

The Market for Private Student Loans: An Analysis of Credit Union Involvement, Risk, and Returns.

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Abstract

Beginning in 2011, credit unions in the United States have been required to report in their quarterly call reports their holdings of private student loans. Since this time, private student loans have been the fastest growing loan product among credit unions. This study examines the characteristics of credit unions and their markets, which influence the decision to fund private student loans. We find this decision, to date, has not adversely affected risk, but has contributed to higher returns, and risk adjusted returns for the period 2011-2013. Credit unions interested in entering the market via participation loans, should do so with caution as the results indicate delinquency rates of private student loan portfolios are higher the more dependent they are on participation loans. This suggests a potential need for improved risk-management practices and monitoring as more credit unions enter the market through relationships with other institutions.

Keywords: Credit unions, private student loans, risk, delinquency

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1. Introduction

Federal credit unions were at one time only able to make fixed-rate short-term installment loans to members. A series of regulatory reforms and administrative changes between 1977 and 1982 though increased their lending opportunities, by allowing credit unions to offer 30-year residential mortgage loans, credit cards, and installment loans with maturities of up to twelve years (Pearce, 1984). Real estate loans today make up 53% of total loans held by credit unions in which 62% of first mortgage loans are at fixed rates 24% are a hybrid/balloon rate, and 15%

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are at adjustable rates (NCUA, 2013a). This high concentration in real estate loans creates exposure to credit risk, which as seen during the financial crisis of 2007-2009 can be quite substantial. During and subsequent to the crisis the concentration in first mortgage real estate loans has continued to rise, increasing from 32% of total loans at yearend 2006 to 41% at yearend 2013. With a larger portion of assets locked into fixed rates for the long term and liabilities mostly short term and variable, a negative gap creates exposure to interest rate risk, which negatively impacts net interest income if interest rates should rise. In the current low interest rate environment and with rising exposure to interest rate risk it is not surprising credit unions have turned their attention to alternatives to real estate loans.

Recently the fastest growing asset class among credit unions is in non-federally guaranteed student loans, hereafter referred to as private student loans (PSL). The aggregate value among credit unions of PSL has grown from 1.025 billion dollars at the end of March 2011 to 2.6 billion dollars by yearend 2013. While industry and individual credit union exposure to this market segment is currently small, the increased involvement by credit unions in PSL is noteworthy as a number of major commercial banks including JP Morgan Chase, Bank of America, and Citigroup have each decided to leave the PSL market entirely. Credit unions though are subject to greater interest rate risk than commercial banks and are more dependent on net-interest margins for income. Unlike mortgage loans, PSL are typically originated with variable interest rates, thus increasing their share among loans increases rate sensitive assets and reduces a credit union's negative gap. Further, if the characteristics of PSL borrowers differ from other loans in the portfolio, then credit unions may further benefit by diversifying across product lines by holding PSL.

The benefits to depository institutions from diversification of income sources is not clearly evident in the literature. Previous empirical studies have largely shown diversification by depository institutions into nontraditional banking activities (securities underwriting, insurance, and investments) that generate noninterest income does not reduce risk or increase returns. For U.S. commercial banks, DeYoung and Roland (2001) find replacing traditional lending activities with fee based services is associated with more volatile revenues. The effect of which is shown to lower both profitability (DeYoung and Rice, 2004) and risk adjusted returns on assets (Stiroh, 2004) among U.S. banks. Gambacorta, Scatigna, and Yang (2014) using a panel of 98 international banks, including 17 from the U.S., though find diversification into non-bank activities increases the return and risk adjusted return on assets up to a point. Returns and risk adjusted returns rise with the increase in the share of noninterest income to income up to 30% and then risk and return begin to decrease. This finding though may be unique to their sample selection, for Goddard, McKillop, and Wilson (2008) find increasing the same ratio reduces returns and risk adjusted returns over the relevant range of values for U.S. credit unions.¹

Diversification across traditional banking activities has been further shown to have a heterogenous effect on risk and return. Esho, Kofman, and Sharpe (2005) examine credit unions in Australia and find higher concentration across five asset classes increases risk and lowers returns.² Using separate measures for each class, they find the effect of diversification to vary across income sources. Increasing the share of interest income from residential mortgage loans, while reducing the interest income from consumer loans results in lower returns and risk,

¹ The average assets of the international banks in Gambacorta et al. (2014) sample is 439 billion, compared to 57 million dollars for the credit unions in Goddard et al. (2008).

² The five categories of income include: interest on residential mortgages, investment income, fee income on deposits and loans, fee income from off-balance-sheet activities, and other income. The omitted category includes interest income on personal loans. A similar breakdown for U.S. credit unions is not available in call report data.

whereas increasing fee income earned on deposits and loan activity increases risk and lowers returns. Stiroh (2004) also finds heterogeneity for U.S. commercial banks, with concentration in commercial and industrial loans leading to lower returns and higher risk, relative to residential mortgage loans. The take away from these studies is new lending activities or increasing certain lending activities will not necessarily result in higher returns or risk adjusted returns.

The main contribution of this study is to examine the effect credit union involvement with PSL has on risk and returns. We focus on credit unions due to data availability, where since 2011 PSL holdings have been publicly disclosed in quarterly call reports to the National Credit Union Administration (NCUA). A key to this relationship is understanding the potential for PSL involvement to be an endogenous regressor in our model specifications of risk and return. Endogeneity may be an issue if portfolio allocations across assets are influenced by risks or returns, such as in cases where management is motivated to diversify or chase higher returns by holding PSL. While the study does not attempt to discern the underlying causal motives for the use of PSL, it does establish several characteristics of credit unions and their style of asset and liability management associated with the decision. The purpose of which is to provide us with potential instruments to use in place of PSL involvement for our models of risk and return. Credit unions are member owned and are thus not publicly traded, therefore accounting data is used here to evaluate risk and returns. Two standard measures of risk are used in the analysis, which include the standard deviation in the return on assets and the probability of bankruptcy, z-score, as defined by Boyd, Graham, and Hewitt (1993). Returns are measured by the returns on assets and risk adjusted return on assets, where the risk adjustment accounts for the standard deviation in returns. The results indicate here credit union involvement with PSL has led to higher returns and risk adjusted returns in the period 2011-2013, without an effect on risk.

The format of the paper is organized as follows. Section 2 provides a discussion of private student loans. In section 3, we describe our data and empirical models of involvement and credit union performance, with a discussion of the results appearing in section 4. Section 5 examines delinquency rates across PSL portfolios, and section 6 concludes.

2. Private Student Loans

The market for PSL came to life in the mid-1990s, nourished by rapidly rising tuition prices and minimal real growth in family income, the origination of PSL grew by more than a factor of ten over the next decade.³ Private student loans provided an alternative for students whose financial need was increasingly more than the fixed amount they were able to borrow from federal loan programs. Entrance into the market was a natural extension for many depository institutions, as they were already actively engaged in the marketing, funding, and origination of federally guaranteed student loans.⁴ Securitization also played a key role in the mid-2000s, by providing liquidity and noninterest income to lenders through the creation of student loan asset backed securities (SLABS). With the collapse of the securitized asset market during the financial crisis, PSL originations were reduced by more than 50% in academic year 2008-09 relative to the year prior. Then in 2010 the Department of Education became the sole originator of federal student loans. No longer able to originate federal loans and quick profits having evaporated with the market for SLABS, a number of large banks decided to exit the student loan market entirely.

³ Private student loans originated in academic year 1995-96 were 1.7 billion dollars and in 2005-06 were 19 billion. (College Board, 2014). Between 1990 and 2010 the real price of college (tuition, fee, and room and board) at a 4-year public institution grew by 83%, whereas real median household income grew by 1.8% over the entire period. Calculations using Digest of Education Statistics 2013 and Federal Reserve data.

⁴ In academic year 2005-06 67 billion dollars of loans were made under the federal Stafford and Parent Plus loan programs (College Board, 2014). These were loans originated by depository institutions, yet guaranteed by the federal government.

While the origination of PSL has increased each of the last four years, it has done so at a much slower rate than pre-crisis, and remains less than half the size at its peak.

As several large banks unwind their positions in PSL, credit unions are entering into the market and rapidly expanding their holdings of PSL by in some cases originating their own loans, but more frequently through participation loans. Of concern to National Credit Union Administration regulators (NCUA, 2013b) is whether credit unions fully understand how the risks of PSL differ from federal student loans and other consumer loans. For example, most PSL are originated with a variable interest rate, whereas all federal student loans offer a fixed rate. In addition, interest rates on PSL are risk priced, which means they are tied to an index, most often 1-month LIBOR, and margin determined by the student's level of risk. To price risk requires a borrower to have a credit history, which for most students means having a co-signer on PSL. Federal Stafford loans do not require a cosigner and the amount a student is able to borrow is determined by the maximum of the student's financial need and the statutory limit of the program. Private student loans though also differ from most consumer loans as they offer much longer repayment periods of between 15 and 20 years. It would seem PSL with their long-term and variable interest rates, would be a natural addition to credit unions' portfolios in order to mitigate the interest rate risk associated with their high concentration in 30-year fixed-rate mortgages.

Private student loans though may also offer credit unions an opportunity to earn higher returns on their loans. Using loan level data from a sample of PSL lenders, the Department of Education and Consumer Finance Protection Bureau (CFPB) finds PSL borrowers in 2011 were

offered on average an initial variable rate of 7.8%, with a maximum rate of 19%.⁵ For comparison, data from NCUA (2011), shows the average 30-year fixed-rate mortgage rate offered by credit unions was 4.15% in 2011, with 5-year new car loans averaging 3.43%, and 3-year unsecured credit averaging a 10.22% fixed rate. While PSL are unsecured, they do offer a distinct advantage to lenders over credit cards and other unsecured loans, which is they are only dischargeable in rare cases of extreme hardship under current bankruptcy laws. This feature though does not eliminate credit risk from default and another unique feature may even obscure risk. Most PSL and all federal loans feature a deferral period, during which repayment of interest and principal is not required while a student is enrolled in school and for several months following separation. While in deferral, unpaid interest accrues to a PSL and is capitalized into the loan's amount. This creates the potential for a significant delay between an increase in credit risk among loans in deferral status and when the effects on default are seen. Lender level loan data examined by the CFPB (2012) shows there is a seasoning effect for PSL originated between 2005 and 2009. Default rates remain below 3% following the first two years of origination and separation, regardless of when the loan is originated. Default though rises significantly over time, with more than 10% of PSL originated in 2005 in default as of 2011, and default varying across vintages of loans over longer periods. Historically, PSL have had significantly higher default rates than other consumer loans.

3. Data and Empirical Model of PSL Involvement and Credit Union Performance

⁵ The CFPB (2012) report Private Student Loans was mandated pursuant to Section 1077 of The Dodd-Frank Wall Street Reform and Consumer Protection Act. The sample included nine large lenders and not credit unions.

In 2013, 638 of the 5757 credit unions in our sample (11%) held private student loans.⁶ The decision by credit unions to hold PSL is part of a larger strategy to manage their assets and liabilities in order to mitigate risk and or seek higher returns. Our model specification of PSL involvement controls for a number of factors characterizing credit unions, their asset and liability management, and their markets. Summary statistics of these factors appear in table 1. A number of financial ratios are used in the analysis.⁷ Financial data for credit unions is drawn from fourth quarter (December 31) Call Reports provided to the NCUA during the period 2011-2013. While our analyses use different cross sections of data, several of the variables we construct are over multiple periods. Therefore two adjustments are made to our financial data to allow for comparisons over time. In the first, nominal values are all converted into real December 2013 dollars by adjusting for the relative differences in the consumer price index. The second adjustment accounts for the fact that mergers between credit unions can significantly impact items on balance sheets and income statements. Similar to others (DeYoung and Roland, 2001; Esho et al., 2005), our merger adjusted financial data combines data from credit unions that subsequently merge within our period of analysis. For example, Eagle One's merger with Preferred Financial and Lancaster Postal Employees credit unions in 2013, results in a single observation of combined financial data for the three credit unions in the years prior to the mergers.

⁶ To mitigate the impact extremely small credit unions may have on our results, we use Ely's (2014) criteria to eliminate from our sample credit unions with either 100 or fewer members or those with assets of 2,000,000 or less in 2000 dollars. This restriction results in the elimination of 923 credit unions from the sample. Goddard et al. (2008, 1842) apply several criteria to eliminate credit unions with "extreme" or "nonsensical" financial data values. Many of these cases coincided with Ely's criteria, and the use of either or both did not qualitatively alter our results.

⁷ The formulas for all of the financial ratios used are based on NCUA Financial Performance Report ratios as updated periodically. <http://www.ncua.gov/DataApps/FPR/Pages/default.aspx>

Asset and liability management is important to mitigating gap exposure and interest rate risk, thus two standard financial ratios are included for this purpose. The ratio of net long-term assets to total assets measures a credit union's concentration in fixed rate assets, where a higher ratio indicates a more negative gap and increased exposure to interest rate risk.⁸ Reflecting the concentration in variable rate liabilities is the ratio of regular shares to total shares and borrowings, where a higher concentration of liabilities in regular shares (savings deposits) indicates a more negative gap as savings deposits are the most sensitive liability to interest rate changes. The summary statistics for 2013 reveal credit unions involved with PSL tend to have a higher share of long term assets (35% vs 23%), while their share of savings deposits is lower (37% vs 53%). In the case of their liabilities, it may be exposure to interest rate risk is less important to the decision to hold PSL than the ability of credit unions to tap into debt markets for the liquidity to fund PSL.

[Insert Table 1 about here]

Our model specification of involvement includes a measure of credit union liquidity, which is the ratio of cash and short term investments to total assets. Liquidity could indicate an ability to make more loans, such as PSL, but it also could indicate a management style that forsakes revenue opportunities by holding idle funds. Credit unions involved with PSL tend to hold less cash as a share of total assets to their counterparts (16% vs 24%). The loan to deposit ratio is another measure of asset and liability management included in the analysis. The higher this ratio, the more loans are supported by deposits and the higher are net interest margins, a key for credit unions dependent on traditional banking activities. Data for 2013 shows credit unions

⁸ Net long term assets includes the sum of first mortgage real estate loans, other real estate loans, member business loans, investments more than 3 years in maturity, land and building, other fixed assets, and share insurance deposits netting out real estate refinanced, unfunded business loans, and real estate loans also counted as business loans.

involved with PSL issue more loans relative to their deposits (69% vs 59%). Our model specification also includes a measure of capital adequacy. The data reveal credit unions involved with PSL have less of an ability to absorb losses than credit unions without PSL, which is potentially of concern to regulators if PSL are shown to carry more risk.

The characteristics of credit unions we control for include size and type of charter. The average size of credit unions with PSL is 536 million dollars in total assets relative to 143 million for their counterparts. Size may allow larger credit unions to take advantage of economies of scale and scope to enter the PSL market. Size also allows for the addition of new asset classes to the loan portfolio without having a large impact on the overall portfolio. Tripp and Smith (1993) showed credit union size was an important factor in credit unions entering the first-mortgage market in the years following the 1977 amendment to the Federal Credit Union Act. Size is measured using the logarithm of total assets. A variable for charter type, indicates if a credit union is a state chartered credit union. State regulators often cite fewer restrictions and a more collaborative regulatory environment as a reason to choose a state charter over federal charter, which may influence the decision to hold PSL.

Added to the specification is a measure of bank deposit concentration used by Ely (2014) to capture the competition among depository institutions found in a credit union's market. The measure uses FDIC summary of deposits data to construct a Herfindahl–Hirschman Index (HHI) of deposit concentration in the county or metropolitan statistical area, when applicable, where the credit union is headquartered. More competition, i.e. a lower ratio, is likely to motivate credit unions to seek out new lending opportunities as well as members, both of which are likely to influence involvement with new loan products such as PSL.

Among our control variables are three measures used later in our specifications of risk and return as instruments for identification purposes. These variables we posit play a unique role in being able to predict involvement with PSL, without directly influencing risk and return. Credit unions are formed as associations having common bonds and among federally-chartered credit unions this bond is further identified by a field of membership, which includes a category for “primarily educational” members. Credit unions with an inherent bond in education may have a better ability to monitor and assess risks associated with loans used for education purposes, and further may have members with greater interest to support such loans. Average annual enrollment growth of 4-year colleges is included to proxy for PSL demand in the credit union’s home market, with enrollment at the county level derived from National Center for Educational Statistics IPEDS data. The average is calculated over the previous three years. Enrollment growth is substantially stronger (41%) in the markets where credit unions hold PSL relative to those that do not (8%). The final measure is the percentage of members utilizing loans from the credit union. Tripp and Smith (1993) suggest this measure is a proxy for loan demand in general by members, but it may also represent a need to bring in new members, or new loan products, both achieved by entering the PSL market.

The model specifications for risk and return use the same control measures as the model for involvement, other than the instruments, which are used in place of PSL involvement when endogeneity is shown to be present. Two different measures of risk are examined, both common to the literature. The standard deviation in the return on assets measures a credit union’s variation in the annual return on their assets and has been used by Ely (2014), Esho et al. (2005), and Goddard et al. (2008) to study credit union performance. The second measure uses the z-score (Boyd et al. 1993) as an indicator for the probability of a credit union becoming insolvent

and is equal to $z = \left(\text{ROA} + \frac{\text{NW}}{\text{TA}} \right) / \sigma_{\text{ROA}}$, where ROA indicates the return on assets, NW/TA is the capital to assets ratio, and σ_{ROA} indicates the standard deviation in returns on assets. A larger z-score indicates it would take a larger deviation from mean returns for a credit union to become insolvent. Esho et al. (2005) and Ely (2014) use this measure in addition to the standard deviation in the return on assets to evaluate performance. The standard deviation of returns in the two measures is calculated using the return on assets over the period 2011-2013, with the return on assets and capital to asset ratios found in the z-score using the means over the period.⁹ Each of the measures represents risk over the three-year period, therefore in our specifications of risk each of the non-indicator control variables is the mean value over the three-year period for a given credit union. The indicator variables for PSL involvement, state charter status, and education field of membership are equal to one if they were equal to one during any of the three years.¹⁰

In addition, two common measures of returns are examined which include the return on assets (Ely 2014, Esho et al. 2005, Goddard et al. 2008) and risk adjusted return on assets (Goddard et al. 2008), which divides the return on assets by the standard deviation of returns. For the two measures of returns we examine both the effect on annual returns from 2013 and mean returns from 2011-2013. Similar to our analysis of risk measures, our specification of mean returns includes the means of our control variables and the modified indicator variables.

⁹ Similar to the other financial formulas, the return on assets is calculated using the NCUA formula. Due to the previous year's assets appearing in the formula, data from 2010 is used to calculate the value for 2011.

¹⁰ There were very few transitions between charter types and education field of membership in our sample. Three credit unions move from a federal to a state charter and twenty moved from a state to federal charter. Nine credit unions changed their membership type to education and two became a different type other than education during the period examined. In regards to PSL involvement, 168 credit unions entered the PSL market, 23 left and 493 were involved throughout.

The summary statistics reveal credit unions that hold PSL on average have a lower standard deviation for the returns on assets and lower probability of becoming insolvent (larger z-score). In addition credit unions that hold PSL had a return on assets of .57% in 2013 vs .32% for credit unions that did not. Risk adjusted returns were higher as well for credit unions holding PSL.

[Insert Table 1 about here]

4. Estimation Results

4.1 Involvement with private student loans.

A logistic regression model is used to estimate the characteristics of credit unions involved with private student loans in 2013. The model specification controls for financial ratios that reflect a credit union's capital adequacy and asset/liability management style, in addition to its characteristics (charter and size), along with differences in market conditions. Each of the variables is measured using its 2013 value. The estimated coefficients in Table 2 indicate a number of factors significantly influence whether credit unions are involved with PSL. The marginal effects reported are estimated at the overall mean values and are based on a one standard deviation change for the continuous measures, whereas our dichotomous measures (state charter and education field of membership) capture a one-unit change.

The results indicate increasing the size of a credit union by one standard deviation, increases the likelihood of being involved with PSL by 5.8 percentage points. This may seem small in magnitude, but one should note the probability of being involved with PSL for a credit union with average characteristics is only 6.6 percentage points. Thus increasing size nearly doubles the likelihood of a credit union being in the market for PSL. Size provides credit unions an opportunity to take advantage of economies of scale and expand into new loan products.

Exposure to interest rate and credit risk as measured by the share of net long term assets is found to increase the probability of being involved with PSL by 2.2 percentage points. The effect of the share of savings deposits to liabilities though is found to be negative and statistically insignificant. Among the other financial ratios, the loan to deposit ratio indicates credit unions with less liquidity are more likely to fund PSL. Taken together, these latter two results seem to suggest credit unions may rely more on borrowing than deposits to fund their PSL holdings. In addition, the results indicate credit unions with lower capital adequacy as measured by net worth to total assets are 1.8 percentage points more likely to be involved with PSL, which may be a concern to regulators and the industry if PSL are associated with higher risk. The proxy measure for loan demand by members, which is the percentage of members who borrow indicates an increase in loan demand increases PSL involvement by 1.5 percentage points.

With respect to credit union characteristics, credit unions with a state charter are shown to be less likely to hold PSL. This may suggest state regulators look less favorably upon PSL than their federal counterparts. Federal credit unions with an education field of membership are nearly twice as likely as other federal credit unions to be involved in PSL. Credit unions with an educational membership may be responding to higher demand for PSL from their members, or they may believe they have an information advantage allowing a better ability to evaluate PSL. Market conditions in the credit union's home market played a role as well in PSL involvement, with a decrease in banking competition, represented by an increase in bank deposit concentration, reducing the likelihood of being involved by .7 percentage points. A competitive market among depository institutions forces credit unions to find new borrowers and lending opportunities, such as seen here with students and PSL.

The second set of estimates in Table 2 evaluate the robustness of our findings to the treatment of mergers, and merger adjusted data. Of our sample of 5757 credit unions, 5161 were never involved in a merger during the period 2011-2013. Results from using this sub-sample of credit unions are quite similar to those from our original findings, with the marginal effects evaluated at the means for the sub-sample of observations.

[Insert Table 2 about Here]

4.2 The risk of private student loan involvement

In the analysis that follows, we examine whether credit union involvement with private student loans has been associated with higher risk, where risk is measured using both the standard deviation in the return on assets and z-score, which is negatively related to the probability of bankruptcy. Each of the risk measures is calculated over the period 2011-2013, with each credit union having a single value for each measure. Our main variable of interest is the indicator variable as to whether the credit union was involved with private student loans. One of the concerns, noted previously, is credit unions may choose to diversify their assets if returns are unstable. In such a case, it is possible risk may influence asset selection, or some other unobserved characteristic may influence both involvement with private student loans and risk outcomes, in which case endogeneity may be present and our estimates biased. To resolve this issue, instrumental variables are used in order to test for and eliminate if necessary the impacts of endogeneity.

Appropriate instruments need to be both relevant and exogenous, therefore they need to explain credit union involvement with private student loans and not directly influence risk. In the instrumental variables models below, we identify two or more instruments for each

specification, which allows the use of an overidentification test to determine whether the instruments are exogenous. To determine their relevance, an F-statistic is used to evaluate the instruments' explanatory power in the first stage, with values greater than 10 indicating they are strong (Staiger and Stock, 1997). The candidates for instruments are drawn from our model specification of involvement with private student loans. While each of these variables is seemingly relevant, one needs the instruments to not be influenced by risk or influence risk directly, i.e. they are exogenous. Financial ratios are therefore unlikely exogenous given they are frequently used by regulators to assess risk, thus our analysis uses education field of membership, the percentage of members who are borrowers, and mean enrollment growth as instruments. Statistical tests will help to assess whether the instruments are appropriate. Endogeneity though is not necessarily present as indicated by the Hausman test, in which case inference should be drawn from the regression estimates of ordinary least squares (OLS) rather than IV.

Table 3, columns one and two, include the results from using IV and OLS to estimate the standard deviation of the return on assets. Education field of membership and number of loans per member are used as instruments in the specification of this IV model. To estimate the z-score found in columns 3 and 4, mean enrollment growth is added to the list of instruments in order to ensure that our instruments are exogenous.¹¹ Both sets of instruments are found to be strong with F-statistics of 22 and 16 and as equally important are exogenous with p-values of .15 and .20 for the Sargan test of overidentification. The Hausman test further reveals endogeneity is not present using either measure of risk, therefore the following discussion is based on the

¹¹ The null hypothesis of the Sargan test is the overidentification restrictions are valid, thus failing to reject the null indicates our instruments are exogenous. The estimates do not qualitatively change when enrollment growth is excluded. The issue is the p-value of the Sargan overidentification test is .07, which indicates evidence against our instruments being exogenous at the 10% level.

OLS estimates in columns two and four. Based on either measure of risk, involvement by credit unions in private student loans does not appear to have had an impact on risk over the period 2011-2013. Neither coefficient is statistically significant at any reasonable level.

For the standard deviation in the return on assets, increasing a credit union's size is shown to reduce risk, with the effect statistically significant at the 1% level. Our estimated coefficient of $-.058$ is larger in terms of impact, than the estimates of size found by Ely (2014) for the earlier periods (2004-2007 and 2008-2011) he used in his analysis of credit union field of membership and risk. Size may therefore be increasing in importance for diversification in the post-crisis period. A lack of liquidity is shown to play a role in risk as a higher loan to deposit ratio contributes to a higher standard deviation in the returns on assets. It is thus odd that we find more liquidity, indicated by the ratio of cash and short-term investments to total assets, contributes to more risk. It is possible having idle funds is more of an overall indication of poor management, which leads to more volatile returns. The results indicate state chartered credit unions have lower volatility in their returns. It is possible state chartered credit unions develop closer relationships with local regulators that assist them with managing risk. Another possibility is state chartered credit unions may have access to a more expansive set of powers than their federal counterparts, which improves diversification. Neither of our measures of exposure to interest rate risk had a significant effect on variation in the return on assets, perhaps due to the low interest rate environment during the period. In addition, capital adequacy was not found to have an effect. This differs from Goddard et al (2008), where credit unions with higher amounts of net-worth relative to total assets faced higher risks for the period 1993-2004. The OLS estimates for deposit concentration, indicate competition did not influence the standard deviation in the return on assets, a result similarly found by Ely (2014) for earlier periods.

A higher z-score is an indication of lower risk. Similar to the effect on the standard deviation on returns, we find increasing size and having a state charter reduce the probability of bankruptcy. Unlike for the previous measure of risk, both of our measures of interest rate risk exposure indicated a more negative gap was associated with lower risk. This result is likely due to the paths followed by interest rates on savings deposits and 30-year fixed rate residential mortgages for the period examined. Saving deposits rates remained low throughout the period, declining from .28 % to .21% over 2011 and were .16% and .13% at yearend 2012 and 2013, while mortgage rates declined from 5.05% to 4.15% over 2011, declining further in 2012 to 3.56%, and then rising to 4.52% by yearend 2013.¹² The more negative a credit union's gap, the more net interest margins rise as interest rates fall, which reduces the probability of bankruptcy. With respect to the effect of liquidity, we find an increase in the ratio of cash to total assets, reduces the risk of failure as indicated by the z-score, yet it increased the standard deviation of returns.

[Insert Table 3 about here]

4.3 Returns to private student loan involvement

A credit union is rewarded from holding private student loans if they are able to earn higher returns. Here we examine both whether the return on assets and risk adjusted return on assets were significantly higher among credit unions involved with PSL. The potential for endogeneity is also relevant to analyzing returns. It is possible asset allocation decisions are based on the path of past returns, such that successful credit unions seek out new loan products to build off of past returns. In this case involvement with PSL may act as an endogenous regressor in our

¹² NCUA Credit Unions and Bank rates, various years. <http://www.ncua.gov/DataApps/Pages/CUBNKMain.aspx>

models of returns. Similar to our analysis of risk, the education field of membership and percentage of members who are borrowers are used as instruments to test for and mitigate when necessary the potential impact of endogeneity. Returns, unlike the risk measures used above, can be calculated for a single period or averaged over several periods. The model specification for the mean return on assets (ROA) is found in column one of Table 4 and uses the same controls from the analysis of risk, which include the means of the financial measures, our merger adjusted indicator variables, and the mean level of market concentration. Column two reports results using the annual return on assets for 2013. The control variables are the same as in the specification of mean returns, but the values are from 2013.

Examining the test statistics from the IV estimates of the mean return on assets and return on assets for 2013, our instruments are shown to be both strong and exogenous in each case. Unlike the estimates of risk, the Hausman test indicates PSL involvement is an endogenous regressor in the specification of return on assets and thus estimates from IV are only reported. Credit unions involved with PSL are shown to have annual mean returns 1.85 percentage points higher than their counterparts, with the result significant at the 1 % level. The magnitude of which is quite substantial, given the mean rate of return on assets is .44 % over the period 2011-2013 among all credit unions. Involvement with PSL had a similar effect on the return on assets in 2013, with an estimated coefficient of 1.88, also significant at the 1% level. From these results it appears there is evidence to suggest credit unions with private student loans are associated with earning higher returns.

For the most part, the magnitude and statistical significance of the other coefficients were similar across the two models, thus discussion focuses on results using the mean. Increasing the share of long term assets by 10 percentage points, reduced mean returns by .07 percentage

points. The estimate is similar in magnitude to the effect found by Ely (2014) in the pre-crisis period 2004-2007. Ely (2014) though found for 2008-2011 the relation to be positive with a 10% increase in the share of long term assets increasing credit union returns by .02 percentage points. It appears with the economic recovery, long term assets (real estate loans, business loans and investments of more than three years) have underperformed relative to other assets, which include PSL.

Not surprisingly, credit unions with a higher loan to deposit ratio earned a higher return on assets, as they also tend to have a higher net interest rate margin. More assets in idle cash and short-term investments also reduced returns. We find more adequately capitalized credit unions earned higher returns, a result also found by Goddard et al. (2008). State chartered credit unions were able to earn a .08 percentage point higher return on their assets relative to their federal counterparts. Similar to Ely's (2014) pre-crisis (2004-2007) estimates, we find less market competition leads to higher returns among credit unions as increasing the HHI measure by 1000 leads to a .05 percentage point increase in returns.

[Insert Table 4 about here]

Of further interest is the effect on the risk adjusted returns on assets (RAR). The dependent variable in Column 3 uses the mean risk adjusted return on assets, which is the mean return divided by the standard deviation of returns, with both values calculated over the period 2011-2013 and mean values used as controls. Column 4 instead uses the annual return on assets from 2013, divided by the previously used standard deviation in returns, along with controls with annual values. Both sets of IV estimates indicate endogeneity is present and our instruments remain strong and exogenous. The factors found to increase returns were found to increase risk adjusted returns, whereas the two factors shown to reduce returns had no effect on risk adjusted

returns. Size, which did not impact the mean return on assets, did contribute to higher risk adjusted returns.

4.4 Robustness of Findings – Mergers and Concentration of Private Student Loans

The estimates above seem to suggest credit unions involved with PSL earn higher returns, even when one accounts for risk. To evaluate whether mergers influenced the results, we provide estimates in Table 5 for the model specifications of returns on assets and risk adjusted returns on assets using the sub-sample of credit unions not involved with a merger.¹³ The results of which confirm the finding of higher returns on assets and risk adjusted returns on assets among credit unions involved with PSL. Excluding observations with mergers, the impact of PSL on the return on assets is slightly larger. The coefficient for PSL involvement on mean returns is 2.17 relative to 1.85 with merger adjusted data and the coefficient for year 2013 returns is 1.88 relative to 1.80. The effect on mean risk adjusted returns is unchanged, whereas it is lower for 2013 returns. The coefficient for the effect of PSL involvement diminishes from 11.1 to 9.22, when credit unions with mergers are omitted from the sample.

[Insert Table 5 about here]

The results provide clear evidence credit unions with PSL are associated with higher returns in the period 2011-2013. If involvement in PSL were to have a causal impact on returns, then one might expect credit unions with a higher concentration in this type of loan to also offer higher returns. In the model specifications found in Table 6, the dichotomous measure of PSL involvement used in the specifications of returns (Tables 4 and 5) is replaced with the percentage

¹³ The results from using the risk measures were not impacted by omitting credit unions with mergers. Results are available upon request.

of loans consisting of PSL.¹⁴ Private student loan concentration is low among credit unions that hold PSL, averaging just 1.8% in 2013. Our model specifications again use the education field of membership indicator and percentage of members who are borrowers to instrument for PSL concentration. The IV estimates indicate the instruments are strong, with F-statistics even larger than those found from the analysis of PSL involvement. The results find the mean and annual returns to assets are both larger, the more highly concentrated a credit union's loans are in private student loans. Increasing concentration by one percentage point increases mean return on assets by .36 percentage points, whereas 2013 returns increase by .21 percentage points, with both results statistically significant at the one percent level. These findings are further supported from the results using risk adjusted returns.

[Table 6 about here]

5. Performance of Private Student Loan Portfolios

Private student loans have provided credit unions a source of income that has contributed to higher returns on their assets, without any evident impact on overall risk. Portfolios of PSL have performed differently than other loans. At yearend 2013, the average delinquency rate of PSL portfolios held by credit unions was .73%, which is lower than the overall loan portfolio delinquency rate of 1.02% for credit unions with PSL, and the 1.46% rate for all credit unions in our sample. Credit unions though may be underestimating their risk exposure as they compare the current performance of PSL portfolios to other assets, due to their PSL being in deferral. A unique feature of student loans is the payment of interest and principal can be deferred while a

¹⁴ For brevity's sake we do not report the effect of concentration on risk or on the effect of returns using the non-merger observations. The conclusions drawn throughout are not impacted in either instance and these results are available upon request.

student remains enrolled in school, with unpaid interest capitalized into the loan balance. Credit unions may thereby temporarily increase their net income by issuing PSL and collecting their origination fees, with the effects of delinquent payments deferred into the future. Starting in 2013, credit unions have been required to report their PSL in deferral status. More than one third of all PSL held by credit unions were in deferral at the end of 2013, thus it appears credit unions are gaining experience with PSL in repayment.¹⁵ In the analysis that follows, we examine the variation in PSL portfolio performance across credit unions to determine how factors, such as loans in deferral, are impacting risk. Net income by type of loan is not available, thus one is unable to evaluate the return to the PSL portfolio directly. Risk is instead measured here by the delinquency rates in PSL portfolios at yearend 2013.

Given credit unions lack experience with PSL, it is not surprising many have entered the PSL market through participation loans. The ratio of PSL participations purchased to loans in the PSL portfolio was 23% in 2013. Buying participation into PSL allows credit unions to add PSL to their balance sheet without having to originate the loans to their own members, which may be beneficial if there isn't sufficient demand among members or if the credit union wishes to diversify credit risk across regions. Participation loans though tend to have higher delinquency rates than loans in general. The concern from regulators (NCUA, 2008) with this is credit unions may not be providing due diligence in assessing the risk of third-party relationships, or adequate monitoring of risk over time. To control for this our model specification includes the share of participation loans in the PSL portfolio.

¹⁵ What is unclear from the data and potentially a much larger concern is the vintage of the PSL held and whether credit unions understand the effects of seasoning beyond the deferral period. Without cohort level data this cannot be addressed.

A feature unique to credit unions, relative to most other depository institutions, is they are member owned. As such credit unions provide financial resources to educating members, primarily through financial literacy programs designed to ensure members make responsible choices with their money. It would seem credit unions more committed to educating their members, would be less likely to overextend loans to borrowers, and provide more sound financial counseling to keep borrowers out of financial harm. This may be particularly relevant to students, who are young and lack experience with credit. Of curiosity here is whether a credit union's portfolio of PSL performs better, in terms of having a lower delinquency rate, the more committed they are to engaging their members and community in educational programs. Unfortunately, call report data combines noninterest expenditures on educational activities with promotional activities. Promotional activities, in the form of aggressive marketing of high risk loans, played a role in the housing crisis. It is possible, such marketing could offset any benefits of lower defaults from educational programs. If aggressive marketing tactics were being used, one would assume the ratio of promotional and educational expenditures to total loans would also be lower, as expenditures on marketing go towards supporting more loans. Unable to separate the two effects, a negative coefficient on the ratio of noninterest expenditures on promotion and education to total loans suggests either an increase in education and or less aggressive marketing, reduces delinquency.

The model specification controls for three other characteristics of PSL portfolios. Interest rates on private student loans are determined by the borrower's level of risk, thus portfolios of PSL with higher interest rates are likely subject to more risk and place a larger financial burden on repayment, which one would expect to increase delinquencies. In 2013 the average interest rate of loans in PSL portfolios was 6.29%, and ranged between 1.75% and

15.62%. Rising student loan balances have created concerns whether students are able to repay their loans. Average loan size is included in the model specification to evaluate the impact on loan performance. The final characteristic of the PSL portfolio reflects the emphasis the credit union places on PSL in the overall loan portfolio. Regulators require credit unions to have more advanced risk management policies the more they concentrate in an industry. Further, one would expect credit unions that put more of their lending focus on PSL to have a better understanding of the risks. For the average credit union, concentration in PSL is low, which highlights the limited experience credit unions have with PSL. Summary statistics for the 631 PSL portfolios with complete data appear in Table 7.

[Insert Table 7 about here]

The baseline specification also controls for four of the characteristics of credit unions including their size, average enrollment growth in their market, whether they have an educational field of membership, and state charter. Size may play a role in determining the experience and resources a credit union has to manage risk, whereas credit unions with an educational membership may have an informational advantage in issuing education loans, which reduces delinquency. The dependent variable, delinquency rate, is a fraction and varies between 0 and .21 in the sample. A generalized linear model (Papke and Woldridge, 1996) with a logit link and binomial distribution is used here to estimate the fractional model. This specification constrains the predicted values to between 0 and 1, with coefficients of the estimates interpreted similar to the logistic model. In a subsequent specification, we add the financial ratios used earlier to the baseline model and in another we add several market characteristics to examine robustness of the baseline results.

Estimates appear in Table 7, where the marginal effects indicate the impact on the delinquency rate from a one standard deviation change in the continuous variables and a one unit change in the indicators. The results show, not surprisingly, the share of PSL in deferral has an influence on the delinquency rate of the portfolio. Increasing the share in deferral reduces the delinquency rate by .17 percentage points in 2013, with the result statistically significant at the 1% level. The magnitude of the effect may seem small, but given the average delinquency rate is .73 percentage points, the effect is in fact quite substantial. The share of participation loans in the PSL portfolio is shown to increase delinquency, with the estimate also statistically significant at the 1% level. A one standard deviation increase in the share of the PSL portfolio in participation loans increases delinquency by .22 percentage points. This result may be an indication credit unions with participation loans may rely too heavily on third-parties for evaluating risk. It may though indicate there are differences in lending criteria used for loans that are originated and held, and those bought under participation agreements.¹⁶

[Insert Table 8 about here]

Our proxy measure for community engagement indicates the higher the ratio of education and promotion expense to total loans, the lower is the delinquency rate. As the share increases, the delinquency rate decreases by .13 percentage points. By devoting more resources to education and marketing for a given loan volume, it appears credit unions are more selective in their lending. Portfolios with higher interest rates were more likely to be delinquent as expected. Surprisingly, concentration in PSL increased the delinquency rate, with the effect statistically

¹⁶ Consider three credit unions, where credit union A and B both originate PSL, but credit union A uses a lower credit standard than B. Credit union C does not originate PSL, instead they buy participation loans from A with the same standard of credit used by A. If credit union A sells off their weakest loans, based on observed characteristics to C, then one would expect credit union C's portfolio of participation loans to perform worse than the portfolios of A and B with none.

significant at the 10% level. The marginal effect though had the smallest impact, as a one standard deviation increase in concentration reduced the delinquency rate by only .06 percentage points. Enrollment growth was the other statistically significant coefficient, with markets exhibiting faster growth having higher defaults. We did not find any evidence to suggest credit unions with an education field of membership had PSL portfolios that performed any differently than other credit unions.

To evaluate the robustness of these results, a number of other factors were added to the baseline model specification. Column two adds the financial measures capturing asset and liability management used previously in the analysis. The regression results indicate none of the added financial controls are statistically significant and the marginal effects are largely unaltered from the baseline model.¹⁷ In column 3 the model specification considers whether economic characteristics of the credit union's market impact PSL portfolio performance. Private student loan performance is heavily dependent on the macroeconomy and job market in particular (NCUA, 2013). Controls added are specific to the MSA where the credit union is headquartered when in a MSA, otherwise they are based on the county. Included is the concentration of bank deposits used earlier in our analysis. In addition, we controlled for the unemployment rate, per capita income growth, and population growth in the market. The estimates reveal none of the market characteristics has any effect on PSL portfolio performance. It is quite likely many PSL are made to students who go to school or live subsequent to their studies in other markets, such that the market conditions where the credit union is headquartered has no impact on PSL borrower repayment.

¹⁷ To conserve space we did not report the coefficients of the added variables, but they are available upon request.

Conclusion

The results presented here indicate the decision by credit unions to become involved with PSL has been motivated by a desire to reduce their concentration in real estate loans. By diversifying and holding PSL, credit unions are potentially able to decrease their loan portfolio's exposure to interest rate risk and credit risk. The results though here indicate holding PSL does not affect risk, as measured by either the variation in the return on assets or probability of bankruptcy. This may be due to the fact PSL are currently only a small part of credit unions' loan portfolios. In our sample, 11% of credit unions hold PSL and among these credit unions the average loan concentration in PSL is only 1.8%. Therefore we may not be able to discern an effect from the data due to limited variation in PSL concentration. It is also possible relatively stable interest rates during the period examined (2011-2013) may have limited the effect of holding PSL on risk. If rates were to rise over several years, we may see a different outcome as PSL reduce the effects of interest rate movements on net income. The other possibility is adding PSL to the portfolio may simply not reduce risk, even when a different or longer period is examined.

While risk has not been impacted by PSL involvement, average returns on assets were shown to be 2.17 percentage points higher for credit unions involved with PSL. In addition, an increase in the concentration of loans among PSL by one percentage point led to an increase in average returns by .32 percentage points. These differences in returns remain statistically significant even when adjusting for risk. It appears, credit unions may be holding more PSL in place of real estate and other long terms loans in order to earn higher returns. Of concern, is whether credit unions fully understand how PSL portfolios perform differently than other consumer loans. Analysis of the variation in PSL portfolio delinquency rates, indicates the share of the PSL portfolio in deferral reduces delinquency, which is not a surprise. The share of the

PSL portfolio in deferral will change over time with the volume of origination, thus credit unions entering the PSL market need to monitor the seasoning of the loans in their portfolio or they risk underestimating future risks and overstating returns, based on current performance. The results also indicate credit unions that enter the PSL market via participation loans should ensure adequate policies are put in place to purchase and subsequently monitor loans in their PSL portfolios, given the share of participation loans in the portfolio is shown to significantly increase the delinquency rate.

For the period 2011-2013, PSL have contributed to higher returns for credit unions without an adverse effect on risk. Based on this one would predict the share of PSL among the loan portfolios of credit unions will continue to rise in the future. What remains to be seen is how these portfolios of PSL will perform if interest rates rise, and students face higher loan repayments. Lenders need to be particularly wary given the current calls by policymakers and regulators to reduce payments for overextended borrowers of PSL. If interest rates were to rise, such pressure is likely to rise disproportionately along with credit risk.

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Table 1: Credit Union Summary Statistics

	2013				2011-2013			
	Involved with PSL		No Involvement		Involved with PSL		No Involvement	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Net Long Term Assets/ Total Assets (%)	34.50	13.85	23.27	16.13	31.97	12.66	21.44	14.78
Sav. Dep./ Total dep. & Borrowing (%)	37.20	17.24	53.18	24.23	35.71	17.09	51.73	24.56
Loans / Deposits (%)	68.54	18.48	58.99	20.74	67.07	17.43	59.04	19.74
Cash and S.T. Investments/ Total Assets (%)	15.62	9.19	23.56	12.93	17.42	8.56	25.06	11.97
Net worth / Total Assets (%)	10.67	3.09	12.58	5.18	10.55	3.10	12.57	5.18
State Charter	0.38	0.49	0.40	0.49	0.41	0.49	0.41	0.49
Size	18.93	1.54	17.28	1.51	18.88	1.53	17.26	1.49
Bank Deposit Concentration	1755.06	898.57	1902.28	1094.62	1771.81	891.18	1890.76	1059.45
Education Field of Membership	0.08	0.28	0.05	0.21	0.10	0.30	0.05	0.22
Members who Borrow (%)	53.17	20.71	44.17	20.02	51.86	20.19	43.73	22.24
Enrollment Growth (%)	0.41	9.25	0.08	1.04	0.40	9.08	0.08	1.04
Std. Dev. Return on Assets	---	---	---	---	0.27	0.30	0.36	0.54
Z-score	---	---	---	---	90.72	161.88	88.10	152.21
Return on Assets (%)	0.57	0.57	0.32	0.88	0.62	0.52	0.41	0.69
Risk Adjusted Return on Assets	5.00	12.51	2.91	7.40	5.18	12.23	3.22	7.36
Observations	638		5119		662		5095	

Table 2: Logistic Regression of Private Student Loan Involvement in 2013

	Merger Sample	Marginal Effects	No Merger Sample	Marginal Effects
Net Long Term Assets/ Total Assets (%)	0.0189*** (0.0039)	2.16	0.0185*** (0.0043)	2.12
Sav. Dep./ Total dep. & Borrowing (%)	-0.0035 (0.0031)	-0.50	-0.0038 (0.0033)	-0.55
Loans / Deposits (%)	0.0089*** (0.0031)	1.22	0.0078** (0.0033)	1.07
Cash and S.T. Investments/ Total Assets (%)	-0.0067 (0.0066)	-0.51	-0.0115 (0.0074)	-0.86
Net worth / Total Assets (%)	-0.0681*** (0.0152)	-1.82	-0.0732*** (0.0166)	-1.99
State Charter	-0.3581*** (0.0982)	-2.13	-0.3358*** (0.1102)	-1.71
Size	0.4327*** (0.0362)	5.75	0.4266*** (0.0408)	5.31
Bank Deposit Concentration	-0.0001** (0.0000)	-0.70	-0.0001* (0.0001)	-0.63
Education Field of Membership	0.7748*** (0.1795)	6.48	0.8957*** (0.1921)	6.79
Members who Borrow (%)	0.0106*** (0.0021)	1.45	0.0105*** (0.0023)	1.44
Enrollment Growth (%)	0.0143 (0.0121)	0.29	0.0221 (0.0255)	0.47
Constant	-10.1973*** (0.8093)		-9.9266*** (0.8988)	
Observations	5757		5161	
Pseudo R-squared	0.180		0.180	

*, **, *** Statistically different from zero at the 10%, 5%, and 1% level.
Standard errors in parentheses.

Table 3: PSL Involvement and Credit Union Risk, 2011-2013

	Std. Dev. ROA		Z-Score	
	IV ^ Estimation	OLS Estimation	IV # Estimation	OLS Estimation
PSL Involvement	-0.35969 (0.26235)	-0.01620 (0.02249)	-37.54093 (72.90239)	0.51044 (6.70435)
Net Long Term Assets/ Total Assets (%)	0.00089 (0.00071)	0.00053 (0.00065)	0.40302** (0.20509)	0.36572* (0.19196)
Sav. Dep./ Total dep. & Borrowing (%)	-0.00004 (0.00039)	-0.00010 (0.00038)	0.46815*** (0.11062)	0.46468*** (0.11020)
Loans / Deposits (%)	0.00337*** (0.00054)	0.00300*** (0.00045)	0.21280 (0.15003)	0.17551 (0.13183)
Cash and S.T. Investments/ Total Assets (%)	0.00148* (0.00087)	0.00163* (0.00085)	0.91149*** (0.25417)	0.93518*** (0.24962)
Net worth / Total Assets (%)	-0.00106 (0.00158)	-0.00039 (0.00147)	-	-
State Charter	0.04387*** (0.01688)	-0.03218** (0.01407)	13.25671*** (4.91451)	14.59542*** (4.19037)
Size	-0.03901** (0.01596)	0.05826*** (0.00623)	9.43789** (4.53216)	7.26927*** (1.84676)
Bank Deposit Concentration	-0.00001* (0.00001)	-0.00001 (0.00001)	0.00204 (0.00203)	0.00233 (0.00195)
Constant	0.86530*** (0.26748)	1.17397*** (0.12562)	-148.47430* (76.54025)	113.41472*** (37.13880)
Observations	5757	5757	5757	5757
First Stage F - Statistic	22.1		16.4	
Sargan statistic (p-value)	0.15		0.2	
Hausman Endogeneity Test (p-value)	0.18		0.6	
Adjusted R-squared		0.035		0.008

*, **, *** Statistically different from zero at the 10%, 5%, and 1% level

^ Instruments include education field of membership and percentage of members who borrow

Instruments include education field of membership, percentage of members who borrow, and enrollment growth

Table 4: PSL Involvement and Credit Union Returns - IV Estimates [^]

	Return on Assets		Risk Adjusted Return	
	2011-2013 Mean ROA	2013 ROA	2011-2013 Mean RAR	2013 RAR
PSL Involvement	1.85388*** (0.41765)	1.80134*** (0.48533)	8.90948** (4.14752)	11.11190** (4.32313)
Net Long Term Assets/ Total Assets (%)	-0.00649*** (0.00114)	-0.00501*** (0.00124)	-0.01412 (0.01129)	-0.01520 (0.01106)
Sav. Dep./ Total dep. & Borrowing (%)	-0.00076 (0.00062)	-0.00122* (0.00071)	0.00418 (0.00613)	0.00083 (0.00636)
Loans / Deposits (%)	0.00548*** (0.00085)	0.00541*** (0.00103)	0.03940*** (0.00847)	0.03881*** (0.00918)
Cash and S.T. Investments/ Total Assets (%)	-0.00618*** (0.00139)	-0.00506*** (0.00145)	-0.01307 (0.01382)	-0.00087 (0.01293)
Net worth / Total Assets (%)	0.01036*** (0.00252)	0.01873*** (0.00287)	0.07745*** (0.02499)	0.09823*** (0.02557)
State Charter	0.07925*** (0.02687)	0.08418*** (0.03186)	0.72153*** (0.26684)	0.85801*** (0.28377)
Size	0.02688 (0.02541)	0.04854* (0.02879)	0.57910** (0.25236)	0.48145* (0.25645)
Bank Deposit Concentration	0.00005*** (0.00001)	0.00005*** (0.00001)	0.00028** (0.00011)	0.00032*** (0.00011)
Constant	-0.48804 (0.42582)	-1.08799** (0.49685)	-11.39601*** (4.22861)	-10.63724** (4.42576)
Observations	5757	5760	5760	5760
First Stage F - Statistic	22.1	22.3	22.1	22.3
Sargan statistic (p-value)	0.12	0.38	0.1	0.21
Hausman Endogeneity Test (p-value)	< .01	< .01	0.02	< .01

*, **, *** Statistically different from zero at the 10%, 5%, and 1% level

[^] Instruments include education field of membership and percentage of members who borrow

Table 5: PSL Involvement and Credit Union Returns - IV Estimates [^] and No Mergers

	Return on Assets		Risk Adjusted Return	
	2011-2013 Mean ROA	2013 ROA	2011-2013 Mean RAR	2013 RAR
PSL Involvement	2.17320*** (0.51100)	1.88413*** (0.53121)	8.96702* (4.70870)	9.22128** (4.48674)
Net Long Term Assets/ Total Assets (%)	-0.00684*** (0.00128)	-0.00479*** (0.00131)	-0.01356 (0.01178)	-0.01158 (0.01109)
Sav. Dep./ Total dep. & Borrowing (%)	-0.00065 (0.00068)	-0.00108 (0.00075)	0.00517 (0.00627)	0.00270 (0.00633)
Loans / Deposits (%)	0.00561*** (0.00094)	0.00578*** (0.00106)	0.04404*** (0.00862)	0.04585*** (0.00892)
Cash and S.T. Investments/ Total Assets (%)	-0.00565*** (0.00156)	-0.00451*** (0.00153)	-0.01002 (0.01440)	0.00280 (0.01295)
Net worth / Total Assets (%)	0.00992*** (0.00279)	0.01745*** (0.00301)	0.06556** (0.02568)	0.08208*** (0.02546)
State Charter	0.07152** (0.02991)	0.07247** (0.03311)	0.68377** (0.27558)	0.69180** (0.27963)
Size	0.01983 (0.02900)	0.05271* (0.02963)	0.57635** (0.26724)	0.59384** (0.25024)
Bank Deposit Concentration	0.00005*** (0.00001)	0.00005*** (0.00001)	0.00023** (0.00011)	0.00025** (0.00012)
Constant	-0.40408 (0.47929)	-1.18717** (0.50574)	-11.43373*** (4.41646)	-12.59978*** (4.27161)
Observations	5161	5161	5161	5161
First Stage F - Statistic	18.7	21.6	18.7	21.6
Sargan statistic (p-value)	0.18	0.23	0.35	0.35
Hausman Endogeneity Test (p-value)	< .01	< .01	0.04	0.03

*, **, *** Statistically different from zero at the 10%, 5%, and 1% level

[^] Instruments include education field of membership and percentage of members who borrow

Table 6: PSL Concentration and Credit Union Returns - IV Estimates [^]

	Return on Assets		Risk Adjusted Return	
	2011-2013 Mean ROA	2013 ROA	2011-2013 Mean RAR	2013 RAR
PSL Concentration	0.36532*** (0.07240)	0.20630*** (0.04937)	2.04752*** (0.77567)	1.40091*** (0.47217)
Net Long Term Assets/ Total Assets (%)	-0.00475*** (0.00097)	-0.00330*** (0.00100)	-0.00594 (0.01043)	-0.00486 (0.00955)
Sav. Dep./ Total dep. & Borrowing (%)	-0.00053 (0.00057)	-0.00103 (0.00064)	0.00521 (0.00609)	0.00190 (0.00608)
Loans / Deposits (%)	0.00721*** (0.00068)	0.00731*** (0.00073)	0.04755*** (0.00724)	0.05020*** (0.00696)
Cash and S.T. Investments/ Total Assets (%)	-0.00599*** (0.00130)	-0.00439*** (0.00130)	-0.01137 (0.01388)	0.00349 (0.01248)
Net worth / Total Assets (%)	0.00949*** (0.00228)	0.01801*** (0.00252)	0.07551*** (0.02439)	0.09561*** (0.02410)
State Charter	0.03620* (0.02154)	0.03201 (0.02385)	0.53022** (0.23081)	0.54608** (0.22813)
Size	0.11843*** (0.00951)	0.13865*** (0.01028)	1.00925*** (0.10185)	1.03217*** (0.09833)
Bank Deposit Concentration	0.00005*** (0.00001)	0.00005*** (0.00001)	0.00028*** (0.00011)	0.00029*** (0.00011)
Constant	-2.07468*** (0.18740)	-2.65865*** (0.20374)	-18.95992*** (2.00767)	-20.28055*** (1.94842)
Observations	5756	5756	5756	5756
First Stage F - Statistic	35.5	57.6	35.5	57.6
Sargan statistic (p-value)	0.61	0.43	0.57	0.93
Hausman Endogeneity Test (p-value)	< .01	< .01	< .01	< .01

*, **, *** Statistically different from zero at the 10%, 5%, and 1% level

[^] Instruments include education field of membership and percentage of members who borrow

Table 7: PSL Portfolio Summary Statistics, 2013.

	Mean	Std. Dev.
Delinquency Rate	0.0073	0.0180
Deferral Share (%)	37.2394	35.9437
Participation Share (%)	23.1965	40.2710
P & E Expenditures / Total Loans (%)	0.2051	0.1266
Average Loan Size (\$1000)	10.6269	12.1059
Interest Rate	6.2995	1.5171
PSL Concentration (%)	2.4833	4.3640
State Charter	0.3788	0.4855
Education Field of Membership	0.0840	0.2776
Size	18.9269	1.5330
Enrollment Growth (%)	0.4175	9.3031

Table 8: GLM Estimates (Logit Link, Binomial Distribution) of PSL Portfolio Delinquency, 2013

	(1)		(2)		(3)	
	Estimates	Marginal Effects	Estimates	Marginal Effects	Estimates	Marginal Effects
Deferral Share (%)	-0.01003*** (0.00251)	-0.17	-0.00971*** (0.00237)	-0.17	-0.01034*** (0.00258)	-0.18
Participation Share (%)	0.00794*** (0.00264)	0.22	0.00870*** (0.00251)	0.24	0.00752*** (0.00255)	0.20
P & E Expenditures / Total Loans (%)	-1.98607** (0.81393)	-0.13	-1.81086*** (0.67604)	-0.12	-1.99873** (0.82410)	-0.13
Average Loan Size (\$1000)	-0.01252 (0.01153)	-0.08	-0.01241 (0.01169)	-0.08	-0.01320 (0.01140)	-0.08
Interest Rate	0.16851*** (0.04291)	0.17	0.16192*** (0.04621)	0.16	0.16415*** (0.04486)	0.16
PSL Concentration (%)	0.02287* (0.01220)	0.06	0.02084 (0.01395)	0.05	0.02253* (0.01248)	0.06
State Charter	0.18267 (0.17864)	0.11	0.13614 (0.16969)	0.04	0.18062 (0.17608)	0.05
Education Field of Membership	0.13887 (0.25412)	0.08	0.22093 (0.24073)	0.04	0.11103 (0.26316)	0.02
Size	0.12024 (0.08770)	0.12	0.15324** (0.07517)	0.15	0.10625 (0.08504)	0.10
Enrollment Growth (%)	0.00214* (0.00109)	0.01	0.00190* (0.00104)	0.01	0.00254** (0.00111)	0.01
Constant	-7.89726*** (1.93501)		-8.89880*** (1.68476)		-7.04168*** (1.76243)	
Financial Controls	NO		YES		NO	
Market Controls	NO		NO		YES	
Observations	631		631		623	

*, **, *** Statistically different from zero at the 10%, 5%, and 1% level. Standard errors are robust to heteroskedasticity.
Financial controls include: net long term assets/total assets, saving deposits/total deposits and borrowing, loan to deposits ratio, cash & short term investments/total assets, net worth/total assets.

Market controls include: Bank deposit concentration, unemployment rate, per capita personal income growth, and population growth. Estimates of the financial and market controls are available upon request.