journal of Accounting and Economics, 28*(1), 1-25.

AICPA. (2016). *Audit & accounting guide: Depository and lending institutions: Banks and savings institutions, credit unions, finance companies, and mortgage companies*. New York, NY: American Institute of Certified Public Accountants, Inc.

Akella, S. R., & Greenbaum, S. I. (1988). Savings and loan ownership structure and expense-preference. *Journal of Banking & Finance, 12*(3), 419-437.

Anandarajan, A., Hasan, I., & Lozano-Vivas, A. (2003). The role of loan loss provisions in earnings management, capital management, and signaling: The spanish experience. *Advances in International Accounting, 16*, 45-65.

Anandarajan, A., Hasan, I., & McCarthy, C. (2007). Use of loan loss provisions for capital, earnings management and signalling by australian banks. *Accounting & Finance, 47*(3), 357-379.

Anderson, R. G., & Liu, Y. (2013). Banks and credit unions: Competition not going away. *The Regional Economist, 21*(2), 4-9.

Ayers, B. C., Ramalingegowda, S., & Yeung, P. E. (2011). Hometown advantage: The effects of monitoring institution location on financial reporting discretion. *Journal of Accounting and Economics, 52*(1), 41-61.

Baker, A., & Thompson, S. (2000). Governance in financial mutuals. *Managerial Finance, 26*(9), 36-50.

Barth, M. E., Gomez-Biscarri, J., Kasznik, R., & López-Espinosa, G. (2017). Bank earnings and regulatory capital management using available for sale securities. *Review of Accounting Studies, 22*(4), 1761-1792.

Bauer, K. (2015). The corporate credit union crisis: Does it call for reform or re-engineering? *Journal of Banking Regulation, 16*(2), 89-105.

Bauer, K. (2008). Detecting abnormal credit union performance. *Journal of Banking & Finance, 32*(4), 573-586.

Bauer, K. J., Miles, L. L., & Nishikawa, T. (2009). The effect of mergers on credit union performance. *Journal of Banking & Finance, 33*(12), 2267-2274.

Bauer, K., & Miles, L. (2010). *Can credit union performance improve through mergers? the case of state farm credit union consolidation.* Unpublished manuscript.

Beatty, A., Chamberlain, S., & Magliolo, J. (1995). Managing financial reports of commercial banks: The influence of taxes, regulatory capital, and earnings. *Journal of Accounting Research,* , 231-261.

Beatty, A., & Harris, D. (1999). The effects of taxes, agency costs and information asymmetry on earnings management: A comparison of public and private firms. *Review of Accounting Studies, 4*(3), 299-326.

Beatty, A., Ke, B., & Petroni, K. (2002). Earnings management to avoid earnings declines across publicly and privately held banks. *The Accounting Review, 77*(3), 547-570.

Beatty, A., & Liao, S. (2014). Financial accounting in the banking industry: A review of the empirical literature. *Journal of Accounting and Economics, 58*(2), 339-383.

Beaver, W. H., & Engel, E. E. (1996). Discretionary behavior with respect to allowances for loan losses and the behavior of security prices. *Journal of Accounting and Economics, 22*(1), 177-206.

Beck, T. (2008). Bank competition and financial stability: Friends or foes? *Policy Research Working Papers,* (July)

Beck, T., De Jonghe, O., & Schepens, G. (2013). Bank competition and stability: Cross-country heterogeneity. *Journal of Financial Intermediation, 22*(2), 218-244.

Berger, A. N. (1995). The relationship between capital and earnings in banking. *Journal of Money, Credit and Banking, 27*(2), 432-456.

Berger, A. N., Klapper, L. F., & Turk-Ariss, R. (2009). Bank competition and financial stability. *Journal of Financial Services Research, 35*(2), 99-118.

Black, H., & Dugger, R. H. (1981). Credit union structure, growth and regulatory problems. *The Journal of Finance, 36*(2), 529-538.

Boyd, J. H., & De Nicolo, G. (2005). The theory of bank risk taking and competition revisited. *The Journal of Finance, 60*(3), 1329-1343.

Brown, R., Brown, R., & O'connor, I. (1999). Efficiency, bond of association and exit patterns in credit unions: Australian evidence. *Annals of Public and Cooperative Economics, 70*(1), 5-23.

Brown, C., & Davis, K. (2009). Capital management in mutual financial institutions. *Journal of Banking & Finance, 33*(3), 443-455.

Bushman, R. M., Hendricks, B. E., & Williams, C. D. (2016). Bank competition: Measurement, decision-making, and risk-taking. *Journal of Accounting Research, 54*(3), 777-826.

Carletti, E. (2008). Competition and regulation in banking. *Handbook of Financial Intermediation and Banking, 126*(5), 449-482.

Challita, S. (2016). *Impact of ownership strucutre on marketing strategies and on financial performances and risk: A multisectoral approach.* (Unpublished Université Montpellier,

Chircop, J., Fabrizi, M., Ipino, E., & Parbonetti, A. (2017). Does branch religiosity influence bank Risk-Taking? *Journal of Business Finance & Accounting, 44*(1-2), 271-294.

Clair, R. T. (1984). Deposit insurance, moral hazard, and credit unions. *Federal Reserve Bank of Dallas Economic Review,* , 1-12.

Collins, J. H., Shackelford, D. A., & Wahlen, J. M. (1995). Bank differences in the coordination of regulatory capital, earnings, and taxes. *Journal of Accounting Research,* , 263-291.

CreditUnions.com. (2017,). Credit unions for sale? Retrieved from http://www.creditunions.com/blogs/commentary/creditunionsforsale/?utm_source=20170215+Currently+On&utm_campaign=daily+email&utm_medium=email#

Davis, G., & Stout, S. (1992). Organization theory and the market for corporate control: A dynamic analysis of the characteristics of large takeover targets, 1980-1990. *Administrative Science Quarterly,* , 605-633.

Davis, K. (2001). Credit union governance and survival of the cooperative form. *Journal of Financial Services Research, 19*(2), 197-210.

Davis, K. (2005). Credit unions and demutualisation. *Managerial Finance, 31*(11), 6-25.

Dechow, P. M., & Skinner, D. J. (2000). Earnings management: Reconciling the views of accounting academics, practitioners, and regulators. *Accounting Horizons, 14*(2), 235-250.

DeYoung, R., Hunter, W. C., & Udell, G. F. (2004). The past, present, and probable future for community banks. *Journal of Financial Services Research, 25*(2-3), 85-133.

DiSalvo, J., & Johnston, R. (2017). BANKING TRENDS: Credit unions' expanding footprint. *Economic Insights, 2*(1), 17-25.

Ely, D. (2014). Credit unions and risk. *Journal of Regulatory Economics, 46*(1), 80-111.

Emmons, W. R., & Mueller, W. (1997). Conflict of interest between borrowers and lenders in credit co-operatives: The case of german co-operative banks. *Federal Reserve Bank of St. Louis Working Paper Series,*

Emmons, W. R., & Schmid, F. A. (2000). Banks vs. credit unions: Dynamic competition in local markets. *Federal Reserve Bank of St. Louis Working Paper Series,* (2000-006)

Fama, E. F., & Jensen, M. C. (1983a). Agency problems and residual claims. *The Journal of Law and Economics, 26*(2), 327-349.

Fama, E. F., & Jensen, M. C. (1983b). Separation of ownership and control. *The Journal of Law and Economics, 26*(2), 301-325.

Feinberg, R. M. (2001). The competitive role of credit unions in small local financial services markets. *The Review of Economics and Statistics, 83*(3), 560-563.

Feinberg, R. M., & Rahman, A. A. (2001). A causality test of the relationship between bank and credit union lending rates in local markets. *Economics Letters, 71*(2), 271-275.

Fields, T. D., Lys, T. Z., & Vincent, L. (2001). Empirical research on accounting choice. *Journal of Accounting and Economics, 31*(1), 255-307.

Fonseca, A. R., & González, F. (2008). Cross-country determinants of bank income smoothing by managing loan-loss provisions. *Journal of Banking & Finance, 32*(2), 217-228.

Forker, J., & Ward, A. M. (2012). Prudence and financial self-regulation in credit unions in northern ireland. *The British Accounting Review, 44*(4), 221-234.

Fox, Z. (2018, May 16, 2018). **Credit unions emerging as competitive threat to US banks in c&I lending**. Retrieved from https://platform.mi.spglobal.com/web/client?auth=inherit#news/article?id=44611982&KeyProductLinkType=8

Frame, W. S., Karels, G. V., & McClatchey, C. (2002). The effect of the common bond and membership expansion on credit union risk. *Financial Review, 37*(4), 613-636.

Fried, H. O., Lovell, C. K., & Yaisawarng, S. (1999). The impact of mergers on credit union service provision. *Journal of Banking & Finance, 23*(2), 367-386.

Goddard, J., McKillop, D., & Wilson, J. O. (2009). Which credit unions are acquired? *Journal of Financial Services Research, 36*(2-3), 231-252.

Goddard, J., McKillop, D., & Wilson, J. (2002). The growth of US credit unions. *Journal of Banking & Finance, 26*(12), 2327-2356.

Goddard, J., McKillop, D., & Wilson, J. (2008). The diversification and financial performance of US credit unions. *Journal of Banking & Finance, 32*(9), 1836-1849.

Goenner, C. F. (2018). The market for private student loans: An analysis of credit union exposure, risk, and returns. *Review of Quantitative Finance and Accounting, 50*(4), 1227-1251.

Graham, J. R., Harvey, C. R., & Rajgopal, S. (2005). The economic implications of corporate financial reporting. *Journal of Accounting and Economics, 40*(1), 3-73.

Hannan, T. H. (2003). The impact of credit unions on the rates offered for retail deposits by banks and thrift institutions. *FEDS Working Paper, No. 2003-06*

Hansmann, H. (1996). *The ownership of enterprise* The Belknap Press of Harvard University Press, Cambridge MA.

Hart, O., & Moore, J. (1996). The governance of exchanges: Members' cooperatives versus outside ownership. *Oxford Review of Economic Policy, 12*(4), 53-69.

Healy, P. M. (1985). The effect of bonus schemes on accounting decisions. *Journal of Accounting and Economics, 7*(1-3), 85-107.

Healy, P. M., & Wahlen, J. M. (1999). A review of the earnings management literature and its implications for standard setting. *Accounting Horizons, 13*(4), 365-383.

Hillier, D., Hodgson, A., Stevenson-Clarke, P., & Lhaopadchan, S. (2008). Accounting window dressing and template regulation: A case study of the australian credit union industry. *Journal of Business Ethics, 83*(3), 579-593.

Hoel, R. F. (2011). Power and governance: Who really owns credit unions? *Filene Research Institute, Madison, Wis,*

Jensen, M. C., & Meckling, W. H. (1976). Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of Financial Economics, 3*(4), 305-360.

Jiménez, G., Lopez, J. A., & Saurina, J. (2013). How does competition affect bank risk-taking? *Journal of Financial Stability, 9*(2), 185-195.

Kanagaretnam, K., Krishnan, G. V., & Lobo, G. J. (2010). An empirical analysis of auditor independence in the banking industry. *The Accounting Review, 85*(6), 2011-2046.

Kanagaretnam, K., Lobo, G. J., & Mathieu, R. (2003). Managerial incentives for income smoothing through bank loan loss provisions. *Review of Quantitative Finance and Accounting, 20*(1), 63-80.

Kanagaretnam, K., Lobo, G. J., & Mathieu, R. (2004). Earnings management to reduce earnings variability: Evidence from bank loan loss provisions. *Review of Accounting and Finance, 3*(1), 128-148.

Kanagaretnam, K., Lee, Y. L., & Lobo, G. J. (2014). Influence of national culture on accounting conservatism and risk-taking in the banking industry. *Accounting Review, 89*(3), 1115-1149. doi:10.2308/accr-50682

Kasman, S., & Kasman, A. (2015). Bank competition, concentration and financial stability in the turkish banking industry. *Economic Systems, 39*(3), 502-517.

Keasey, K., Thompson, S., & Wright, M. (2005). *Corporate governance: Accountability, enterprise and international comparisons* John Wiley & Sons.

Kedia, S., & Rajgopal, S. (2011). Do the SEC's enforcement preferences affect corporate misconduct? *Journal of Accounting and Economics, 51*(3), 259-278.

Keeley, M. C. (1990). Deposit insurance, risk, and market power in banking. *The American Economic Review,* , 1183-1200.

Kim, M., & Kross, W. (1998). The impact of the 1989 change in bank capital standards on loan loss provisions and loan write-offs. *Journal of Accounting and Economics, 25*(1), 69-99.

Laeven, L., & Levine, R. (2009). Bank governance, regulation and risk taking. *Journal of Financial Economics, 93*(2), 259-275.

Leggett, K. J., & Strand, R. W. (2002). Membership growth, multiple membership groups and agency control at credit unions. *Review of Financial Economics, 11*(1), 37-46.

Liu, C., & Ryan, S. G. (2006). Income smoothing over the business cycle: Changes in banks' coordinated management of provisions for loan losses and loan charge-offs from the pre-1990 bust to the 1990s boom. *The Accounting Review, 81*(2), 421-441.

Llewellyn, D. T., & Holmes, M. J. (1991). In defence of mutuality: A redress to an emerging conventional wisdom. *Annals of Public and Cooperative Economics, 62*(3), 319-354.

Lys, T., & Watts, R. L. (1994). Lawsuits against auditors. *Journal of Accounting Research,* , 65-93.

Maia, S. C., Bressan, V. G. F., Lamounier, W. M., & Braga, M. J. (2013). Earnings management in brazilian credit unions. *Brazilian Business Review, 10*(4), 91.

Marquez, R. (2002). Competition, adverse selection, and information dispersion in the banking industry. *The Review of Financial Studies, 15*(3), 901-926.

Mcalevey, L., Sibbald, A., & Tripe, D. (2010). New zealand credit union mergers. *Annals of Public and Cooperative Economics, 81*(3), 423-444.

McKillop, D., Ferguson, C., & Goth, P. (2006). Building better credit unions. *Policy Press,*

McKillop, D., & Wilson, J. O. (2011). Credit unions: A theoretical and empirical overview. *Financial Markets, Institutions & Instruments, 20*(3), 79-123.

Mook, L., Maiorano, J., & Quarter, J. (2015). Credit unions: Market niche or market accommodation? *Nonprofit and Voluntary Sector Quarterly, 44*(4), 814-831.

Prieg, L., & Greenham, T. (2012). Cooperative banks: International evidence. *New Economics Foundation, London,*

Ralston, D., Wright, A., & Garden, K. (2001). Can mergers ensure the survival of credit unions in the third millennium? *Journal of Banking & Finance, 25*(12), 2277-2304.

Ramesh, K., & Revsine, L. (2000). The effects of regulatory and contracting costs on banks' choice of accounting method for other postretirement employee benefits. *Journal of Accounting and Economics, 30*(2), 159-186.

Rasiah, D. (2010). Review of literature and theories on determinants of commercial bank profitability. *Journal of Performance Management, 23*(1), 23.

Rasmusen, E. (1988). Mutual banks and stock banks. *The Journal of Law and Economics, 31*(2), 395-421.

Reichert, A. K., & Rubens, J. H. (1994). Risk management techniques employed within the US credit union industry. *Journal of Business Finance & Accounting, 21*(1), 15-35.

Richardson, V. J. (2000). Information asymmetry and earnings management: Some evidence. *Review of Quantitative Finance and Accounting, 15*(4), 325-347.

Roy, A. D. (1952). Safety first and the holding of assets. *Econometrica: Journal of the Econometric Society,* , 431-449.

Roychowdhury, S. (2006). Earnings management through real activities manipulation. *Journal of Accounting and Economics, 42*(3), 335-370.

Rummel, R. J. (1988). *Applied factor analysis* Northwestern University Press.

Ryder, N. (2005). The regulation of credit unions: A comparative analysis between the USA and great britain. *Journal of Banking Regulation, 6*(3), 261-273.

Ryder, N., & Chambers, C. (2009). The credit crunch – are credit unions able to ride out the storm? *Journal of Banking Regulation, 11*(1), 76-86.

Sant, R. R., & Carter, S. B. (2015). Acquired credit unions: Drivers of takeover. *International Journal of Business and Social Research, 5*(8), 18-33.

Schmid, F. (2005). When for-profits and not-for-profits compete: Theory and empirical evidence from retail banking. *Managerial Finance, 31*(11), 50-71.

Smith, D. M., & Woodbury, S. A. (2010). Withstanding a financial firestorm: Credit unions vs. banks. *Filene Research Institute, Madison, Wis,*

Sorensen, D. E. (2000). Characteristics of merging firms. *Journal of Economics and Business, 52*(5), 423-433.

Stern, L. V., Swidler, S., & Hinkelmann, C. (2009). Deposit rate sensitivity of credit union shares. *Journal of Economics and Finance, 33*(3), 259-272.

Thompson, S. (1997). Takeover activity among financial mutuals: An analysis of target characteristics. *Journal of Banking & Finance, 21*(1), 37-53.

Tokle, R. J., & Tokle, J. G. (2000). The influence of credit union and savings and loan competition on bank deposit rates in idaho and montana. *Review of Industrial Organization, 17*(4), 427-439.

Van Dalsem, S. A. (2017). Uninsured deposits and excess share insurance at US credit unions: The impact on risk and returns to members. *Journal of Economics and Finance,* , 1-25.

Wahlen, J. M. (1994). The nature of information in commercial bank loan loss disclosures. *Accounting Review,* , 455-478.

Wall, L. D., & Koch, T. W. (2000). Bank loan-loss accounting: A review of theoretical and empirical evidence. *Economic Review-Federal Reserve Bank of Atlanta, 85*(2), 1.

Walter, J. R. (2006). Not your father's credit union. *FRB Richmond Economic Quarterly, 92*(4), 353-377.

Wang, S., & D'Souza, J. (2006). Earnings management: The effect of accounting flexibility on R&D investment choices. *Johnson School Research Paper Series, 33*(06)

Ward, A., & McKillop, D. G. (2005). An investigation into the link between UK credit union characteristics, location and their success. *Annals of Public and Cooperative Economics, 76*(3), 461-489.

Watts, R. L., & Zimmerman, J. L. (1990). Positive accounting theory: A ten year perspective. *Accounting Review,* , 131-156.

Wilcox, J. A. (2002). *Subordinated debt for credit unions* Filene Research Institute.

Wilcox, J. A. (2006). *Credit union conversions to banks: Facts, incentives, issues and reforms* Filene Research Institute Madison.

WOCCU. (2016). *2016 statistical report.* (Financials and Annual Report).World Council Of Credit Unions. Retrieved from https://www.woccu.org/documents/2016_Statistical_Report

Worthington, A. C. (2004). Determinants of merger and acquisition activity in australian cooperative deposit-taking institutions. *Journal of Business Research, 57*(1), 47-57.

Xu, R. Z., & Taylor, G. K. (2007). Economic cost of earnings management through stock repurchases. *Available at SSRN 982165,*

Appendix 1

Table 1 Sample selection

All credit unions available in SNL Financials	5,836
Less: Credit unions with $10 million or less in total assets	(1,649)
Less: Credit unions with more than $10 million in total assets but was established less than 10 years ago	(4)
Less: Corporate Credit unions	(10)
Less: Credit unions with less than $50 million in total assets	(2,636)
Credit unions used in study	**1,537**

Table 2 Cleaning process

Process	**All Observations**
Credit union- quarter observations	86,072
Less: Observations with extreme or unbelievable value for any variable	(2,438)
Total observations	**83,634**

Table 3 Distribution by charter type and size

NCUA Charter Type	**# of credit unions**	**# of quarterly observations prior to cleaning**	**# of quarterly observations after cleaning**
Federal	796	44,576	43,489
Federally Insured State Chartered	697	39,032	37,900
Non-Federally Insured State Chartered	44	2,464	2,245
Total	**1,537**	**86,072**	**83,634**

Size categories	**# of quarterly observations after cleaning**
Large (TA > $500M)	27,652
Small (TA < $500M)	55,982
Total	**83,634**

NCUA Charter Type / Size categories	Large	Small	**Total**
Federal	12,184	31,305	**43,489**
Federally Insured State Chartered	14,987	22,913	**37,900**
Non-Federally Insured State Chartered	481	1,764	**2,245**
Total	**57,428**	**28,443**	**83,634**

Table 4 Descriptive statistics of variables used in the regressions

Size Category	Variable	Mean	Std. Dev.	Minimum	25%	Median	75%	Maximum
Whole Sample	LLP	0.0010	0.0012	-0.01026	0.000247	0.000662	0.001273	0.02228
	BEGLLA	0.0057	0.0049	0	0.002853	0.004464	0.006982	0.073273
	BEGNPL	0.0060	0.0060	0	0.002352	0.004357	0.007589	0.186993
	ΔNPL	0.0001	0.0027	-0.1786	-0.0007	0.0000	0.0008	0.1798
	NLCO	0.0009	0.0011	-0.0105	0.0003	0.0007	0.0012	0.0266
	LOANS	0.6285	0.1594	0.0754	0.5250	0.6423	0.7457	2.4674
	ΔLOANS	0.0098	0.0270	-0.2084	-0.0030	0.0072	0.0194	1.8969
	UnsecLoans	0.0615	0.0374	0.0000	0.0351	0.0566	0.0810	0.4972
	CarLoans	0.2232	0.1319	0	0.1266	0.2022	0.2991	0.9750
	RealEstate	0.3055	0.1452	0	0.1976	0.2927	0.4011	1.6716
	OtherLoans	0.0383	0.0514	0	0.0100	0.0242	0.0491	0.9683
	DLLP	0.0000	0.0008	-0.0142	-0.0003	-0.00002	0.00028	0.01359
	EBLLP	0.0041	0.0032	-0.0429	0.0025	0.0039	0.0056	0.0477
	ΔEBLLP	-0.000046	0.0034	-0.1501	-0.0009	0.0000	0.0009	0.0150
	lnTA	19.33	0.9999	17.74	18.55	19.14	19.95	23.94
	ΔlnTA	0.0139	0.0348	-0.3902	-0.0037	0.0106	0.0277	1.5510
	ROAA	0.60	0.7112	-3	0.27	0.63	0.99	3
	NW	10.97	2.87	1.42	9.06	10.4	12.2	29.83
	Stat	0.52	0.50	0	0	1	1	1
Large	LLP	0.0011	0.0013	-0.0047	0.0003	0.0008	0.0014	0.0168
	BEGLLA	0.0063	0.0052	0	0.0032	0.0050	0.0076	0.0733
	BEGNPL	0.0057	0.0061	0	0.0022	0.0040	0.0071	0.0912
	ΔNPL	0.0001	0.0021	-0.0574	-0.0005	0.0001	0.0007	0.0373
	NLCO	0.0010	0.0011	-0.0069	0.0004	0.0008	0.0013	0.0266
	LOANS	0.6648	0.1566	0.0916	0.5647	0.6780	0.7807	2.3788
	ΔLOANS	0.0137	0.0306	-0.1558	0.0006	0.0113	0.0237	1.4999
	UnsecLoans	0.0600	0.0349	0.0000	0.0343	0.0561	0.0804	0.2992
	CarLoans	0.2275	0.1364	0	0.1270	0.2077	0.3075	0.8583

	RealEstate	0.3408	0.1458	0	0.2335	0.3325	0.4373	1.6716
	OtherLoans	0.0365	0.0504	0	0.0088	0.0218	0.0454	0.7894
	DLLP	0.0001	0.0008	-0.0143	-0.0002	0.0000	0.0003	0.0111
	EBLLP	0.00484	0.002903	-0.02642	0.00326	0.00459	0.0061	0.0462
	ΔEBLLP	-0.0000132	0.003001	-0.04192	-0.00074	0.0000	0.0008	0.0132
	lnTA	20.4580	0.7670	18.2871	19.9406	20.3398	20.8856	23.9422
	ΔlnTA	0.0181	0.0357	-0.2946	0.0009	0.0145	0.0311	1.5046
	ROAA	0.77	0.6723	-3	0.47	0.8	1.13	3
	NW	10.59	2.33	1.42	9.07	10.2	11.65	25
	Stat	0.44	0.50	0	0	0	1	1
Small	LLP	0.0009	0.0012	-0.0103	0.0002	0.0006	0.0012	0.0223
	BEGLLA	0.0055	0.0048	0	0.0027	0.0042	0.0067	0.0723
	BEGNPL	0.0061	0.0059	0	0.0024	0.0045	0.0078	0.1870
	ΔNPL	0.0001	0.0029	-0.1786	-0.0008	0.0000	0.0009	0.1798
	NLCO	0.0009	0.0010	-0.0105	0.0003	0.0006	0.0011	0.0210
	LOANS	0.6106	0.1577	0.0754	0.5067	0.6251	0.7275	2.4674
	ΔLOANS	0.0078	0.0247	-0.2084	-0.0045	0.0053	0.0170	1.8969
	UnsecLoans	0.0622	0.0385	0.0000	0.0354	0.0569	0.0813	0.4972
	CarLoans	0.2211	0.1296	0	0.1264	0.1997	0.2942	0.9750
	RealEstate	0.2881	0.1417	0	0.1826	0.2750	0.3799	1.3101
	OtherLoans	0.0393	0.0519	0	0.0107	0.0253	0.0506	0.9683
	DLLP	0.0000	0.0008	-0.0124	-0.0004	-0.0001	0.0003	0.0136
	EBLLP	0.00374	0.00328	-0.04288	0.0021	0.00355	0.0052	0.0477
	ΔEBLLP	-0.0000614	0.00364	-0.15014	-0.00096	0.0000	0.00096	0.01496
	lnTA	18.7738	0.5150	17.7385	18.3606	18.7400	19.1603	20.2240
	ΔlnTA	0.0118	0.0341	-0.3902	-0.0059	0.0085	0.0258	1.5510
	ROAA	0.52	0.71525	-3	0.2	0.54	0.91	3
	NW	11.16	3.09	1.89	9.05	10.54	12.55	29.83
	Stat	0.56	0.50	0	0	1	1	1

Table 5 Correlations between variables (Lower Pearson's correlation, upper Spearman's correlation)

	LLP	BEGLLA	BEGNPL	ΔNPL	NLCO	LOANS	ΔLOANS	DLLP	EBLLP	ΔEBLLP	lnTA	ΔlnTA	ROAA	NW	Stat
LLP	**1**	0.4122	0.4631	0.0470	0.7468	0.3186	-0.0312	0.4338	0.2121	0.0437	0.1130	-0.0183	-0.1992	-0.1658	-0.0473
		(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
BEGLLA	0.3946	**1**	0.5437	-0.0669	0.599	0.2595	-0.1052	0.0912	0.1488	-0.0218	0.1475	-0.0199	0.0244	-0.1805	-0.1286
	(0.00)		*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
BEGNPL	0.4335	0.5658	**1**	-0.1549	0.5429	0.2552	-0.1849	-0.0934	-0.0111	-0.0196	-0.0345	-0.0298	-0.1691	-0.1805	-0.0470
	(0.00)	*(0.00)*		*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
ΔNPL	0.0264	-0.0926	-0.2252	**1**	-0.0805	0.0729	0.1469	-0.0362	0.0104	0.0242	0.0100	-0.0917	0.0121	0.0263	0.0023
	(0.00)	*(0.00)*	*(0.00)*		*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.50)*
NLCO	0.7178	0.6125	0.5200	-0.1355	**1**	0.2979	-0.1118	0.0226	0.1679	-0.0066	0.1085	-0.0230	-0.1233	-0.2058	-0.0654
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*		*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.06)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
LOANS	0.2603	0.1878	0.2004	0.0556	0.2269	**1**	0.2822	-0.1548	-0.0853	0.0100	0.1484	0.1604	0.1319	-0.2326	-0.1192
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*		*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
ΔLOANS	-0.0424	-0.1338	-0.1465	0.1310	-0.1024	0.2765	**1**	-0.0037	0.0808	0.0856	0.1536	0.0866	0.2116	0.0073	-0.0280
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*		*(0.28)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.04)*	*(0.00)*
DLLP	0.6450	0.0904	-0.0350	-0.0013	0.0526	-0.0658	0.0023	**1**	0.2433	0.0594	0.1345	-0.0456	-0.1337	0.0440	-0.0290
	(0.00)	*(0.00)*	*(0.00)*	*(0.70)*	*(0.00)*	*(0.00)*	*(0.51)*		*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
EBLLP	0.1914	0.1426	0.0081	0.0083	0.1505	-0.1125	0063	0.1887	**1**	0.3472	0.1951	0.0667	0.7541	0.1580	-0.0113
	(0.00)	*(0.00)*	*(0.02)*	*(0.02)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*		*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
ΔEBLLP	0.0605	0.0027	0.0083	0.0115	0.0225	0.0322	0.0462	0.0532	0.4642	**1**	0.0073	-0.0527	0.3207	-0.0117	-0.0005
	(0.00)	*(0.44)*	*(0.02)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*		*(0.03)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
lnTA	0.0802	0.1155	-0.0155	0.0042	0.0667	0.1354	0.0998	0.0981	0.1596	0.0088	**1**	0.1226	0.1726	-0.1077	-0.0960
	(0.00)	*(0.00)*	*(0.00)*	*(0.22)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.01)*		*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*
ΔlnTA	-0.0278	-0.0558	-0.0430	0.0056	-0.0313	0.1807	0.4359	-0.0371	0.0411	0.0209	0.0870	**1**	0.1514	-0.0613	-0.0107
	(0.00)	*(0.00)*	*(0.00)*	*(0.10)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*		*(0.00)*	*(0.00)*	*(0.00)*
ROAA	-0.3408	0.0001	-0.1767	0.0031	0.20	0.0931	0.1343	-0.2506	0.7270	0.4045	0.1446	0.0813	**1**	0.1643	-0.0327
	(0.00)	*(0.97)*	*(0.00)*	*(0.38)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*		*(0.00)*	*(0.00)*
NW	-0.1476	-0.1482	-0.1379	0.0211	-0.1790	-0.2701	-0.0145	0.0130	0.1380	-0.0281	-0.1370	-0.0552	0.1237	**1**	-0.0242
	(0.00)	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*		*(0.00)*
Stat	-0.0412	-0.1005	-0.0368	0.0014	-0.0551	-0.1220	-0.0308	-0.0245	-0.007	-0.0024	-0.0881	-0.0152	-0.0289	-0.0027	**1**
	(0.00)	*(0.00)*	*(0.00)*	*(0.69)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.04)*	*(0.49)*	*(0.00)*	*(0.00)*	*(0.00)*	*(0.44)*	

p-values in parentheses

Table 6 Results of regression of LLP on determinants of normal LLP

	Expected sign	Whole sample	Large	Small	L vs S
BEGLLA	-	-0.054***	-0.052***	-0.057***	-2.47
		(-54.56)	(-30.17)	(-46.74)	
BEGNPL	+	0.047***	0.055***	0.043***	-7.75
		(62.52)	(41.33)	(47.25)	
ΔNPL	+	0.055***	0.091***	0.044***	-17.62
		(50.85)	(39.02)	(36.09)	
NLCO	+	0.691***	0.739***	0.663***	-9.07
		(178.11)	(106.54)	(142.11)	
LOANS	+	0.001***	0.002***	0.001***	-2.19
		(9.96)	(8.17)	(6.64)	
ΔLOANS	?	-0.001***	-0.001***	-0.002***	-1.45
		(-12.77)	(-8.07)	(-11.07)	
UnsecLoans	?	0.003***	0.004***	0.003***	-0.95
		(14.65)	(9.21)	(11.67)	
CarLoans	?	0.000***	0.000	0.001***	2.99
		(3.57)	(0.09)	(4.88)	
RealEstateLoans	?	-0.000***	-0.001***	-0.000**	1.65
		(-3.93)	(-3.89)	(-2.15)	
ΔlnGSP	+	-0.002***	-0.003***	-0.001***	2.50
		(-6.69)	(-5.81)	(-3.72)	
ΔUnemp (%)	+	0.000***	0.000***	0.000***	-1.24
		(8.48)	(5.48)	(5.38)	
Constant		-0.001***	-0.001***	-0.001***	
		(-22.89)	(-13.54)	(-18.86)	
Quarter controls		Yes	Yes	Yes	
Observations		83415	27652	55763	
R^2		0.508	0.604	0.463	
Adjusted R^2		0.498	0.596	0.453	

t-values in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 7 Summary statistics differentiating between positive and negative earnings changes

	Negative ΔEBLLP	Positive ΔEBLLP	t-test
	Mean	Mean	p-value
DLLP	-0.0000389 (n = 40,366)	0.0000364 (n = 43,049)	0.00
EBLLP	1109.69 (n = 40,481)	1597.24 (n = 43,153)	0.00
EBLLP (scaled)	0.32% (n = 40,481)	0.49% (n = 43,153)	0.00
DLLP (large)	-0.0000386 (n = 13, 162)	0.0000351 (n = 14,490)	0.00
DLLP (small)	-0.0000379 (n = 27,204)	0.0000361 (n = 28,559)	0.00

Table 8 Results of regression of DLLP on EBLLP and ΔEBLLP

	Expected sign	Whole		Large		Small		L vs S	
EBLLP		0.19154***	0.20366***	0.17389***	0.19661***	0.19881***	0.20666***	11.22	4.51
		(180.42)	(188.91)	(94.05)	(101.86)	(154.12)	(158.60)		
ΔEBLLP	+	0.00865***	0.01116***	0.01394***	0.01716***	0.00685***	0.00916***	-4.29	-4.34
		(11.71)	(13.69)	(9.74)	(10.62)	(7.97)	(9.66)		
lnTA	+	0.00008***	0.00009***	0.00003***	0.00004***	0.00007***	0.00011***	5.32	8.80
		(32.56)	(37.75)	(6.55)	(7.19)	(13.62)	(18.85)		
ΔlnTA		-0.00019***	-0.00008	-0.00047***	-0.00043***	-0.00007	0.00005	3.05	3.37
		(-2.93)	(-1.22)	(-4.49)	(-3.92)	(-0.84)	(0.54)		
ROAA%	-	-0.00094***	-0.00105***	-0.00085***	-0.00099***	-0.00099***	-0.00108***	-15.10	-9.38
		(-206.18)	(-221.81)	(-108.07)	(-120.13)	(-175.81)	(-186.32)		
NW%	+	0.00001***	0.00001***	0.00002***	0.00002***	0.00000***	0.00000***	-9.00	-6.34
		(9.43)	(7.59)	(13.10)	(9.87)	(4.56)	(4.15)		
Stat	-	-0.00006***	-0.00006***	-0.00006***	-0.00007***	-0.00005***	-0.00005***	0.78	1.09
		(-12.54)	(-13.25)	(-8.11)	(-9.29)	(-8.53)	(-8.80)		
PopDensity	-	-0.00000***	-0.00000***	0.00000	0.00000**	-0.00000***	-0.00000***	-3.90	-4.94
		(-6.76)	(-6.10)	(0.60)	(1.98)	(-7.40)	(-7.22)		
Educ_Level	-	0.00068***	0.00057***	0.00074***	0.00059***	0.00073***	0.00063***	-0.04	0.45
		(12.75)	(10.87)	(7.86)	(6.46)	(11.32)	(9.96)		
Constant		-0.00191***	-0.00191***	-0.00126***	-0.00109***	-0.00182***	-0.00222***		
		(-40.31)	(-39.07)	(-12.08)	(-10.01)	(-17.74)	(-20.68)		
Quarter		No	Yes	No	Yes	No	Yes	No	Yes
Observations		83384	83384	27646	27646	55738	55738		
R^2		0.368	0.403	0.327	0.378	0.382	0.411		
Adjusted R^2		0.367	0.403	0.327	0.376	0.382	0.411		

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 9 Results of regression of DLLP on EBLLP and Merge

	Expected sign	Whole		Large		Small		L vs S	
EBLLP		0.18808***	0.20409***	0.16739***	0.19477***	0.19671***	0.20818***	8.61	3.92
		(125.28)	(134.19)	(56.99)	(65.02)	(110.46)	(115.38)		
Merge		-0.00012***	-0.00013***	-0.00011***	-0.00012***	-0.00012***	-0.00012***	-0.54	0.13
		(-11.92)	(-12.95)	(-5.37)	(-6.35)	(-10.01)	(-10.20)		
EBLLP*Merge		0.02606***	0.02877***	0.02503***	0.02969***	0.02381***	0.02457***	-0.32	-1.25
		(13.29)	(15.07)	(6.99)	(8.59)	(9.67)	(10.19)		
lnTA	+	0.00009***	0.00008***	0.00007***	0.00002***	0.00015***	0.00011***	6.74	7.87
		(26.67)	(24.25)	(8.59)	(3.10)	(18.26)	(14.40)		
ΔlnTA		-0.00024**	0.00024**	-0.00026*	0.00008	-0.00025**	0.00025*	0.07	0.79
		(-2.48)	(2.33)	(-1.65)	(0.49)	(-2.06)	(1.85)		
ROAA%	-	-0.00100***	-0.00110***	-0.00089***	-0.00104***	-0.00104***	-0.00113***	-10.93	-6.57
		(-155.85)	(-166.21)	(-81.67)	(-90.32)	(-132.27)	(-138.52)		
NW%	+	0.00001***	0.00001***	0.00003***	0.00002***	0.00001***	0.00001***	-8.34	-5.03
		(10.79)	(9.48)	(13.09)	(9.38)	(6.20)	(6.36)		
Stat	-	-0.00005***	-0.00006***	-0.00007***	-0.00007***	-0.00004***	-0.00004***	0.01	0.42
		(-8.14)	(-9.20)	(-6.02)	(-6.72)	(-5.12)	(-5.61)		
PopDensity	-	-0.00000***	-0.00000***	-0.00000	0.00000	-0.00000***	-0.00000***	-3.30	-4.42
		(-6.88)	(-5.80)	(-0.13)	(1.42)	(-7.16)	(-6.73)		
Educ_Level	-	0.00080***	0.00058***	0.00090***	0.00067***	0.00082***	0.00064***	-0.34	-0.04
		(10.55)	(7.76)	(6.56)	(5.05)	(9.02)	(7.19)		
Constant		-0.00227***	-0.00238***	-0.00209***	-0.00147***	-0.00326***	-0.00297***		
		(-33.28)	(-33.34)	(-12.86)	(-8.93)	(-21.44)	(-19.21)		
Quarter		No	Yes	No	Yes	No	Yes	No	Yes
Observations		46299	46299	15576	15576	30723	30723		
R^2		0.371	0.405	0.325	0.374	0.387	0.413		
Adjusted R^2		0.371	0.404	0.324	0.372	0.386	0.412		

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 10 Variables' regulatory codes and SNL keys

Symbol	Acct Code	SNL Name	SNL Key
LLP	300	Provision for Loan & Lease Losses	215420
LLA	719	Total Reserves	215372
NPL	041B	Delinquent Lonas: >= 60 Days	214003
ΔNPL		$NPL_t - NPL_{t-1}$	
NLCO	550 - 551	Total Loan Charge-Offs – Total Loan Recoveries	214054 - 214060
LOANS	025B	Total Loans & Leases	216900
$\Delta LOANS$		$LOANS_t – LOANS_{t-1}$	
DLLP		Error of model 1	
EBLLP	661A-300	Net Income - Provision for Loan & Lease Losses	216878 - 215420
$\Delta EBLLP$		$EBLLP_t – EBLLP_{t-1}$	
lnA	10	Natural logarithm of Total Assets	215382
ΔlnA		$lnA_t - lnA_{t-1}$	
ROAA		Return on Average Assets	205264
NW	998	Net Worth Ratio	214532
STAT		NCUA Charter Type	205240
$\Delta lnGSP$		Change in natural logarithm of Gross Domestic Product at the State level – Bureau of Economic Analysis	
$\Delta Unemployment$		Change in the seasonally non-adjusted unemployment rate from prior year at the State, MSA or County level	259656
Pop_density		Population density at the State, or MSA or County level	250886
Educ_att		% of population age 25 years and older with Bachelor degree or more at the State, MSA or County level	

Table 11 Loan categories

Variables	Symbol	Acct Code	Acct Name	SNL Key
UnsecLoans	CC	396	Unsecured credit card loans & Lines of Credit	213696
	UL	397	All other Unsecured loans/lines of credit	213697
CarLoans	NVL	385	New vehicle loans	213698
	UVL	370	Used Vehicle Loans	213699
RealEstateLoans	REL	703	Total 1st Mortgage Real estate loans/ lines of credit	215793
	ORE	386	Other RE Loans & Lines of Credit	213704
OtherLoans	PAL	397A	Payday alternative loans (PAL loans) (Federal CU only)	228101
	STD	698A	Non-Federally Guaranteed Student Loans	231964
	LR	002	Leases Receivable	213731
	OL	698	All Other Loans & LOC to Members	213732

Appendix 2

Table 12 Variable definition

Symbol	SNL Name	SNL Key
LLP	Provision for Loan & Lease Losses	215420
NPL	Delinquent Lonas: >= 60 Days	214003
NLCO	Total Loan Charge-Offs – Total Loan Recoveries	214054 - 214060
LOANS	Total Loans & Leases	216900
EBLLP	Net Income - Provision for Loan & Lease Losses	216878 - 215420
lnTA	Natural logarithm of Total Assets	215382
ΔlnTA	lnA_t- lnA_{t-1}	
ROA	ROAA	205264
NW	Net Worth Ratio	214532
STAT	Charter Type	205240
Unemployment	Change in the seasonally non-adjusted unemployment rate from prior year at the State, MSA or County level	259656

Table 13 Descriptive statistics for credit unions

	N	Mean	Std. dev.	Min.	25th percentile	Median	75th percentile	Max.
Z-score	13,141	-4.0151	0.5708	-5.7169	-4.3845	-4.0359	-3.6910	1.1892
NCO	13,118	0.0015	0.0020	-0.0196	0.0004	0.0010	0.0018	0.0406
NPL	13,152	0.0104	0.0102	0.0000	0.0041	0.0076	0.0131	0.1240
HHI	13,152	0.2727	0.1891	0.0552	0.1410	0.2211	0.3517	0.9978
LI	13,151	0.1483	0.1049	-0.1913	0.0855	0.1521	0.2168	0.3878
STAT	13,152	0.5426	0.4982	0	0	1	1	1
lnTA	13,152	19.1113	1.1433	15.9946	18.2711	19.0036	19.8820	24.3428
ΔlnTA	13,152	0.0124	0.0352	-0.3121	-0.0046	0.0091	0.0253	0.9779
ROA	13,152	0.1420	0.1576	-0.3740	0.0594	0.1399	0.2227	2.6316
EA	13,152	0.1068	0.0299	0.0553	0.0861	0.0997	0.1198	0.2113
KA	13,152	10.8902	3.1344	-1.8600	8.8200	10.1350	12.1900	34.8700
EBLLP	13,152	0.0038	0.0026	-0.0033	0.0022	0.0035	0.0053	0.0123
Deposits	13,152	1.6216	0.6039	0.7393	1.2329	1.4505	1.7770	4.2827
LoanGrowth	13,152	1.3222	3.0792	-5.5146	-0.6274	1.1044	2.9565	12.5754
LoanRatio	13,152	0.5975	0.1586	0.1009	0.4972	0.6122	0.7164	0.9754
RealEstate	13,152	0.4843	0.2128	0.0000	0.3279	0.4860	0.6376	0.9944
Consumer	13,152	0.4532	0.2005	0.0027	0.3082	0.4449	0.5898	1.0000
Commercial	13,152	0.0625	0.0725	0.0000	0.0173	0.0400	0.0825	0.7533

Table 14 Descriptive statistics for commercial banks

	N	Mean	Std. dev.	Min.	25th percentile	Median	75th percentile	Max.
Z-score	13,087	-3.9848	0.8845	-6.1791	-4.6132	-4.0227	-3.3935	2.6403
NCO	13,124	0.0010	0.0034	-0.0273	0.0000	0.0000	0.0008	0.1131
NPL	13,124	0.0198	0.0288	0.0000	0.0026	0.0099	0.0249	0.3174
HHI	13,124	0.2730	0.1892	0.0552	0.1410	0.2214	0.3519	0.9978
LI	13,080	0.1745	0.2150	-0.8349	0.0833	0.1958	0.3028	0.6349
STAT	13,124	0.8293	0.3762	0	1	1	1	1
lnTA	13,124	19.0394	1.1062	15.9573	18.2725	18.9850	19.7201	24.2671
ΔlnTA	13,123	0.0135	0.0593	-1.0176	-0.0125	0.0083	0.0326	1.1610
ROA	13,089	0.2153	0.4227	-1.3854	0.0876	0.2131	0.3586	5.5932
EA	13,092	0.1142	0.0374	0.0495	0.0909	0.1052	0.1269	0.2822
KA	13,124	14.9156	3.1584	0.9500	12.3500	15.0000	18.2278	20.0000
EBLLP	13,088	0.0044	0.0056	-0.0136	0.0021	0.0040	0.0062	0.0367
Deposits	13,076	1.4546	0.6776	0.0040	1.1075	1.2591	1.5298	5.3511
LoanGrowth	13,123	1.5168	5.2923	-11.1746	-1.3767	0.9875	3.6822	24.2907
LoanRatio	13,124	0.6470	0.1646	0.0012	0.5598	0.6772	0.7676	1.0554
RealEstate	13,124	0.7626	0.1934	0.0000	0.6901	0.7991	0.8940	1.0210
Consumer	13,077	0.0491	0.1139	0.0000	0.0044	0.0164	0.0447	1.0015
Commercial	13,077	0.1888	0.1617	0.0000	0.0749	0.1592	0.2610	1.0000

Table 15 Correlation matrix (lower Pearson's correlation, upper Spearman's correlation)

	Z-score	*NCO*	*NPL*	*HHI*	*LI*	STAT	lnTA	ΔlnTA	ROA	EA
Z-score	**1**	0.1625***	0.1884***	0.0292***	-0.2184***	0.0436***	-0.0637***	-0.0324***	-0.1841***	-0.3345***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
NCO	0.2369***	1	0.2818***	0.0257***	-0.0590***	-0.1135***	0.1084***	-0.0810***	-0.2249***	-0.1357***
	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
NPL	0.3203***	0.2995***	1	-0.0094	-0.1302***	-0.0039	0.0038	-0.1562***	-0.1897***	-0.0477***
	(0.00)	(0.00)		(0.13)	(0.00)	(0.53)	(0.54)	(0.00)	(0.00)	(0.00)
HHI	0.0083	0.0102*	0.0151**	1	-0.014**	-0.0099	-0.1632***	-0.003	-0.0105*	0.0001
	(0.18)	(0.09)	(0.01)		(0.02)	(0.11)	(0.00)	(0.62)	(0.09)	(0.99)
LI	-0.2649***	-0.0830***	-0.2553***	-0.0187***	1	0.0729***	0.2644***	0.1199***	0.8250***	0.1845***
	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
STAT	0.0446***	-0.0224***	0.0397***	-0.0129**	0.0659***	1	0.0024	0.014**	0.1028***	0.0096
	(0.00)	(0.00)	(0.00)	(0.04)	(0.00)		(0.69)	(0.02)	(0.00)	(0.12)
lnTA	-0.0425***	0.0271***	-0.0226***	-0.1266***	0.2499***	0.0038	1	0.0791***	0.1968***	-0.0892***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.54)		(0.00)	(0.00)	(0.00)
ΔlnTA	-0.0124**	-0.0714***	-0.1411***	-0.0171***	0.1012***	0.0189***	0.0662***	1	0.1390***	-0.0239***
	(0.04)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)
ROA	-0.1590***	-0.2588***	-0.2379***	-0.0283***	0.7020***	0.0756***	0.1370***	0.0996***	1	0.1963***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)
EA	-0.3450***	-0.0814***	-0.0243***	0.0001	0.1336***	-0.0048	-0.1183***	-0.0001	0.1809***	1
	(0.00)	(0.00)	(0.00)	(0.99)	(0.00)	(0. 44)	(0.00)	(0.99)	(0.00)	
KA	-0.3193***	-0.1360***	0.0298***	0.0138**	0.0916***	0.0707***	-0.1733***	-0.0001	0.1388***	0.6746***
	(0.00)	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.99)	(0.00)	(0.00)
EBLLP	-0.1433***	0.008	-0.1375***	-0.0099	0.7894***	0.0425***	0.1716***	0.1266***	0.7706***	0.1756***
	(0.00)	(0.19)	(0.00)	(0.11)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Deposits	-0.1171***	-0.0350***	-0.0878***	0.0302***	-0.1624***	-0.1693***	-0.1613***	0.0614***	-0.1125***	0.0106*
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.08)
LoanGrowth	-0.0330***	-0.1996***	-0.2310***	-0.0161***	0.1036***	0.0223***	0.0845***	0.3536***	0.1142***	0.0356***
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
LoanRatio	0.1649***	0.0205***	0.0451***	-0.0527***	0.1974***	0.1805***	0.1683***	0.0002	0.1169***	-0.0980***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.97)	(0.00)	(0.00)
Unempl	0.0787***	0.1920***	0.2632***	-0.0377***	-0.0972***	-0.0518***	-0.0548***	-0.0449***	-0.1183***	-0.009
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.14)
PercentRural	-0.1955***	-0.0851***	-0.0749***	0.0797***	0.0514***	-0.0182***	-0.3668***	-0.0198***	0.0262***	0.0236***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
RealEstate	-0.0434***	-0.0995***	0.2104***	-0.1022***	-0.0291***	0.1688***	0.1639***	-0.0357***	-0.0691***	0.0235***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Consumer	0.0166***	0.1087***	-0.2163***	0.0656***	-0.0750***	-0.2615***	-0.1420***	0.0006	-0.0746***	-0.0631***
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.92)	(0.00)	(0.00)
Commercial	0.0426***	-0.0263***	0.0309***	0.0570***	0.1905***	0.1880***	-0.0251***	0.0607***	0.2592***	0.0777***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

	KA	EBLLP	Deposits	LoanGrowth	LoanRatio	Unempl	PercentRural	RealEstate	Consumer	Commercial
Risk	-0.3039***	-0.1756***	-0.1037***	-0.0506***	0.1550***	0.0523***	-0.2506***	-0.0599***	-0.0210***	0.0825***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
NCO	-0.3330***	0.0515***	0.0293***	-0.1753***	-0.0178***	0.2218***	-0.0976***	-0.3416***	0.4083***	-0.1931***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
NPL	0.0088	-0.0647***	-0.0661***	-0.2433***	0.0118*	0.3104***	-0.0455***	0.1454***	-0.1221***	0.0196***
	(0.15)	(0.00)	(0.00)	(0.00)	(0.06)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
HHI	0.0221***	0.0352***	0.1027***	-0.0109*	-0.0853***	-0.0231***	0.1382***	-0.1559***	0.1076***	0.1352***
	(0.00)	(0.00)	(0.00)	(0.08)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
LI	0.1531***	0.8765***	-0.2309***	0.1255***	0.2386***	-0.1035***	0.0442***	0.0231***	-0.1244***	0.1780***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
STAT	0.1022***	0.0186***	-0.1988***	0.0167***	0.1794***	-0.0509***	0.0217***	0.1683***	-0.2597***	0.1924***
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
lnTA	-0.1635***	0.1895***	-0.1779***	0.1191***	0.1652***	-0.0621***	-0.3110***	0.1390***	-0.1534***	-0.0688***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
ΔlnTA	-0.0319***	0.1100***	0.0134**	0.2301***	0.0385***	-0.0586***	0.0038	-0.0520***	0.0179***	0.0411***
	(0.00)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.54)	(0.00)	(0.00)	(0.00)
ROA	0.1981***	0.7976***	-0.2307***	0.1601***	0.2367***	-0.1348***	0.0600***	0.0611***	-0.1616***	0.1941***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
EA	0.7043***	0.1863***	-0.0288***	0.0206***	-0.0736***	-0.0422***	-0.0156**	0.0712***	-0.1145***	0.0258***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)
KA	1	0.1531***	0.0428***	-0.0271***	-0.1551***	-0.0228***	0.0391***	0.3787***	-0.4555***	0.2047***
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
EBLLP	0.1392***	1	-0.006	0.1047***	0.0112*	-0.0058	0.0390***	-0.1140***	0.0224***	0.1439***
	(0.00)		(0.34)	(0.00)	(0.07)	(0.35)	(0.00)	(0.00)	(0.00)	(0.00)
Deposits	0.1312***	0.0981***	1	-0.0248***	-0.9388***	0.0841***	0.0628***	-0.2376***	0.3201***	-0.1361***
	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
LoanGrowth	0.0039	0.1067***	0.0166***	1	0.1708***	-0.2093***	-0.0100	-0.0514***	0.0067	0.0411***
	(0.53)	(0.00)	(0.01)		(0.00)	(0.00)	(0.11)	(0.00)	(0.28)	(0.00)
LoanRatio	-0.1998***	-0.0619***	-0.8853***	0.1248***	1	-0.1119***	-0.0508***	0.1674***	-0.2449***	0.1332***
	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Unempl	-0.0173***	-0.0311***	0.0272***	-0.1647***	-0.0775***	1	-0.0778***	0.0696***	-0.0166***	-0.0751***
	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.01)	(0.00)
PercentRural	0.0841***	0.0171***	0.0443***	-0.0386***	-0.0687***	0.0059	1	-0.1297***	0.1548***	0.1899***
	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.34)		(0.00)	(0.00)	(0.00)
RealEstate	0.3159***	-0.1616***	-0.1957***	-0.0411***	0.1766***	0.0675***	-0.1121***	1	-0.8129***	-0.0944***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)
Consumer	-0.3965***	0.0114*	0.2093***	-0.0042	-0.2082***	-0.0146**	0.0527***	-0.8477***	1	-0.3512***
	(0.00)	(0.07)	(0.00)	(0.50)	(0.00)	(0.02)	(0.00)	(0.00)		(0.00)
Commercial	0.1828***	0.2632***	-0.0440***	0.0779***	0.0745***	-0.0880***	0.0981***	-0.1865***	-0.3631***	1
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)

Table 16 Univariate analysis of the measure of risk - ttest of means

	Mean (Credit Unions)	Mean (Banks)	Difference	ttest (p-value)
Z-score	-4.015	-3.98	-0.0303	0.0010
NCO	0.0015	0.00099	0.0004	0.0000
NPL	0.0104	0.0198	-0.0094	0.0000
LI	0.1483	0.1745	-0.0261	0.0000

Table 17 Regression of risk measures on Type

	Z-score	*Z-score*	*NCO*	*NCO*	*NPL*	*NPL*
Type	0.59599***	0.58203***	0.00024***	0.00026***	0.00957***	0.00991***
	(24.32)	(23.77)	(3.00)	(3.25)	(13.51)	(14.01)
STAT	0.06306***	0.06578***	-0.00001	-0.00002	-0.00099***	-0.00108***
	(7.43)	(7.83)	(-0.49)	(-0.52)	(-5.47)	(-5.95)
Type*Stat	-0.22077***	-0.21432***	-0.00005	-0.00005	-0.00074	-0.00088
	(-10.61)	(-10.34)	(-0.69)	(-0.80)	(-1.16)	(-1.38)
lnTA	-0.11441***	-0.12241***	-0.00002	-0.00001	-0.00091***	-0.00073***
	(-25.91)	(-27.62)	(-1.36)	(-0.65)	(-7.90)	(-6.24)
ΔlnTA	0.15848	0.23757*	-0.00036	-0.00005	-0.02645***	-0.02597***
	(1.27)	(1.83)	(-0.41)	(-0.05)	(-5.16)	(-4.87)
ROA	-0.29516***	-0.33250***	-0.00586***	-0.00576***	-0.02423***	-0.02388***
	(-7.28)	(-7.84)	(-15.70)	(-15.36)	(-14.53)	(-14.11)
KA	-0.08569***	-0.08709***	-0.00005***	-0.00005***	-0.00052***	-0.00049***
	(-47.02)	(-48.23)	(-7.44)	(-7.41)	(-8.69)	(-8.13)
EBLLP	3.20945	5.92309***	0.35397***	0.34675***	0.92320***	0.88300***
	(1.47)	(2.64)	(18.88)	(18.25)	(10.19)	(9.58)
Deposits	0.00823	-0.00879	-0.00060***	-0.00057***	-0.00526***	-0.00483***
	(0.53)	(-0.56)	(-6.27)	(-6.02)	(-11.52)	(-10.56)
LoanGrowth	-0.00557***	-0.00724***	-0.00011***	-0.00011***	-0.00077***	-0.00077***
	(-4.30)	(-5.36)	(-15.79)	(-15.06)	(-18.43)	(-17.50)
LoanRatio	0.43085***	0.37479***	0.00063*	0.00067**	-0.00950***	-0.00697***
	(6.89)	(5.93)	(1.91)	(2.02)	(-4.83)	(-3.55)
Unemployment (%)	0.01762***	0.04042***	0.00013***	0.00011***	0.00174***	0.00127***
	(9.69)	(16.84)	(16.83)	(11.76)	(32.10)	(18.49)
Percent Rural	-0.01060***	-0.01082***	-0.00001***	-0.00001***	-0.00011***	-0.00010***
	(-40.07)	(-41.21)	(-15.43)	(-15.23)	(-15.03)	(-14.40)
RealEstate	-0.39402***	-0.43492***	-0.00127***	-0.00124***	0.00003	0.00067
	(-9.23)	(-10.10)	(-6.13)	(-6.01)	(0.03)	(0.58)
Consumer	-0.11412**	-0.17660***	-0.00003	0.00004	-0.00940***	-0.00802***
	(-2.47)	(-3.77)	(-0.11)	(0.19)	(-7.47)	(-6.37)
Constant	-0.90410***	-0.97360***	0.00264***	0.00220***	0.04407***	0.03999***
	(-7.55)	(-7.99)	(4.31)	(3.63)	(12.35)	(11.05)
Quarter Control	No	Yes	No	Yes	No	Yes
Observations	26183	26183	26162	26162	26196	26196
R^2	0.241	0.248	0.265	0.271	0.233	0.240
Adjusted R^2	0.240	0.246	0.265	0.270	0.233	0.238

Table 18 Regression of risk measures on *HHI* as a measure of competition

	Z-score	*Z-score*	*NCO*	*NCO*	*NPL*	*NPL*
Type	0.57313***	0.56252***	0.00020**	0.00022**	0.00826***	0.00854***
	(21.57)	(21.18)	(2.16)	(2.35)	(10.10)	(10.47)
HHI	-0.18454***	-0.16727***	-0.00017**	-0.00019**	-0.00022	-0.00073
	(-7.29)	(-6.63)	(-2.08)	(-2.33)	(-0.39)	(-1.25)
Type**HHI*	0.04575	0.03934	0.00015	0.00016	0.00510***	0.00525***
	(1.15)	(0.99)	(0.98)	(1.04)	(3.39)	(3.50)
STAT	0.06936***	0.07147***	-0.00001	-0.00001	-0.00098***	-0.00106***
	(8.22)	(8.54)	(-0.44)	(-0.47)	(-5.42)	(-5.85)
Type*Stat	-0.22284***	-0.21675***	-0.00005	-0.00005	-0.00084	-0.00098
	(-10.74)	(-10.48)	(-0.69)	(-0.81)	(-1.33)	(-1.55)
lnTA	-0.11424***	-0.12173***	-0.00002	-0.00001	-0.00087***	-0.00069***
	(-25.84)	(-27.42)	(-1.36)	(-0.64)	(-7.57)	(-5.91)
ΔlnTA	0.16199	0.23787*	-0.00035	-0.00004	-0.02621***	-0.02574***
	(1.30)	(1.83)	(-0.40)	(-0.05)	(-5.11)	(-4.83)
ROA	-0.29536***	-0.33124***	-0.00586***	-0.00575***	-0.02411***	-0.02375***
	(-7.29)	(-7.82)	(-15.72)	(-15.37)	(-14.44)	(-14.02)
KA	-0.08623***	-0.08751***	-0.00005***	-0.00005***	-0.00051***	-0.00048***
	(-48.09)	(-49.13)	(-7.37)	(-7.34)	(-8.48)	(-7.94)
EBLLP	2.95988	5.57552**	0.35384***	0.34653***	0.91804***	0.87700***
	(1.36)	(2.49)	(18.88)	(18.25)	(10.12)	(9.50)
Deposits	0.01111	-0.00492	-0.00060***	-0.00057***	-0.00519***	-0.00475***
	(0.72)	(-0.31)	(-6.27)	(-6.01)	(-11.37)	(-10.40)
LoanGrowth	-0.00569***	-0.00730***	-0.00011***	-0.00011***	-0.00077***	-0.00077***
	(-4.41)	(-5.41)	(-15.80)	(-15.07)	(-18.40)	(-17.47)
LoanRatio	0.44204***	0.39080***	0.00063*	0.00068**	-0.00913***	-0.00659***
	(7.08)	(6.20)	(1.91)	(2.04)	(-4.64)	(-3.36)
Unemployment (%)	0.01616***	0.03764***	0.00013***	0.00011***	0.00175***	0.00127***
	(8.89)	(15.66)	(16.78)	(11.57)	(32.01)	(18.40)
Percent Rural	-0.01651***	-0.01627***	-0.00002***	-0.00002***	-0.00011***	-0.00012***
	(-32.42)	(-32.03)	(-10.94)	(-11.12)	(-7.69)	(-8.17)
HHI *Rural	0.01917***	0.01777***	0.00001**	0.00001**	0.00000	0.00004
	(14.16)	(13.20)	(2.04)	(2.38)	(0.03)	(0.95)
RealEstate	-0.39071***	-0.42929***	-0.00127***	-0.00123***	0.00031	0.00095
	(-9.19)	(-10.01)	(-6.11)	(-5.99)	(0.26)	(0.81)
Consumer	-0.14328***	-0.19981***	-0.00003	0.00004	-0.00908***	-0.00774***
	(-3.12)	(-4.29)	(-0.13)	(0.16)	(-7.11)	(-6.07)
Constant	-0.84032***	-0.91668***	0.00270***	0.00227***	0.04251***	0.03867***
	(-6.96)	(-7.46)	(4.36)	(3.70)	(11.81)	(10.58)
Quarter Control	No	Yes	No	Yes	No	Yes
Observations	26183	26183	26162	26162	26196	26196
R^2	0.246	0.252	0.265	0.271	0.234	0.241
Adjusted R^2	0.245	0.250	0.265	0.270	0.234	0.239

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 19 Regression of risk measures on *LI* as a measure of competition

	Z-score	*Z-score*	*NCO*	*NCO*	*NPL*	*NPL*
Type	0.59273***	0.57116***	0.00036***	0.00037***	0.01156***	0.01169***
	(22.81)	(22.06)	(3.60)	(3.63)	(14.73)	(14.90)
LI	-1.54297***	-1.61213***	-0.00124***	-0.00125***	-0.03460***	-0.03519***
	(-17.30)	(-17.55)	(-2.99)	(-3.03)	(-13.85)	(-13.71)
Type**LI*	-0.60408***	-0.59278***	-0.00154***	-0.00146***	-0.03138***	-0.03042***
	(-9.92)	(-9.68)	(-5.10)	(-4.84)	(-15.02)	(-14.54)
STAT	0.04071***	0.04332***	-0.00004	-0.00004	-0.00164***	-0.00171***
	(4.81)	(5.18)	(-1.46)	(-1.45)	(-9.12)	(-9.49)
Type*Stat	-0.16510***	-0.15607***	0.00003	0.00002	0.00101	0.00088
	(-8.41)	(-8.00)	(0.44)	(0.33)	(1.59)	(1.40)
lnTA	-0.08821***	-0.09680***	0.00000	0.00001	-0.00027**	-0.00013
	(-20.70)	(-22.65)	(0.30)	(0.81)	(-2.33)	(-1.07)
ΔlnTA	0.20975*	0.28795**	-0.00027	0.00003	-0.02435***	-0.02404***
	(1.84)	(2.44)	(-0.31)	(0.03)	(-5.38)	(-5.10)
ROA	-0.13708***	-0.17932***	-0.00560***	-0.00551***	-0.01887***	-0.01878***
	(-4.46)	(-5.66)	(-15.13)	(-14.85)	(-13.60)	(-13.33)
KA	-0.08279***	-0.08421***	-0.00005***	-0.00005***	-0.00051***	-0.00048***
	(-45.76)	(-46.98)	(-7.37)	(-7.33)	(-8.82)	(-8.27)
EBLLP	56.01453***	61.21656***	0.41265***	0.40506***	2.32885***	2.30324***
	(20.04)	(21.07)	(20.31)	(19.47)	(22.08)	(21.37)
Deposits	-0.01748	-0.03864**	-0.00066***	-0.00064***	-0.00605***	-0.00569***
	(-1.17)	(-2.55)	(-6.92)	(-6.69)	(-12.04)	(-11.30)
LoanGrowth	-0.00681***	-0.00884***	-0.00011***	-0.00011***	-0.00080***	-0.00080***
	(-5.84)	(-7.33)	(-16.00)	(-15.24)	(-19.94)	(-19.06)
LoanRatio	0.76989***	0.71484***	0.00086**	0.00088***	-0.00153	0.00068
	(12.53)	(11.55)	(2.57)	(2.64)	(-0.77)	(0.34)
Unemployment (%)	0.01034***	0.03683***	0.00012***	0.00011***	0.00152***	0.00115***
	(5.84)	(15.81)	(16.31)	(11.50)	(29.71)	(17.43)
Percent Rural	-0.00915***	-0.00922***	-0.00001***	-0.00001***	-0.00014***	-0.00014***
	(-25.39)	(-25.73)	(-8.43)	(-8.43)	(-11.71)	(-11.41)
*LI**Rural	0.00305*	0.00232	0.00001	0.00001	0.00052***	0.00052***
	(1.89)	(1.44)	(0.83)	(0.88)	(8.48)	(8.50)
RealEstate	-0.28035***	-0.32316***	-0.00120***	-0.00117***	0.00269**	0.00318***
	(-7.05)	(-8.05)	(-6.21)	(-6.12)	(2.47)	(2.93)
Consumer	-0.11621***	-0.18974***	-0.00008	-0.00003	-0.00999***	-0.00888***
	(-2.76)	(-4.45)	(-0.37)	(-0.12)	(-8.43)	(-7.48)
Constant	-1.60934***	-1.69589***	0.00207***	0.00165***	0.02737***	0.02362***
	(-13.83)	(-14.37)	(3.41)	(2.78)	(7.74)	(6.59)
Quarter Control	No	Yes	No	Yes	No	Yes
Observations	26174	26174	26153	26153	26187	26187
R^2	0.304	0.314	0.272	0.277	0.299	0.304
Adjusted R^2	0.304	0.312	0.271	0.276	0.299	0.303

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 20 Regression of risk measures on square of *HHI*

	Z-score	*Z-score*	*NCO*	*NCO*	*NPL*	*NPL*
Type	0.52424***	0.51490***	0.00029**	0.00031***	0.01269***	0.01292***
	(16.80)	(16.52)	(2.55)	(2.70)	(12.85)	(13.13)
HHI	0.10105	0.11638	0.00088***	0.00086***	0.01702***	0.01630***
	(1.36)	(1.58)	(3.43)	(3.37)	(10.21)	(9.73)
Type**HHI*	0.36048***	0.34554***	-0.00060	-0.00058	-0.02795***	-0.02742***
	(2.89)	(2.78)	(-1.30)	(-1.28)	(-7.05)	(-6.94)
HHI^2	-0.31519***	-0.31328***	-0.00121***	-0.00122***	-0.02052***	-0.02026***
	(-4.28)	(-4.28)	(-4.65)	(-4.68)	(-12.48)	(-12.25)
Type* HHI^2	-0.37706***	-0.36683***	0.00089*	0.00088*	0.03940***	0.03894***
	(-2.77)	(-2.69)	(1.79)	(1.79)	(8.02)	(7.97)
STAT	0.06815***	0.07027***	-0.00002	-0.00002	-0.00103***	-0.00112***
	(8.08)	(8.41)	(-0.57)	(-0.60)	(-5.72)	(-6.15)
Type*Stat	-0.22074***	-0.21470***	-0.00004	-0.00005	-0.00086	-0.00100
	(-10.65)	(-10.39)	(-0.65)	(-0.77)	(-1.36)	(-1.59)
lnTA	-0.11383***	-0.12131***	-0.00002	-0.00001	-0.00090***	-0.00071***
	(-25.89)	(-27.48)	(-1.39)	(-0.66)	(-7.79)	(-6.13)
ΔlnTA	0.16500	0.24082*	-0.00035	-0.00004	-0.02628***	-0.02580***
	(1.33)	(1.85)	(-0.40)	(-0.05)	(-5.13)	(-4.85)
ROA	-0.29543***	-0.33118***	-0.00586***	-0.00575***	-0.02402***	-0.02367***
	(-7.27)	(-7.80)	(-15.70)	(-15.35)	(-14.44)	(-14.01)
KA	-0.08602***	-0.08730***	-0.00005***	-0.00005***	-0.00052***	-0.00049***
	(-47.91)	(-48.95)	(-7.33)	(-7.30)	(-8.59)	(-8.05)
EBLLP	2.82098	5.42881**	0.35361***	0.34628***	0.91742***	0.87648***
	(1.29)	(2.42)	(18.89)	(18.25)	(10.14)	(9.52)
Deposits	0.00882	-0.00713	-0.00060***	-0.00057***	-0.00517***	-0.00473***
	(0.57)	(-0.45)	(-6.29)	(-6.02)	(-11.30)	(-10.34)
LoanGrowth	-0.00576***	-0.00736***	-0.00011***	-0.00011***	-0.00077***	-0.00077***
	(-4.46)	(-5.45)	(-15.80)	(-15.07)	(-18.43)	(-17.50)
LoanRatio	0.44402***	0.39283***	0.00064*	0.00068**	-0.00918***	-0.00665***
	(7.11)	(6.23)	(1.92)	(2.04)	(-4.67)	(-3.39)
Unemployment (%)	0.01610***	0.03750***	0.00013***	0.00011***	0.00175***	0.00127***
	(8.86)	(15.61)	(16.75)	(11.55)	(32.05)	(18.44)
Percent Rural	-0.01620***	-0.01597***	-0.00002***	-0.00002***	-0.00011***	-0.00012***
	(-31.76)	(-31.37)	(-10.60)	(-10.77)	(-7.82)	(-8.30)
*HHI*Rural	0.01736***	0.01599***	0.00001	0.00001*	0.00000	0.00004
	(12.57)	(11.64)	(1.37)	(1.69)	(0.05)	(0.99)
RealEstate	-0.37174***	-0.41048***	-0.00125***	-0.00121***	0.00011	0.00075
	(-8.75)	(-9.57)	(-6.03)	(-5.91)	(0.10)	(0.65)
Consumer	-0.13509***	-0.19168***	-0.00005	0.00002	-0.00997***	-0.00863***
	(-2.94)	(-4.11)	(-0.22)	(0.08)	(-7.88)	(-6.82)
Constant	-0.89957***	-0.97471***	0.00256***	0.00213***	0.04117***	0.03736***
	(-7.40)	(-7.89)	(4.16)	(3.49)	(11.52)	(10.30)
Quarter Control	No	Yes	No	Yes	No	Yes
Observations	26183	26183	26162	26162	26196	26196
R^2	0.247	0.253	0.266	0.271	0.236	0.243
Adjusted R^2	0.246	0.252	0.265	0.270	0.236	0.241

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 21 Regression of risk measures on square of *LI*

	Z-score	*Z-score*	*NCO*	*NCO*	*NPL*	*NPL*
Type	0.55818***	0.53637***	0.00027***	0.00028***	0.01075***	0.01087***
	(21.42)	(20.73)	(2.76)	(2.83)	(13.74)	(13.91)
LI	-2.15614***	-2.29808***	-0.00343***	-0.00322***	-0.04698***	-0.04685***
	(-17.82)	(-18.79)	(-6.37)	(-5.95)	(-15.10)	(-14.63)
Type*L*LI*	0.12307	0.20436**	0.00096**	0.00079*	-0.01634***	-0.01614***
	(1.26)	(2.11)	(2.02)	(1.65)	(-5.73)	(-5.61)
LI^2	2.98090***	3.25726***	0.01014***	0.00914***	0.06184***	0.05885***
	(9.52)	(10.51)	(7.48)	(6.75)	(8.82)	(8.27)
Type*LI^2	-2.44132***	-2.72186***	-0.00873***	-0.00779***	-0.04931***	-0.04631***
	(-7.53)	(-8.47)	(-6.03)	(-5.38)	(-6.17)	(-5.74)
STAT	0.04673***	0.04986***	-0.00002	-0.00002	-0.00152***	-0.00160***
	(5.53)	(5.97)	(-0.77)	(-0.83)	(-8.47)	(-8.88)
Type*Stat	-0.17425***	-0.16580***	0.00000	-0.00000	0.00082	0.00071
	(-8.85)	(-8.47)	(0.00)	(-0.06)	(1.29)	(1.12)
lnTA	-0.09334***	-0.10218***	-0.00001	-0.00000	-0.00039***	-0.00024**
	(-21.84)	(-23.86)	(-0.63)	(-0.05)	(-3.40)	(-2.11)
ΔlnTA	0.21708*	0.29032**	-0.00025	0.00004	-0.02417***	-0.02398***
	(1.91)	(2.48)	(-0.28)	(0.05)	(-5.38)	(-5.12)
ROA	-0.15134***	-0.19558***	-0.00564***	-0.00555***	-0.01920***	-0.01914***
	(-5.00)	(-6.25)	(-15.28)	(-15.00)	(-14.02)	(-13.75)
KA	-0.08496***	-0.08653***	-0.00006***	-0.00006***	-0.00055***	-0.00052***
	(-46.80)	(-48.12)	(-8.22)	(-8.09)	(-9.44)	(-8.88)
EBLLP	53.07386***	58.49833***	0.40491***	0.39826***	2.26025***	2.23821***
	(18.60)	(19.71)	(20.46)	(19.60)	(21.98)	(21.26)
Deposits	-0.03617**	-0.05796***	-0.00071***	-0.00069***	-0.00647***	-0.00612***
	(-2.36)	(-3.73)	(-7.26)	(-7.02)	(-12.16)	(-11.47)
LoanGrowth	-0.00629***	-0.00828***	-0.00011***	-0.00011***	-0.00078***	-0.00079***
	(-5.41)	(-6.89)	(-15.93)	(-15.16)	(-19.60)	(-18.73)
LoanRatio	0.68435***	0.62907***	0.00062*	0.00066*	-0.00347*	-0.00123
	(10.70)	(9.76)	(1.83)	(1.95)	(-1.67)	(-0.59)
Unemployment (%)	0.01005***	0.03677***	0.00012***	0.00011***	0.00152***	0.00115***
	(5.67)	(15.82)	(16.15)	(11.47)	(29.68)	(17.49)
Percent Rural	-0.00862***	-0.00870***	-0.00001***	-0.00001***	-0.00013***	-0.00013***
	(-23.86)	(-24.33)	(-7.17)	(-7.21)	(-10.78)	(-10.47)
*LI**Rural	-0.00001	-0.00070	-0.00000	-0.00000	0.00045***	0.00044***
	(-0.01)	(-0.42)	(-0.13)	(-0.04)	(7.65)	(7.64)
RealEstate	-0.24792***	-0.29102***	-0.00111***	-0.00109***	0.00343***	0.00390***
	(-6.29)	(-7.32)	(-5.82)	(-5.76)	(3.08)	(3.52)
Consumer	-0.09575**	-0.16988***	-0.00003	0.00002	-0.00953***	-0.00846***
	(-2.27)	(-3.99)	(-0.11)	(0.10)	(-7.96)	(-7.04)
Constant	-1.42849***	-1.50599***	0.00260***	0.00215***	0.03139***	0.02765***
	(-11.91)	(-12.38)	(4.25)	(3.60)	(8.73)	(7.58)
Quarter Control	No	Yes	No	Yes	No	Yes
Observations	26174	26174	26153	26153	26187	26187
R^2	0.309	0.319	0.275	0.280	0.302	0.306
Adjusted R^2	0.308	0.318	0.274	0.278	0.301	0.305

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 22 Regression of risk measures on both measures of competition

	Z-score	*Z-score*	*NCO*	*NCO*	*NPL*	*NPL*
Type	0.57326***	0.55536***	0.00033***	0.00033***	0.01042***	0.01049***
	(20.39)	(19.83)	(2.99)	(2.98)	(11.80)	(11.90)
LI	-1.53340***	-1.60258***	-0.00123***	-0.00125***	-0.03494***	-0.03552***
	(-17.23)	(-17.48)	(-2.99)	(-3.02)	(-14.00)	(-13.85)
Type**LI*	-0.60292***	-0.59100***	-0.00154***	-0.00145***	-0.03112***	-0.03016***
	(-9.93)	(-9.67)	(-5.10)	(-4.84)	(-14.91)	(-14.43)
HHI	-0.14850***	-0.12615***	-0.00013	-0.00014*	0.00097*	0.00057
	(-5.91)	(-5.04)	(-1.56)	(-1.76)	(1.66)	(0.97)
Type**HHI*	0.03628	0.02885	0.00013	0.00014	0.00437***	0.00449***
	(0.93)	(0.74)	(0.83)	(0.88)	(3.00)	(3.09)
STAT	0.04721***	0.04916***	-0.00004	-0.00004	-0.00163***	-0.00170***
	(5.61)	(5.90)	(-1.40)	(-1.38)	(-9.05)	(-9.38)
Type*Stat	-0.16819***	-0.15954***	0.00003	0.00002	0.00088	0.00076
	(-8.59)	(-8.19)	(0.43)	(0.31)	(1.41)	(1.22)
lnTA	-0.08783***	-0.09592***	0.00000	0.00001	-0.00022*	-0.00007
	(-20.63)	(-22.44)	(0.30)	(0.82)	(-1.87)	(-0.63)
ΔlnTA	0.21327*	0.28862**	-0.00027	0.00003	-0.02412***	-0.02381***
	(1.87)	(2.45)	(-0.31)	(0.04)	(-5.33)	(-5.05)
ROA	-0.13735***	-0.17819***	-0.00560***	-0.00551***	-0.01874***	-0.01865***
	(-4.48)	(-5.63)	(-15.14)	(-14.86)	(-13.51)	(-13.23)
KA	-0.08329***	-0.08457***	-0.00005***	-0.00005***	-0.00050***	-0.00046***
	(-46.71)	(-47.76)	(-7.29)	(-7.25)	(-8.58)	(-8.05)
EBLLP	55.55766***	60.64550***	0.41243***	0.40472***	2.32923***	2.30287***
	(19.93)	(20.93)	(20.31)	(19.47)	(22.09)	(21.37)
Deposits	-0.01387	-0.03411**	-0.00066***	-0.00064***	-0.00596***	-0.00560***
	(-0.93)	(-2.26)	(-6.92)	(-6.68)	(-11.91)	(-11.16)
LoanGrowth	-0.00694***	-0.00890***	-0.00011***	-0.00011***	-0.00079***	-0.00080***
	(-5.96)	(-7.40)	(-16.00)	(-15.24)	(-19.93)	(-19.06)
LoanRatio	0.78244***	0.73169***	0.00086***	0.00089***	-0.00105	0.00116
	(12.78)	(11.86)	(2.58)	(2.66)	(-0.53)	(0.58)
Unemployment (%)	0.00908***	0.03440***	0.00012***	0.00011***	0.00154***	0.00116***
	(5.13)	(14.74)	(16.26)	(11.34)	(29.72)	(17.48)
Percent Rural	-0.01465***	-0.01418***	-0.00002***	-0.00002***	-0.00013***	-0.00014***
	(-25.80)	(-25.05)	(-7.76)	(-7.97)	(-7.76)	(-8.08)
*LI**Rural	0.00274*	0.00207	0.00001	0.00001	0.00052***	0.00051***
	(1.68)	(1.26)	(0.80)	(0.86)	(8.40)	(8.41)
*HHI**Rural	0.01797***	0.01623***	0.00001*	0.00001*	-0.00004	-0.00001
	(13.68)	(12.42)	(1.68)	(1.95)	(-0.99)	(-0.25)
RealEstate	-0.27571***	-0.31635***	-0.00120***	-0.00117***	0.00302***	0.00350***
	(-6.97)	(-7.93)	(-6.19)	(-6.09)	(2.74)	(3.20)
Consumer	-0.14380***	-0.21120***	-0.00009	-0.00003	-0.00963***	-0.00857***
	(-3.44)	(-5.00)	(-0.38)	(-0.13)	(-8.05)	(-7.15)
Constant	-1.56546***	-1.66102***	0.00211***	0.00170***	0.02512***	0.02157***
	(-13.41)	(-14.01)	(3.44)	(2.83)	(7.06)	(5.97)
Quarter Control	No	Yes	No	Yes	No	Yes
Observations	26174	26174	26153	26153	26187	26187
R^2	0.309	0.317	0.272	0.277	0.300	0.305
Adjusted R^2	0.308	0.316	0.271	0.276	0.300	0.304

t statistics in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Appendix 3

Table 23 Reasons for merger

Reason for merger	Frequency	Percentage
Conversion to or merger with FCU	15	0.97%
Conversion to or merger with FISCU	26	1.67%
Conversion to or merger with NFICU	5	0.32%
Expanded services	1,009	64.93%
Inability to obtain officials	51	3.28%
Lack of growth	67	4.31%
Lack of sponsor support	57	3.67%
Loss/declining field of membership	49	3.15%
Poor Financial Condition	240	15.44%
Poor management	35	2.25%
Total	**1,554**	100%

Table 24 Belco vs Cornertsone

Year	*2014 Y*		*2015 Y*		*2016 Y*	
Credit union	**Belco**	**Cornerstone**	**Belco**	**Cornerstone**	**Belco**	**Cornerstone**
Total Assets ($ million)	419,170	98,927	438,560	104,872	453,824	105,406
Total Loans & Leases ($ million)	296,627	66,581	317,897	62,881	338,784	61,313
Total Shares and Deposits ($ million)	353,359	88,554	374,486	94,528	397,254	94,816
Asset Growth Rate (%)	7.58	2.35	4.63	6.01	3.48	0.51
Loan Growth (%)	12.34	4.81	7.17	(5.56)	6.57	(2.49)
Share and Deposit Growth (%)	4.48	2.21	5.98	6.75	6.08	0.30
Net Worth/ Assets (%)	9.03	10.22	9.40	10.07	9.81	10.24
Net Worth Growth (%)	7.08	3.59	8.93	4.43	8.00	2.27
Total Delinquent Loans/ Total Loans (%)	1.06	2.16	1.14	1.78	1.56	0.66
Net Charge Offs/ Average Loans (%)	0.69	0.08	0.67	0.14	0.60	0.23
ROAA (%)	0.62	0.35	0.39	0.44	0.73	0.23
Net Margin/ Average Assets (%)	5.09	3.57	5.08	3.62	5.15	3.53
Operating Expense/ Average Assets (%)	4.32	3.06	4.20	3.14	4.24	3.23
Provision for Loan Losses/ Average Assets (%)	0.53	0.17	0.59	0.04	0.45	0.08
Net Interest Margin (%)	4.28	3.17	4.21	3.06	4.16	3.08
Operating Expense/ Gross Income (%)	77.62	77.43	76.08	79.39	76.51	84.55
Operating Expense/ Operating Revenue (%)	78.95	85.54	81.12	86.77	78.25	91.16
Net Interest Income Before Provisions/ Avg Assets (%)	3.58	2.77	3.57	2.77	3.53	2.69
Noninterest Income/ Average Assets (%)	1.89	0.80	1.61	0.85	1.88	0.85
Noninterest Expense/ Average Assets (%)	4.32	3.06	4.20	3.14	4.24	3.23
Net Long Term Assets/ Assets (%)	33.29	40.86	33.82	39.98	33.00	43.76
Gross Loans/ Assets (%)	70.77	67.30	72.49	59.96	74.65	58.17
Liquid Assets/ Assets (%)	4.73	11.12	4.42	17.93	4.14	14.26
Members/ Potential Members (%)	3.41	4.23	3.50	4.29	3.55	4.40
Members/ Full-Time Employees (x)	377.93	340.94	397.92	330.06	388.33	343.63
Loans/ Deposits (%)	83.94	75.19	84.89	66.52	85.28	64.67
Credit Card and Unsecured Loans/ Loans (%)	16.30	8.69	16.86	8.84	16.41	8.95
Vehicle Loans/ Loans (%)	28.19	20.31	29.62	20.26	30.15	19.85
Real Estate Loans/ Loans (%)	43.43	65.63	43.38	65.41	45.30	65.40

Table 25 California vs North Island

Year	*2014 Y*		*2015 Y*		*2016 Y*	
Credit Union	**California**	**North Island**	**California**	**North Island**	**California**	**North Island**
Total Assets ($ million)	1,334,157	1,143,960	1,463,533	1,182,284	1,596,149	1,258,849
Total Loans & Leases ($ million)	876,492	743,590	1,063,569	837,524	1,205,470	903,489
Total Shares and Deposits ($ million)	1,028,679	1,007,337	1,167,305	1,034,445	1,291,380	1,093,805
Asset Growth Rate (%)	13.64	3.94	9.70	3.35	9.06	6.48
Loan Growth (%)	26.58	8.31	21.34	12.63	13.34	7.88
Share and Deposit Growth (%)	5.12	2.42	13.48	2.69	10.63	5.74
Net Worth/ Assets (%)	10.86	10.69	10.52	11.24	10.04	11.30
Net Worth Growth (%)	17.58	17.07	6.25	8.71	4.06	7.03
Total Delinquent Loans/ Total Loans (%)	1.16	1.55	0.79	0.57	0.72	0.42
Net Charge Offs/ Average Assets (%)	0.35	0.16	0.27	0.21	0.17	0.16
ROAA (%)	1.73	1.57	0.63	0.91	0.40	0.76
Net Margin/ Average Assets (%)	4.72	4.47	4.41	4.54	4.41	4.72
Operating Expense/ Average Assets (%)	3.88	3.50	3.99	3.64	4.25	3.78
Provision for loan Losses/ Average Assets (%)	0.05	(0.56)	0.04	(0.05)	0.03	0.01
Net Interest Margin (%)	3.54	3.36	3.29	3.41	3.36	3.46
Operating Expense/ Gross Income (%)	78.23	76.12	84.24	78.37	89.33	78.28
Operating Expense/ Operating Revenue (%)	68.6	77.51	85.64	80.95	90.81	83.17
Net Interest Income Before Provisions/ Average Assets (%)	3.12	2.67	2.96	2.73	2.99	2.89
Noninterest Income/ Average Assets (%)	2.53	1.84	1.70	1.77	1.69	1.66
Noninterest Expense/ Average Assets (%)	3.88	3.50	3.99	3.64	4.25	3.78
Net long Term Assets/ Assets (%)	48.47	34.43	46.03	39.76	44.13	40.32
Gross Loans/ Assets (%)	65.7	65.00	72.67	70.84	75.52	71.77
Liquid Assets/ Assets (%)	10.7	13.78	9.69	10.55	7.90	11.46
Members/ Potential Members (%)	56.89	0.95	59.13	0.94	61.56	0.92
Members/ Full-Time Employees (x)	323.88	293.77	309.06	292.73	325.14	305.56
Loans/ Deposits (%)	85.21	73.82	91.11	80.96	93.35	82.60
Credit Card and Unsecured Loans/ Loans (%)	6.28	3.26	6.37	4.08	6.79	4.64
Vehicles Loans/ Loans (%)	10.67	17.67	11.60	20.75	12.93	22.29
Real Estate Loans/ Loans (%)	72.76	76.32	67.64	72.83	66.14	70.94

Table 26 Pentagon vs Belvoir

Year	*2013 Y*		*2014 Y*		*2015 Y*	
	Pentagon	**Belvoir**	**Pentagon**	**Belvoir**	**Pentagon**	**Belvoir**
Total Assets ($ million)	16,840,840	310,522	17,796,419	318,505	19,460,442	324,033
Total Loans & Leases ($ million)	14,932,876	213,160	16,272,444	231,201	17,430,495	243,151
Total Shares and Deposits ($ million)	13,428,370	283,369	13,945,219	289,858	15,321,403	294,455
Asset Growth Rate (%)	8.42	3.86	5.67	2.57	9.35	1.74
Loan Growth (%)	8.84	7.09	8.97	8.46	7.12	5.17
Share and Deposit Growth (%)	9.74	5.08	3.85	2.29	9.87	1.59
Net Worth/ Assets (%)	9.94	7.97	10.21	8.16	10.18	8.34
Net Worth Growth (%)	7.47	6.10	8.54	5.00	9.07	3.93
Total Delinquent Loans/ Total Loans (%)	0.29	0.87	0.27	0.82	0.29	0.92
Net Charge Offs/ Average Assets (%)	0.35	0.46	0.29	0.37	0.31	0.37
ROAA (%)	0.72	0.46	0.77	0.39	0.86	0.32
Net Margin/ Average Assets (%)	2.33	4.35	2.25	4.46	2.58	4.50
Operating Expense/ Average Assets (%)	1.32	3.64	1.26	3.80	1.43	3.94
Provision for loan Losses/ Average Assets (%)	0.30	0.25	0.22	0.29	0.29	0.26
Net Interest Margin (%)	1.59	3.29	1.76	3.40	1.96	3.56
Operating Expense/ Gross Income (%)	31.75	73.34	33.33	76.18	36.03	79.41
Operating Expense/ Operating Revenue (%)	56.31	83.75	56.07	84.78	55.54	87.21
Net Interest Income Before Provisions/ Average Assets (%)	1.51	2.83	1.68	2.97	1.87	3.09
Noninterest Income/ Average Assets (%)	0.82	1.52	0.58	1.51	0.71	1.42
Noninterest Expense/ Average Assets (%)	1.32	3.64	1.26	3.80	1.43	3.94
Net long Term Assets/ Assets (%)	17.75	36.34	19.03	30.16	21.73	23.19
Gross Loans/ Assets (%)	88.67	68.65	91.44	72.59	89.57	75.04
Liquid Assets/ Assets (%)	4.09	9.27	1.81	6.43	2.45	9.10
Members/ Potential Members (%)	17.53	43.22	18.01	43.64	18.96	45.24
Members/ Full-Time Employees	945.42	343.48	914.57	342.26	825.58	337.16
Loans/ Deposits (%)	111.20	75.22	116.69	79.76	113.77	82.58
Credit Card and Unsecured Loans/ Loans (%)	12.06	17.32	11.37	17.33	10.72	17.12
Vehicles Loans/ Loans (%)	17.77	37.69	12.92	37.71	13.67	35.70
Real Estate Loans/ Loans (%)	69.19	43.35	74.89	42.85	74.88	41.81

Table 27 Initial sample

Classification	# of Credit unions	# of Observations	# of Observations after cleaning
Target	299	11,960	8,239
Acquiring	241	9,640	9,621
Non-merging	280	11,200	11,200

Table 28 Descriptive statistics

Panel A – Acquired credit unions

	N	mean	sd	min	p25	p50	p75	max
TotalAssets	8239	52781.25	66337.72	10444	17500	29183	59953	717486
TotalLoans	8239	45203.8	57820.74	8490	14570	24687	50578	656128
TotalShares	7342	2232.671	9259.397	0	3	262	1206	128597
AssetGrowthRate (%)	8236	2.54	12.92	-29.62	-5.53	1.41	9.60	44.95
EquityGrowth	8239	-2.02	15.21	-74.19	-4.98	0.48	4.54	34.75
LoanGrowth	8236	-1.92	15.00	-34.78	-11.46	-3.38	5.81	54.80
MemberGrowth	8237	-2.26	8.49	-38.43	-4.87	-1.68	0.89	33.01
ShareGrowth	8239	3.29	14.30	-30.95	-5.74	1.93	11.17	48.77
NetWorthRatio (%)	8239	11.79	4.47	5.31	8.60	10.62	13.96	27.53
DelinquentLoansNWRatio	8238	7.07	8.83	0.00	1.54	4.02	8.86	50.12
ClassifiedAssetsNWRatio	8238	5.92	6.64	0.26	1.90	3.62	7.30	38.37
DelinquentLoansRatio	8239	0.83	0.89	0.00	0.21	0.53	1.13	4.74
DelinquentAssetsRatio	8239	0.70	0.75	0.00	0.18	0.45	0.96	4.03
NCOLoansRatio	8239	0.11	0.16	-0.07	0.01	0.05	0.14	0.86
ROAA	8239	-0.20	1.44	-7.30	-0.48	0.06	0.46	2.94
GrossIncomeAverageAssets	8239	4.94	1.55	1.93	3.75	4.85	5.98	9.08
YieldonLoans	8239	6.26	1.13	3.89	5.50	6.23	6.92	9.53
CostofFundsAverageAssets	8235	0.77	0.67	0.02	0.25	0.53	1.13	2.87
NetMarginAverageAssets	8239	4.17	1.32	1.29	3.26	4.11	4.99	8.01
OperatingExpenseAverageAsset	8239	3.91	1.28	1.10	3.12	3.82	4.58	8.44
ProvisionforLoanLossesAvera	8239	0.38	0.72	-0.77	0.00	0.14	0.45	4.14
NetInterestMargin	8239	3.72	1.05	1.37	2.99	3.66	4.37	6.75
OperatingExpenseGrossIncome	8239	82.02	23.32	31.79	67.33	80.50	93.09	185.42
NetOperatingExpenseAverageA	8239	3.18	1.00	1.02	2.56	3.08	3.66	7.26
LoansAssets	8239	85.04	7.14	61.71	81.04	86.26	90.10	97.30
SharestoEarningsAssets	7342	3.13	8.87	0.00	0.02	1.03	2.82	80.77
BorrowingstoSharesandNetWorth	8239	0.36	1.60	0.00	0.00	0.00	0.00	11.10
MemberstoPotential	8233	0.28	0.26	0.00	0.04	0.21	0.45	0.93
MemberstoEmployees	8218	475.97	172.82	225.79	354.38	438.42	555.25	1128.00
SalaryBenefitsFullTimeEqu	8239	56.95	16.20	31.00	47.00	54.00	64.00	130.00

Panel B – Acquiring credit unions

	N	mean	sd	min	p25	p50	p75	max
TotalAssets	9621	746247.9	2146114	20152	121588	321790	710016	37,300,000
TotalLoans	9621	642198	1689119	17517	106568	279859	620582	26,800,000
TotalShares	8881	58923.94	232618.9	0	2707	12371	44483	4,621,021
AssetGrowthRate (%)	9619	7.61	15.29	-17.99	-0.71	4.91	12.40	94.99
EquityGrowth	9621	6.87	14.78	-35.87	1.61	6.01	10.83	89.54
LoanGrowth	9618	7.40	14.63	-20.78	-1.06	5.81	13.46	81.14
MemberGrowth	9621	4.45	16.71	-29.04	-0.86	2.38	5.82	115.48
ShareGrowth	9621	7.70	16.23	-19.08	-1.42	4.57	13.18	97.49
NetWorthRatio (%)	9621	10.72	2.46	7.02	9.02	10.29	11.90	21.32
DelinquentLoansNWRatio	9621	7.25	6.96	0.37	2.90	5.24	9.04	41.60
ClassifiedAssetsNWRatio	9621	6.92	5.07	0.87	3.51	5.72	8.55	29.10
DelinquentLoansRatio	9621	0.82	0.71	0.05	0.37	0.63	1.04	4.24
DelinquentAssetsRatio	9621	0.71	0.60	0.05	0.32	0.55	0.90	3.54
NCOLoansRatio	9621	0.12	0.11	-0.01	0.05	0.09	0.16	0.57
ROAA	9621	0.55	0.87	-3.23	0.24	0.59	0.96	3.05
GrossIncomeAverageAssets	9621	5.67	1.36	2.82	4.72	5.55	6.55	9.40
YieldonLoans	9621	5.65	1.06	3.43	4.85	5.62	6.39	8.30
CostofFundsAverageAssets	9620	0.85	0.66	0.08	0.38	0.60	1.14	2.85
NetMarginAverageAssets	9621	4.83	1.20	2.22	4.03	4.74	5.52	8.27
OperatingExpenseAverageAsset	9621	3.83	1.04	1.58	3.13	3.76	4.43	7.23
ProvisionforLoanLossesAvera	9621	0.46	0.48	-0.30	0.15	0.34	0.62	2.63
NetInterestMargin	9621	3.78	0.83	2.02	3.23	3.71	4.27	6.31
OperatingExpenseGrossIncome	9621	68.27	13.02	35.67	59.59	68.81	77.03	101.31
NetOperatingExpenseAverageA	9621	2.87	0.79	1.06	2.35	2.82	3.35	5.43
LoansAssets	9621	87.15	5.38	68.83	84.16	87.81	90.99	96.73
SharestoEarningsAssets	8881	5.95	5.43	0.00	2.16	4.28	8.13	26.27
BorrowingstoSharesandNetWorth	9621	2.10	4.00	0.00	0.00	0.00	2.52	19.31
MemberstoPotential	9619	0.18	0.21	0.00	0.03	0.09	0.25	0.94
MemberstoEmployees	9619	397.39	110.71	208.80	319.53	377.01	450.50	840.08
SalaryBenefitsFullTimeEqu	9621	63.29	14.36	39.00	53.00	61.00	71.00	112.00

Panel C – Non-merging credit unions

	N	mean	Sd	min	p25	p50	p75	max
TotalAssets	11200	59338.47	93300.39	11244	18569	31206	62489	1,481,000
TotalLoans	11200	51265.46	79672.85	9323	16053.5	26813.5	53955.5	1,312,306
TotalShares	10346	5440.415	31666.6	0	21	324	1604	522979
AssetGrowthRate (%)	11198	4.22	11.73	-22.81	-3.40	3.06	10.81	41.75
EquityGrowth	11200	2.71	9.90	-37.04	-0.42	2.98	7.14	33.28
LoanGrowth	11180	2.66	14.15	-28.26	-6.53	1.29	10.03	53.69
MemberGrowth	11200	-0.16	7.43	-34.61	-2.58	0.21	2.92	26.62
ShareGrowth	11200	4.50	13.27	-25.74	-4.22	3.02	11.90	46.60
NetWorthRatio (%)	11200	12.12	4.13	6.28	9.18	11.23	14.02	26.60
DelinquentLoansNWRatio	11200	6.18	7.23	0.00	1.52	3.76	8.08	38.95
ClassifiedAssetsNWRatio	11200	5.14	5.18	0.29	1.86	3.50	6.34	29.89
DelinquentLoansRatio	11200	0.78	0.88	0.00	0.21	0.50	1.03	5.00
DelinquentAssetsRatio	11200	0.67	0.75	0.00	0.18	0.43	0.88	4.39
NCOLoansRatio	11200	0.09	0.13	-0.08	0.00	0.04	0.12	0.71
ROAA	11200	0.32	0.95	-3.47	0.02	0.35	0.75	3.17
GrossIncomeAverageAssets	11200	4.94	1.54	1.99	3.83	4.77	5.93	9.30
YieldonLoans	11200	6.11	1.25	3.53	5.20	6.07	6.93	9.53
CostofFundsAverageAssets	11183	0.70	0.64	0.03	0.24	0.45	0.97	2.84
NetMarginAverageAssets	11200	4.24	1.34	1.43	3.33	4.13	5.06	8.12
OperatingExpenseAverageAsset	11200	3.60	1.22	0.84	2.83	3.52	4.32	7.37
ProvisionforLoanLossesAvera	11200	0.30	0.53	-0.64	0.00	0.14	0.40	3.00
NetInterestMargin	11200	3.73	1.06	1.52	3.02	3.63	4.37	6.87
OperatingExpenseGrossIncome	11200	74.20	17.08	25.55	63.85	75.64	85.54	116.05
NetOperatingExpenseAverageA	11200	2.86	0.91	0.80	2.30	2.82	3.35	5.72
LoansAssets	11200	86.34	7.29	60.84	82.93	87.70	91.46	97.50
SharestoEarningsAssets	10346	4.71	13.74	0.00	0.10	1.19	3.54	96.04
BorrowingstoSharesandNetWorth	11200	0.30	1.39	0.00	0.00	0.00	0.00	10.30
MemberstoPotential	11198	0.31	0.25	0.00	0.07	0.28	0.50	0.91
MemberstoEmployees	11111	484.49	207.14	206.77	356.71	431.75	544.36	1391.50
SalaryBenefitsFullTimeEqu	11199	57.15	15.08	25.00	47.00	55.00	65.00	108.00

Table 29 ANOVA test of differences in the ratio means between groups

		Group Means				
Ratio Definition	**Ratio Type**	**Target**	**Acquiring**	**Non-merging**	**F Ratio**	**Significance**
AssetGrowthRate (%)	Growth	2.54	7.61	4.22	341.93	0.0000
EquityGrowth	Growth	-2.02	6.87	2.71	985.29	0.0000
LoanGrowth	Growth	-1.92	7.40	2.66	916.57	0.0000
MemberGrowth	Growth	-2.26	4.45	-0.16	808.48	0.0000
ShareGrowth	Growth	3.29	7.70	4.50	225.96	0.0000
NetWorthRatio (%)	Capital Adequacy	11.79	10.72	12.12	425.72	0.0000
DelinquentLoansNWRatio	Capital Adequacy	7.07	7.25	6.18	70.98	0.0000
ClassifiedAssetsNWRatio	Capital Adequacy	5.92	6.92	5.14	280.26	0.0000
DelinquentLoansRatio	Asset Quality	0.83	0.82	0.78	12.88	0.0000
DelinquentAssetsRatio	Asset Quality	0.70	0.71	0.67	15.37	0.0000
NCOLoansRatio	Asset Quality	0.11	0.12	0.09	173.55	0.0000
ROAA	Earnings	-0.20	0.55	0.32	1062.34	0.0000
GrossIncomeAverageAssets	Earnings	4.94	5.67	4.94	820.41	0.0000
YieldonLoans	Earnings	6.26	5.65	6.11	719.17	0.0000
CostofFundsAverageAssets	Earnings	0.77	0.85	0.70	134.02	0.0000
NetMarginAverageAssets	Earnings	4.17	4.83	4.24	782.53	0.0000
OperatingExpenseAverageAsset	Earnings	3.91	3.83	3.60	185.48	0.0000
ProvisionforLoanLossesAvera	Earnings	0.38	0.46	0.30	192.24	0.0000
NetInterestMargin	Earnings	3.72	3.78	3.73	13.06	0.0000
OperatingExpenseGrossIncome	Earnings	82.02	68.27	74.20	1254.72	0.0000
NetOperatingExpenseAverageA	Earnings	3.18	2.87	2.86	321.54	0.0000
LoansAssets	Asset/Liability Mgmt	85.04	87.15	86.34	234.16	0.0000
SharestoEarningsAssets	Asset/Liability Mgmt	3.13	5.95	4.71	151.46	0.0000
BorrowingstoSharesandNetWorth	Asset/Liability Mgmt	0.36	2.10	0.30	1537.44	0.0000
MemberstoPotential	Productivity	0.28	0.18	0.31	776.64	0.0000
MemberstoEmployees	Productivity	475.97	397.39	484.49	778.57	0.0000
SalaryBenefitsFullTimeEqu	Productivity	56.95	63.29	57.15	577.41	0.0000

Table 30 Rotated component matrix for the whole sample

Ratio	Ratio Type	Factor1	Factor2	Factor3	Factor4
AssetGrowthRate (%)	Growth	0.0217	**0.6944**	-0.165	**0.6183**
EquityGrowth	Growth	-0.1114	**0.691**	-0.0096	-0.2845
LoanGrowth	Growth	-0.0765	0.3808	-0.1014	-0.0149
MemberGrowth	Growth	0.0399	0.4875	-0.0842	0.2133
ShareGrowth	Growth	0.0443	**0.6239**	-0.159	**0.6801**
NetWorthRatio (%)	Capital Adequacy	-0.2549	-0.0372	-0.0016	-0.0311
DelinquentLoansNWRatio	Capital Adequacy	**0.7071**	-0.1281	**0.5121**	0.1362
ClassifiedAssetsNWRatio	Capital Adequacy	**0.6132**	-0.0743	0.2115	-0.0328
DelinquentLoansRatio	Asset Quality	**0.712**	-0.1183	**0.5152**	0.1406
DelinquentAssetsRatio	Asset Quality	**0.7048**	-0.113	**0.5381**	0.1244
NCOLoansRatio	Asset Quality	**0.601**	-0.0931	0.1307	0.0122
ROAA	Earnings	-0.1705	**0.5897**	0.0722	**-0.5249**
GrossIncomeAverageAssets	Earnings	**0.838**	0.3487	-0.1723	-0.2387
YieldonLoans	Earnings	0.4807	-0.0146	-0.0684	0.0138
CostofFundsAverageAssets	Earnings	0.3212	0.2689	0.4305	0.1238
NetMarginAverageAssets	Earnings	**0.8014**	0.2777	-0.3678	-0.3115
OperatingExpenseAverageAsset	Earnings	**0.721**	-0.1237	**-0.6195**	-0.0162
ProvisionforLoanLossesAvera	Earnings	**0.5825**	-0.1275	0.2036	0.108
NetInterestMargin	Earnings	**0.7892**	0.138	-0.3182	-0.1689
OperatingExpenseGrossIncome	Earnings	-0.0714	**-0.5889**	**-0.57**	0.2715
NetOperatingExpenseAverageA	Earnings	**0.5807**	-0.2653	**-0.5814**	0.1187
LoansAssets	Asset/Liability Mgmt	-0.1836	0.0607	0.2229	-0.1822
SharestoEarningsAssets	Asset/Liability Mgmt	0.0044	0.0908	0.1084	0.0009
BorrowingstoSharesandNetWorth	Asset/Liability Mgmt	0.1177	0.1882	0.1464	-0.0086
MemberstoPotential	Productivity	-0.1653	-0.1104	0.1284	0.0896
MemberstoEmployees	Productivity	-0.2675	-0.1321	0.1251	0.1142
SalaryBenefitsFullTimeEqu	Productivity	-0.1238	0.0126	0.0947	0.0402

Table 31 Rotated component matrix

Panel A – Acquired credit unions

	Ratio Type	Factor1	Factor2	Factor3	Factor4
AssetGrowthRate (%)	Growth	-0.0712	0.4042	0.3804	**0.6469**
EquityGrowth	Growth	-0.2386	**0.6632**	0.098	-0.4516
LoanGrowth	Growth	-0.1018	0.1376	0.0646	-0.0852
MemberGrowth	Growth	0.0103	0.1633	0.0773	0.0861
ShareGrowth	Growth	-0.0367	0.3159	0.3649	**0.7242**
NetWorthRatio (%)	Capital Adequacy	-0.2842	0.0372	0.0087	0.0198
DelinquentLoansNWRatio	Capital Adequacy	**0.7245**	0.0312	**-0.5171**	0.0134
ClassifiedAssetsNWRatio	Capital Adequacy	**0.6448**	-0.0383	-0.2192	-0.0371
DelinquentLoansRatio	Asset Quality	**0.7305**	0.0798	**-0.5239**	0.0213
DelinquentAssetsRatio	Asset Quality	**0.7251**	0.0847	**-0.5425**	0.0124
NCOLoansRatio	Asset Quality	**0.573**	-0.0388	-0.1235	0.0968
ROAA	Earnings	-0.2431	**0.6815**	0.0741	-0.4962
GrossIncomeAverageAssets	Earnings	**0.8239**	0.3452	0.3358	-0.075
YieldonLoans	Earnings	0.4163	0.1615	0.1389	0.0691
CostofFundsAverageAssets	Earnings	0.3187	0.398	-0.1268	0.4292
NetMarginAverageAssets	Earnings	**0.7988**	0.2188	0.4319	-0.2562
OperatingExpenseAverageAsset	Earnings	**0.6999**	-0.3824	**0.5176**	-0.1237
ProvisionforLoanLossesAvera	Earnings	**0.5724**	-0.1214	-0.2181	0.2423
NetInterestMargin	Earnings	**0.79**	0.1783	0.3397	-0.1725
OperatingExpenseGrossIncome	Earnings	-0.094	**-0.8377**	0.2217	-0.0547
NetOperatingExpenseAverageA	Earnings	**0.5826**	**-0.515**	0.409	-0.0443
LoansAssets	Asset/Liability Mgmt	-0.1475	0.0588	-0.2158	-0.0981
SharestoEarningsAssets	Asset/Liability Mgmt	0.0182	0.0246	-0.0917	0.0909
BorrowingstoSharesandNetWorth	Asset/Liability Mgmt	0.144	0.1113	-0.0389	0.0926
MemberstoPotential	Productivity	-0.1798	-0.0484	-0.0658	0.0766
MemberstoEmployees	Productivity	-0.2599	-0.0483	-0.1191	0.0852
SalaryBenefitsFullTimeEqu	Productivity	-0.179	-0.151	-0.1299	0.0746

Panel B – Acquiring credit unions

	Ratio Type	Factor1	Factor2	Factor3	Factor4
AssetGrowthRate (%)	Growth	0.0217	**0.5488**	**0.6919**	0.1668
EquityGrowth	Growth	-0.0635	0.436	**0.535**	0.0233
LoanGrowth	Growth	-0.1313	0.4473	0.4061	0.1198
MemberGrowth	Growth	-0.0035	0.4575	**0.5757**	0.1842
ShareGrowth	Growth	0.0513	**0.5191**	**0.6664**	0.1699
NetWorthRatio (%)	Capital Adequacy	-0.2624	0.0975	-0.0714	-0.2223
DelinquentLoansNWRatio	Capital Adequacy	**0.7013**	-0.4645	0.1908	0.4249
ClassifiedAssetsNWRatio	Capital Adequacy	**0.6176**	-0.2947	0.0997	0.1064
DelinquentLoansRatio	Asset Quality	**0.7058**	-0.4386	0.1776	0.4148
DelinquentAssetsRatio	Asset Quality	**0.7035**	-0.4538	0.186	0.3971
NCOLoansRatio	Asset Quality	**0.6773**	-0.1789	0.0225	-0.1044
ROAA	Earnings	-0.1883	0.1506	0.2276	-0.2323
GrossIncomeAverageAssets	Earnings	**0.8273**	0.2727	0.0495	-0.4256
YieldonLoans	Earnings	**0.6278**	0.1451	-0.0159	-0.3376
CostofFundsAverageAssets	Earnings	0.3446	-0.3565	0.3995	-0.4418
NetMarginAverageAssets	Earnings	**0.7501**	0.4589	-0.1195	-0.2672
OperatingExpenseAverageAsset	Earnings	**0.6716**	**0.5644**	-0.3364	0.0333
ProvisionforLoanLossesAvera	Earnings	**0.6469**	-0.2287	0.0865	-0.1483
NetInterestMargin	Earnings	**0.7598**	0.3959	-0.1497	-0.0964
OperatingExpenseGrossIncome	Earnings	-0.0672	0.4542	**-0.5508**	**0.5807**
NetOperatingExpenseAverageA	Earnings	**0.5134**	0.481	-0.3373	0.2312
LoansAssets	Asset/Liability Mgmt	-0.1942	-0.168	0.1144	-0.1931
SharestoEarningsAssets	Asset/Liability Mgmt	-0.0394	-0.3485	0.4158	0.007
BorrowingstoSharesandNetWorth	Asset/Liability Mgmt	0.043	-0.2628	0.3418	-0.0636
MemberstoPotential	Productivity	-0.0528	-0.094	0.045	-0.09
MemberstoEmployees	Productivity	-0.1736	-0.0882	0.0763	-0.0809
SalaryBenefitsFullTimeEqu	Productivity	-0.1724	-0.1134	0.1288	0.1804

Panel C – Non-merging credit unions

	Ratio Type	Factor1	Factor2	Factor3	Factor4
AssetGrowthRate (%)	Growth	0.0427	0.0246	**0.6268**	**0.6412**
EquityGrowth	Growth	-0.1306	0.0718	**0.5904**	**-0.5339**
LoanGrowth	Growth	-0.0782	-0.0708	0.1332	-0.1548
MemberGrowth	Growth	0.0512	0.0132	0.2181	0.0223
ShareGrowth	Growth	0.0602	0.0249	**0.5614**	**0.7091**
NetWorthRatio (%)	Capital Adequacy	-0.1934	0.0812	0.0213	0.0159
DelinquentLoansNWRatio	Capital Adequacy	**0.6835**	**0.5127**	-0.247	-0.0725
ClassifiedAssetsNWRatio	Capital Adequacy	**0.5602**	0.1047	-0.1486	-0.0823
DelinquentLoansRatio	Asset Quality	**0.6952**	**0.5329**	-0.2202	-0.0597
DelinquentAssetsRatio	Asset Quality	**0.6814**	**0.5578**	-0.2319	-0.079
NCOLoansRatio	Asset Quality	**0.5781**	0.0937	-0.1741	0.1082
ROAA	Earnings	-0.1615	0.1052	**0.6142**	**-0.5862**
GrossIncomeAverageAssets	Earnings	**0.8698**	-0.0719	0.3535	-0.1087
YieldonLoans	Earnings	**0.5475**	0.0748	0.1494	0.0766
CostofFundsAverageAssets	Earnings	0.2694	**0.5924**	0.2685	0.2011
NetMarginAverageAssets	Earnings	**0.85**	-0.313	0.2815	-0.1985
OperatingExpenseAverageAsset	Earnings	**0.7873**	**-0.5543**	0.0027	-0.0289
ProvisionforLoanLossesAvera	Earnings	**0.5496**	0.1656	-0.2498	0.2068
NetInterestMargin	Earnings	**0.8242**	-0.238	0.2542	-0.0922
OperatingExpenseGrossIncome	Earnings	0.0206	**-0.7019**	-0.4577	0.1042
NetOperatingExpenseAverageA	Earnings	**0.6652**	**-0.5523**	-0.1105	0.0523
LoansAssets	Asset/Liability Mgmt	-0.2334	0.1921	-0.1249	-0.2027
SharestoEarningsAssets	Asset/Liability Mgmt	-0.0101	0.0046	-0.0067	-0.0347
BorrowingstoSharesandNetWorth	Asset/Liability Mgmt	0.1315	0.0743	0.046	-0.0276
MemberstoPotential	Productivity	-0.1499	0.257	-0.0543	0.0857
MemberstoEmployees	Productivity	-0.2797	0.1729	-0.1212	0.113
SalaryBenefitsFullTimeEqu	Productivity	-0.1198	0.0582	-0.1107	0.0045

Ratio formulas:

CAPITAL ADEQUACY

NET WORTH Ratio: Net Worth divided by total assets.

TOTAL DELINQUENT LOANS / NET WORTH: All loans 60 days or more delinquent divided by net worth.

CLASSIFIED ASSETS (ESTIMATED) / NET WORTH: Estimated Losses divided by Net Worth.

ASSET QUALITY

DELINQUENT LOANS / TOTAL LOANS: All loans 60 days or more delinquent divided by Total Loans.

DELINQUENT LOANS / ASSETS: All loans 60 days or more delinquent divided by total assets.

NET CHARGE-OFFS / AVERAGE LOANS: Total amount of loans charged-off during the year less all recoveries on charged-off loans during the year divided by average loans.

EARNINGS

RETURN ON AVERAGE ASSETS: Net Income (Loss) divided by average assets.

GROSS INCOME / AVERAGE ASSETS: Gross income divided by average assets.

YIELD ON AVERAGE LOANS: Interest on Loans (Gross – before interest refunds) divided by average loans.

COST OF FUNDS / AVERAGE ASSETS: Cost of funds divided by average assets. Cost of Funds includes dividends and borrowed funds expenses.

NET MARGIN / AVERAGE ASSETS: Gross income minus cost of funds divided by average assets.

OPERATING EXPENSES / AVERAGE ASSETS: Total operating expenses divided by average assets. Operating expenses do not include Provision for Loan and Lease Losses expenses.

PROVISION FOR LOAN & LEASE LOSSES / AVERAGE ASSETS: Provision for Loan & Lease Losses divided by average assets.

NET INTEREST MARGIN / AVERAGE ASSETS: Total of Interest on Loans (Gross – before interest refunds), Income from Investments, and Trading Profits and Losses, minus the cost of funds divided by average assets.

OPERATING EXPENSES / GROSS INCOME: Total operating expenses divided by gross income.

NET OPERATING EXPENSES / AVERAGE ASSETS: Total operating expenses minus Fee Income divided by average assets.

ASSET/LIABILITY MANAGEMENT

TOTAL LOANS / TOTAL ASSETS: Total Loans divided by Total Assets.

TOTAL SHARES, DEPOSITS AND BORROWINGS / EARNING ASSETS: Total Shares and Deposits, and total borrowings divided by the sum of Total Loans and Total Investments.

BORROWINGS / TOTAL SHARES AND NET WORTH: Borrowings divided by Total Shares and Net Worth.

PRODUCTIVITY

MEMBERS / POTENTIAL MEMBERS: Number of current members divided by the total of potential members.

MEMBERS / FULL-TIME EMPLOYEES: Number of current members divided by equivalent full-time employees.

SALARY & BENEFITS / FULL-TIME EMPLOYEES: Total Employee Compensation and Benefits divided by equivalent Full-time Employees.