The Influence of Loans Weights on the Profitability of Credit Unions

Author’s Details:
(1) Jalal El Fadil  
(2) Helyoth Hessou

Abstract:
Our main research objective is to study the influence of different decisions inherent to the weights given to some types of loans on the profitability of credit unions. The choice of weight given to mortgages and other types of loans can have a determining impact on a loan portfolio’s return and on the risk associated with it. This justifies our study, since a decrease in credit unions profitability would cause a drop in their capital and lead their managers to adjust it, sometimes not in an optimal way. Only few studies having been carried out on these financial institutions and on their loan and asset portfolio structural change. In order to reach our research objectives, we carried out statistical analyses and panel regressions by using biannual data from a large sample of credit unions in the United States. The results of our analysis enable us to conclude that the increase of the first mortgage loans weight is a profitable strategy, however granting risky loans would have a negative effect on credit unions profitability.

Index terms: Credit unions, Credit unions performance, Credit unions loan portfolio structure, Assets and liabilities management in banking industry, First mortgage loan.

I. INTRODUCTION

The 2007 financial crisis that took place in the United States and was largely associated with credit risk of mortgages has shown that the performance of this kind of loan can considerably influence the profitability of banks and credit unions as well as a country’s financial system (Sheehan, 2013; Youngha, Soosung, & Steve, 2012). Credit risk, one of the most important risks in the banking industry, can cause the insolvency of a financial institution or a drop in its profitability and its capital (Aggelopoulos, 2017). Such a decrease would lead these institutions to adjust their capital, sometimes not in an optimal way for their profitability (Lu, 2012). Thus, the choice of weight given to mortgages and other types of loans can have a determining impact on a loan portfolio’s return and on the risk associated with it. Generally, the allocation of assets (including loans granted) and liabilities (including deposits), can play a significant role in determining the performance of banks and credit unions (Curi, Lozano-Vivas, & Zelenyuk, 2015). Credit unions are different from other financial intermediaries regarding their ownership structure and their business model, and should not be treated like them. As a matter of fact, with respect to their ownership structure, credit unions, as non-profit institutions, are not business corporations and are governed by volunteers who are democratically elected by their members to whom the organization also belongs. In this way, a credit union (through its members) seeks to maximize mainly the profit attributed to its members who are both clients and providers of capital (Mckee & Kagan, 2016). This limits the advantage of taking excessive risks, which generally characterizes banks since they seek to maximize their shareholders’ value.

Recently, credit union institutions have intensively increased their holding of mortgage loans at the expense of new auto loans while keeping low the growth of their ratio of used auto loans. In fact, in average, the percentage of mortgage loans to the total loans increased from around 0.0873% in 1994 to 22.52% in 2015 and the percentage of new vehicle loans to the total loans decreased form 26% in 1994 to 15.20% in 2015. Given the potential effect of this change of portfolio allocation and its effect on credit union profitability, this paper investigates on the effect of the observed structural change and the choices inherent to the weights given to some types of loans on credit union performance and return.

II. LITERATURE REVIEW AND HYPOTHESES
The intermediation of credit unions is guided by the objective to provide benefit to their members (Goddard, 2008; Tokle and Tokle 2007; Smith, Cargil, and Meyer, 1981). Thus, with respect to their business model, these financial institutions try as much as possible to grant loans at lower rates and offer high rates for deposits. Each member represents a different aspect of the credit union’s balance sheet because the members with savings accounts will wish to increase their return on said accounts (Rubin et al., 2013). In addition, according to Memmel and Schertler (2012), the allocation of assets and liabilities, under the bank’s asset-liability management, depends on the financial institution’s objectives, which are generally, for credit unions, social or tied to regional development and affect the degree of risk that such institutions take (Altunbas et al., 2007).

Curi, Lozano-Vivas, and Zelenyuk (2015) put forth that different conclusions exist concerning the optimal combination of assets and liabilities in banks. Granting risky loans can increase the profitability of credit unions, but this comes with capital requirements that are greater than when granting less risky loans, like mortgages (Mckee & Kagan, 2016; Ely & Robinson, 2009; Kolari, Ou & Shin, 2006). In consequence, allocating weights for the different components of a loan portfolio must not only take into consideration the relationship between risk and return, but also the constraints relative to these requirements, which have become more important in the past few years.

In order to face the difficulties encountered when applying liquidity risk management principles, which were observed during the 2007 financial crisis, the Basel Committee on Banking Supervision published new measures with the objective of improving the banking sector’s capacity to absorb financial and economic shocks. These measures and propositions for bank regulation, would play an important part in the reinforcement of a country’s financial system as well as risk management, governance, transparency, and communication among banks (Sheehan, 2013).

However, the new requirements, particularly for increasing equity would push credit unions to increase their profits, ameliorate the management of their assets and investments, and pursue more funding to meet these requirements and increase their capital, which could lead to significant additional costs. Thus, in the current context in which credit unions operate and with the current difficulties, costs, and constraints they are faced with, it would be relevant to study their profitability in relation to the decisions inherent to the weights given to some types of loans and analyze which of these loans contribute to its increase, given that they do not have as many funding resources than commercial banks.

According to Furfine (2001) four factors can explain the weight change of each component in banks’ (and by extension credit union) asset portfolios. These factors are higher capital requirements, fewer demands for some type of loans, stronger regulatory verification, and a secular trend. In the banking industry, capital regulation is considered as one of the most important sources of change in banks assets allocation. For instance, Thakor (1996) and Passmore and Sharpe (1994) demonstrate that an increase in capital requirements based on risk can lead a bank to reduce the loans granted and increase its investment in government securities.

Whatever its origin, loan portfolio allocation in conjunction with asset management have an effect in the overall credit union profitability (Kuhil and Boru, 2018; Edmister and Srivastava, 1993). Recent trend in loan portfolio allocation by credit union make their analysis appealing. As an illustration, credit union changed the structure of their assets and loans portfolio by increasing, for example, their real state loans (Mckee and Kagan, 2016).

Empirically, various studies highlighted the relationship between loan portfolio composition and their total of assets performance. Miller and Noulas (1997), who studied the effect of different asset and liability choices on banks’ profitability, analyze different ratios including the ratios of mortgages and consumer loans on the total of loans. Their finding points to a negative effect of mortgage loans on credit unions profitability. Moreover, a
study carried out by Edmister and Srivastava (1993) demonstrates that banks consumer loans are positively associated with the losses reserve while weight associated to mortgage is uncorrelated to the reserve. This suggests that banks develop an ex-ante acknowledge of the potential losses that could arise from some loan types, such as personal loans. In addition to loan portfolio allocation, its diversification (both geographically and the type of collateral) can also affect loan portfolio performance (Youngha, Soosung and Steve, 2012; Calem and La Cour-Little, 2004). Indeed, this diversification can considerably reduce the risk of a loan portfolio and increase the overall profitability of the bank or the concerned credit union.

Despite their different corporative organization, their growth and potential impact on the market and the economy, few studies have been carried out on these institutions (Bauer, 2015; Ryder & Chambers, 2009). In our study, we try to fill part of the gap with a research on the influence of decisions inherent to the weights given to some types of loans, on their profitability in the case of United States. In order to reach our research objectives, we carried out statistical analyses and panel regressions by using biannual data from a large sample of credit unions in the United States.

More specifically, based on our literature review, the hypotheses that we mainly wished to validate in our study are the following:

Hypothesis 1: First mortgage loans negatively contribute to ROA.

This hypothesis is drawn from Miller and Noulas’ (1997) result concerning mortgages and the fact that increasing their ratio when compared with the total of assets negatively contributes to the ROA of the US banks that were part of their sample.

Hypothesis 2: Risky loans positively contribute to ROA.

This hypothesis is drawn from what Curi, Lozano-Vivas, and Zelenyuk (2015) stated about granting risky loans, and their capacity of increasing the profitability of credit unions. This knowing that capital requirements are greater than when granting less risky loans, like mortgages (Mckee & Kagan, 2016; Ely & Robinson, 2009; Kolari, Ou & Shin, 2006). This is coherent with the theory stipulating that high return is generally associated with higher risk-taking.

III. RESEARCH METHODOLOGY

In order to verify the relevance of our hypotheses, based on Miller and Noulas (1997), our research methodology consisted of statistical analyses and panel regressions with a fixed effect on time and kind of financial institutions considered, by considering ROA (net income/asset average) as the dependant variable. This enabled us to observe the effect on the latter of various independent variables we selected for our study, that is, the weights of loans, and to verify the significance of coefficients associated with these variables. ROA is acknowledged by many authors as a relevant performance measure for credit unions and other financial institutions (Isshaq, Aoah & Appiah-Gyamerah, 2019; Chazi Kallaf & Zantout, 2018; Akbar, Masyita, Febrian & Buchory, 2018; Goddard et al., 2008).

To give more reliability to our regressions and statistical analysis, and more significance to our main variables’ coefficients, we considered several control variables that can also influence the profitability of credit unions. Among these variables, there are those directly tied to these institutions and their characteristics. Other macroeconomic control variables were considered in our study, either linked to our sample’s financial institutions’ country of residence (the United States), or linked to the State where each credit union operated

A. Variable Descriptions
The main variables for loans considered in our study, and whose allocation can considerably influence the profitability of a credit unions (Curi et al., 2015; Miller and Noulas, 1997; Edmister and Srivastava, 1993), are the following:

- The First Mortgages/Total Loans ratio (FRMORT_LOAN)
- The Other Real State Loans/Total Loans ratio (OTHREALLO_LOAN)
- The New Vehicule Loans/Total Loans ratio (NEWVEH_LOAN)
- The Used Vehicule Loans/Total Loans ratio (USEDVEH_LOAN)
- The Unsecured Credit Cards Loans/Total Loans ratio (UNSECRCARD_LOAN)
- The Other Unsecured Loans/Total Loans ratio (OTHUNSEC_LOAN)

In order to give more reliability to our regressions and statistical analysis, and more significance to our main variables’ coefficients, we considered several control variables that can also influence the profitability of credit unions. Among these variables, there are those directly tied to these institutions and their characteristics:

- The investment/total assets ratio (INV_ASSET)
- The normal logarithm of the assets’ size (SIZE) and its square (SIZE2) because, according to Jokipii and Milne (2011) and Miller and Noulas (1997), size considerably influences the profitability of financial institutions. Indeed, an economy of scale can make these institutions more efficient in the region where they operate and play an important role in growing their profit.
- The growth of the normal logarithm for the size of assets (A_g) and this growth’s square (A_g2). As highlighted by Goddard et al., (2008) this increase would be positively tied to profitability for credit unions.
- The non-performing loan (NPL)/total assets ratio, given that this type of loan refers to loans for which clients have not paid their interests. This ratio is representative of risk that credit unions take and would considerably influence in a negative way their loans’ return and their profitability (Messai and Jouini, 2013).
- The ratio of revenues other than interests’ revenues (NIntInc_TInc) as well as the ratio of expenses other than interests’ expenses (NIntExp_TInc). These two ratios had to be included in our regressions because the profitability of the credit unions studied is also influenced by revenues and expenses other than interests (Elsas et al., 2010; Edmister Srivastava, 1993). On the one hand, an efficient management of expenses other than interests improves profitability and, on the other hand, the diversification of revenues other than interests, which has increasingly become more frequent among credit unions, as pointed out by Elsa et al. (2010), would generally boost this profitability.

Other macroeconomic control variables were considered in our study, either linked to our sample’s financial institutions’ country of residence (the United States), or linked to the State where each credit union operated. These variables are the following:

- Growth of the United States’ GDP (GDP_GROWTH). In the case where it is high enough, it can considerably influence the profitability of credit unions in a positive way, as is the case for several businesses in different fields. In this case, the level of unemployment would be low and that of household consumption would be high, which would increase the number and size of loans granted by these institutions as well as their revenues.
- Standard&Poor’s 500 (SP500) — the US stock market index. As for the variable (GDP_GROWTH), an increase in this index would be a sign of a healthy economy and would positively influence financial institutions’ ROA.
- The volatility of the US financial market (VIX), which represents investment risk in this market, would negatively influence the profitability of credit unions.
- The effective federal funds rate (EFFR). This represents a reference rate used by banks and credit unions to lend or borrow from other financial institutions. In general, the US Federal Bank determines a target rate according to its macroeconomic objectives and tries to reach this rate by using different monetary
strategies. Its objective with these strategies is to make the effective rate reach the target rate. When the latter increases so does the financial market’s interest rate, which can influence interest revenues and expenses for credit unions. This, in turn, can affect the ROA, either lowering or increasing it.

- The unemployment rate (UemplR) in each American State, which is crucial for taking into consideration the economic situation that prevail there. As mentioned by Smith and Woodbury (2010), these circumstances can affect the supply and demand for loans.

- The dummy variable (SINGLE_BOND), which takes on the value of 1 if the credit union’s purpose is based on a single characteristic to become a member. As a matter of fact, members of this kind of financial institutions are normally linked by a common trait that can be geography, employment, or affiliation to an organization, like a church. The advantage of a single common trait is that union members in this case know one another and have more information about one another’s credibility, which reduces the risk involved in granting loans (Ely, 2014; Goddard et al., 2008).

- Membership growth potential (POT_CURR_MEMB). It is related to individuals who can become but are not yet members of a credit union. This variable is considered to control the growth of granting loans by relying on these individuals and not on existing members (Goddard et al., 2008).

- A dummy variable (PCA) to control the influence of the formal introduction of a law (in 2000) on the minimum capital/assets ratio within the credit union system. This law was applied under the Prompt Corrective Action, which was a federal law in the United States. Since these financial institutions cannot increase their equity by using, like banks, other sources than profit, it would be reasonable to believe that they must adapt by reducing their assets to respect the minimum requirements. The (PCA) variable took on the value of 1 from 2000 to 2015.

Thus, the main model on which we based our statistical analysis to verify the relevance of our hypotheses was the following:

\[
ROA = CONST + \beta_1 \text{FRMORT}_{\text{LOAN}} + \beta_2 \text{OTHREALLO}_{\text{LOAN}} + \beta_3 \text{NEWVEH}_{\text{LOAN}} + \beta_4 \text{USEDVEH}_{\text{LOAN}} \\
+ \beta_5 \text{UNSECRCARD}_{\text{LOAN}} + \beta_6 \text{OTHUNSEC}_{\text{LOAN}} \\
+ \rho_1 \text{SIZE} + \rho_2 \text{SIZE2} + \rho_3 \text{Ag} \\
+ \rho_4 \text{Ag2} + \rho_5 \text{NPL} \\
+ \rho_6 \text{NIntInc}_{\text{Tnc}} + \rho_7 \text{NIntExp}_{\text{Tnc}} \\
+ \rho_8 \text{INV}_{\text{ASSET}} \\
+ \delta_1 \text{GDP}_{\text{GROWTH}} + \delta_2 \text{SP500} \\
+ \delta_3 \text{VIX} + \delta_4 \text{EFFR} \\
+ \delta_5 \text{UNEMPLR} + \delta_6 \text{SINGLE}_{\text{BOND}} \\
+ \delta_7 \text{POT}_{\text{CURRMEMB}} + \delta_8 \text{PCA}
\]

CONST represents the constant; \(\beta_1, \beta_2, \beta_3, \beta_4, \beta_5\) and \(\beta_6\) represent the coefficients of the variables inherent to loans; \(\rho_1, \rho_2, \rho_3, \rho_4, \rho_5, \rho_6, \rho_7\) and \(\rho_8\) represent the coefficients of endogenous variables linked to financial cooperatives’ characteristics; and \(\delta_1, \delta_2, \delta_3, \delta_4, \delta_5, \delta_6, \delta_7, \delta_8\) represent the coefficients of macroeconomic variables.

B. Data presentation

The data in our study came from biannual financial reports (call reports) of US credit unions, from 1994 to 2015. Our sample consisted in 12,574 of these institutions. Thus, we noted that the period of 22 years covered was long enough for our analysis not to suffer the influence of some aspects that can characterize a short period, such as political or economic aspects. In addition, our sample included a large number of institutions residing in different American States, which makes our statistical analysis more reliable.

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IV. RESULT ANALYSIS AND INTERPRETATION
We carried out a panel regression to verify how each type of loan contributes to credit unions’ profitability, shown by the ROA. We have to emphasise that the ROA is used with a lead lag effect to take into consideration that the influence of the changes in independent variables doesn’t have in general an instantaneous effect on the financial institutions return.

The first noteworthy observation regarding loans in our regression (see appendix). Thus, we found that the first mortgage loans/total loans ratio contributed very significantly and positively to ROA (0.0021061). This contradicts Miller and Noulas’ (1997) conclusion in their study of US banks as well as our first hypothesis. The ratio for other types of real estate loans (OTHERALLO_LOAN) also had a positive influence, but with a slightly lower coefficient related to the increase of its ratio to total loans (0.0019738), which is due probably to the fact that these loans are generally less guaranteed than the first mortgage. Furthermore, used vehicle loans contributed positively to the profitability of credit unions, since the coefficient related to the increase of its ratio to total loans (0.0015851) is positive with a high level of significance (1%). In addition, the ratios of unsecured credit cards loans and unsecured loans other than the latter are both negatives, which means that this kind of risky loans contribute negatively to credit unions returns. This is normal as these loans are unsecured and probably would suffer many acts of delinquency. This result contradicts our second hypothesis stating that risky loans contribute positively to credit unions profitability.

We also noted that asset growth had a positive influence on ROA, which was highlighted by Jokipii and Milne (2011). The squared coefficient of asset growth was negative, which meant that there existed an optimal growth that made it possible to make more profit. Note that the coefficient for non-performing loans (NPL) was negative with a high level of significance (1%), which was normal and encouraged credit unions to be more attentive when granting loans.

V. CONCLUSION
In the present article, we studied the effect of the choices inherent to the weights given to some types of loans on the profitability of credit unions in the United States the past few years. In fact, we analyzed the influence of the mentioned choices, represented by ratios, on the performance of the latter, represented by ROA. After, carrying out statistical analyses and panel regressions on a sample of 12,574 US credit unions and biannual data from 1994 to 2015, we made, as a theoretical contribution, many conclusions, including the ones relatives to our two hypotheses.

The structural change toward first mortgage loans is justifiable at strategic level since this type of loans can enhance the credit unions returns return on assets. which contradicted the conclusion reached by Miller and Noulas (1997), who studied a US bank sample, and did not validate our first hypothesis. On the other side, the risky loans such as credit cards loans and unsecured loans should not represent a big portion of the total loans. In fact, this type of loans doesn’t have a positive impact on the profitability of these financial institutions, which contradict our second hypothesis and imply that the later should not take too much risks to enhance their profit. Thus, our findings represent also a managerial contribution that can benefit the management of credit unions and the organizations that help them.

Nevertheless, like other relevant studies, our study was subjected to research limits. Namely the use of ROA, based on accounting elements from financial results because we did not use the market values of some variables, like investments, to calculate it. In addition, the ROA (a measure of financial performance) does not take into consideration other credit unions’ objectives, which are of social nature or linked to regional development (Altunbas et al., 2007; Goddard et al., 2008). However, according to Goddard et al. (2008) and Miller and Noulas (1997), it remains a reliable measure for performance.
Regarding research avenues, it would be appropriate to compare the difference in strategic choices inherent to loans between the most performing credit unions and less performing ones (Bauer, 2015). Another relevant research avenue would be to study the influence of allocating assets and liabilities on the credit unions performance and risk.

REFERENCES


Apendix

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<th>Variable</th>
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Control for the type of credit union: Yes
Control for the year: Yes
Control for the state: Yes
Constant: -0.0907*** 0.0336
Observations: 332,523
R-squared: 0.111
Number of credit unions: 12,574

Table 1: Regression 1