

CREDIT UNION

INVESTMENT

PRICE RISK

Jim Vilker
Patrick Sickels
and
Chip Filson

Expect NCUA and state examiners to stress credit union investment portfolios to determine credit union price risk sensitivity to rising interest rates.

Review your investment portfolio prior to your next Safety and Soundness or ALM examination, and prepare a risk assessment prior to examiner arrival.



LEGAL DISCLAIMER

*The information contained in this whitepaper does not constitute legal advice. We make no claims, promises or guarantees about the accuracy, completeness, or adequacy of the information contained in this whitepaper. You should retain and rely on your own legal counsel, and nothing herein should be considered a substitute for the advice of competent legal counsel. These materials are intended, but not promised or guaranteed to be current, complete, or up-to-date and should in no way be taken as an indication of future results. All information is provided "as is", with no guarantee of completeness, accuracy, timeliness or of the results obtained from the use of this information, and without warranty of any kind, express or implied, including, but not limited to warranties of performance, merchantability and fitness for a particular purpose. In no event will CU*Answers, its related partnerships or corporations, or the partners, agents or employees thereof be liable to you or anyone else for any decision made or action taken in reliance on the information provided or for any consequential, special or similar damages, even if advised of the possibility of such damages.*

PRICE RISK BASICS

Price Risk Defined

The basic definition of **price risk** is the risk an investment will eventually be worth less than what the investor paid initially. There are always winners and losers in investments. Successful price risk management is the practice of being on the winning side of the devaluation more times than not. Credit unions are expected to manage price risk in a fluctuating interest rate environment.

Price risk is occasionally referred to as **valuation risk**. The concepts are the same.

“... it is incumbent upon NCUA, as steward of the National Credit Union Share Insurance Fund (“the Fund”), to consider a credit union’s IRR management policy and implementation program as a factor in determining whether the Fund should insure its member deposits.”

The NCUA submission to Congress discussing revised Rules and Regulations Part 741

A Simple Price Risk Example

Suppose a credit union buys a \$1,000 par value bond with a 10-year maturity and a 6% coupon rate. In this example, the credit union would earn 6% of \$1,000 per year (\$60 per year), for every year the bond is owned.

Let’s say after a year the credit union wants to sell the bond. Unfortunately, now the \$1,000 par value bonds have a 7% coupon rate. The credit union will be unable to sell the bond for \$1,000 because the credit union’s bond earns less than the new bonds being issued. Instead, the credit union will have to discount the bond’s price to the new owner. This loss on the investment is the *price risk*.

Of course, the reverse is possible as well. If after a year the \$1,000 bond rates drop to 5%, the credit union’s 6% bond is much more attractive to a buyer. An investor will be willing to pay more than \$1,000 to earn 6% per year rather than 5%.

Duration analysis is used to help investors gauge these price fluctuations that are due to interest rate risk. The investment’s duration will determine how its price is affected by interest rate changes. The higher the bond’s duration, the greater its sensitivity to the interest rate changes. This sensitivity is the investment’s **volatility**.

Committee Responsibilities

Because of interest rate sensitivity, the NCUA considers price risk management to be an Interest Rate Risk (IRR) subject, coming under the review of the ALM and/or Risk Committees. Price risk is only one component of investment IRR and must be evaluated along with the other components, which include Basis Risk, Option Risk, Spread Risk, Yield Curve Risk, and Repricing risk.

If a credit union has investments and is currently not reviewing all these risks, risk management responsibility and reporting should be assigned immediately to the appropriate Committee with reports completed on no less than a quarterly basis. According to NCUA Rules and Regulations 741 (“NCUA 741”), risk assessment responsibility should be assigned to someone other than those responsible for making investment decisions.

“Credit unions that do not have a written IRR policy or that do not have an effective IRR program are out of compliance with § 741.3 of NCUA’s regulations”

The NCUA submission to Congress discussing revised Rules and Regulations Part 741

Duration Examples

The **maturity** of a fixed-income investment is simply how long the instrument lasts. For example, a 10-year Treasury bond has a 10-year maturity. **Duration** is a measure of the length of time it will take the bond's cash flows to repay the investor *the price originally paid for the bond*. The smaller the duration of a bond, the faster an investor will get back the investment through coupon payments and the final par-value payment. The weight for each period is not based on the nominal value of the cash flow received at that time, but rather the present value of the cash flow.

A CD that has a 5-year maturity has a 5-year duration because the only cash flow involved (i.e. the payment received when the CD matures) will be received in five years.

In contrast, a 5-year bond will have a duration that's less than its 5-year maturity. If sold for face value, a 5-year bond with a 1% coupon rate will have a duration of 4.89 years. The reason the duration is less than 5 years is that some of the cash flows (the 1% coupon rate) will be received prior to the bond's 5-year maturity. By contrast, a 5-year bond with a higher yield will have an even shorter duration. For example, if sold for face value, a 5-year bond with a 5% coupon rate would have a duration of 4.49 years. Despite having the same maturity as the lower-yielding bond, the 5% bond has a shorter duration.

The math behind duration analysis in interest rate risk management is not complicated. The formula is:

$$\text{Change in Price} = -DUR \times \frac{\Delta i}{1+i}$$

Where DUR = duration, Δi = change in interest rates, and i = current interest rate.

If a credit union is holding a 5-year bond with a duration of 4.89 years, and another with a duration a 4.49 years, and interest rates rise by 1% from 5% to 6% than the risk for each bond is calculated:

For the 1% bond: -4.89 duration times the change in interest rate ($0.06 - 0.05 = 0.01$) divided by 1 plus the current interest rate ($1 + 0.05 = 1.05$) = -0.0466 or **-4.66%** price risk.

For the 5% bond: -4.49 duration times the change in interest rate ($0.06 - 0.05 = 0.01$) divided by 1 plus the current interest rate ($1 + 0.05 = 1.05$) = -0.0428 or **-4.28%** price risk.

The 1% bond has greater price risk.

The greater the duration of a security, the greater the percentage change in the market value of the security for a given change in interest rates. *Therefore, the greater the duration of a security, the greater the interest-rate risk.* By providing a way to estimate the effect of certain market changes on a bond's price, duration the investor can choose investments that will better meet future cash needs. Duration also helps income investors who want to take on minimal interest rate risk understand why they should consider bonds with high coupon payments and shorter maturities.

NCUA PRICE RISK CONCERNS

Now a Major Focus of Safety and Soundness Exams

The NCUA has begun examining credit unions based on the 2012 regulatory changes made to NCUA 741. NCUA 741 was subsequently reintroduced in a May letter to credit unions outlining the new NCUA 741 examination guidelines. As stated in the body of the proposal of the regulation:

“Although some IRR is a normal part of financial intermediation, it still may negatively affect a credit union’s earnings, net worth, and its net economic value ... IRR takes several forms: Repricing risk, yield curve risk, spread risk, basis risk, and options risk.”

The NCUA submission to Congress discussing revised Rules and Regulations Part 741

This statement almost certainly means the NCUA will look at the price risk of credit union investments, and the impact of that risk to the credit union’s net worth. If the NCUA stresses the credit union’s investment portfolio and determines that the potential losses would undercapitalize the credit union, management should expect the NCUA to demand divesture and other changes to credit union risk management practices under the threat of a DOR.

The (Reduced) Role of the Corporate Credit Unions and the Impact on the NCUA

In addition to safety and soundness concerns, the NCUA is also reacting to the significant drop in the market share of investments held by the Corporate Credit Unions. The market share of credit union investment holdings by Corporates has fallen from over 33% prior to 2007 to only 6-7% today. This reduction in Corporate Credit Union investment market share has two major consequences the NCUA is trying to address through regulation and examinations:

Investments are now in the market. Most credit union investments today live directly in the market. Credit unions are increasingly invested in CDs, Agency Securities, CMOs and, in some states, corporate and municipal bonds. These direct securities (except CDs) are held as either available for sale or trading. Corporate investments did not require sale or trading classifications for investment securities. Investments that live directly in the market are much more susceptible to interest rate price fluctuations, and there are more credit union investments living in the market now than there has been at any time in credit union history.

Investments have reduced liquidity. Corporate Credit Union securities were very short and liquid, and could be easily borrowed against. By contrast, market securities can place significant pressure on credit union liquidity and require more careful management.

The revisions the NCUA made to 741 show the NCUA’s concern about this new investment environment and the potential for catastrophe to the Share Insurance Fund (“Fund”) if interest rates rise.

The rules in NCUA 741 apply to all credit unions over \$50 million in total assets, and any credit unions between \$10 million and \$50 million in assets whose Supervisory Interest Rate Risk Threshold (“SIRRT”) ratio exceeds 100%. The NCUA 741 summary goes on to say that although the amount of real estate loan holdings has decreased since 2008, the amount of investments with maturities greater than 5 years has increased. Longer maturity investments are, by their nature, more susceptible to interest rate fluctuations.

Withdrawal of Federal Insurance for Credit Unions Non-Compliant with 741

The NCUA's concern about credit union investment holdings and the sensitivity of these investments to price risk caused the NCUA to add a significant threat. The NCUA tied compliance with NCUA 741 to credit union insurability. NCUA 741 directly states that credit unions who are not effectively managing IRR, including price risk, could see their share insurance **revoked**.

“ ... the consistent rise in IRR at credit unions relative to other peer institutions deserves regulatory attention and is warranted as a prerequisite for insurability.”

The NCUA submission to Congress discussing revised Rules and Regulations Part 741

Therefore, whether or not credit union management agrees with the testing methodology of the NCUA or its conclusions, it is vital to take NCUA concerns seriously. Preparing a price risk response plan prior to examiner arrival could be a very valuable to assist management through the examination.

Although not directly stated in the Federal Register, a likely assumption is that the NCUA fears large credit unions \$500 million or more in assets have so much price risk in the investment portfolios that the ongoing viability of the Fund is threatened. To protect the Fund, the amendments to NCUA 741 include a specific section for large credit unions as well as an attached six-page Examiner Expanded Scope Checklist. Credit union CFOs of larger credit unions should carefully review NCUA 741 modifications while paying particular attention to the Examiner checklist and commentary found in the cells of the spreadsheet.

SIRRT Ratio

The SIRRT ratio is calculated by adding the Total First Mortgages Held to the Total Investments with Maturities Greater than Five Years, and dividing that total by the Total Net Worth of the Credit Union. The NCUA looks very closely at any credit union where this ratio exceeds 100%. Note, however, *any* credit union over \$50 million in assets is subject to the requirements of NCUA 741, whether the credit union's SIRRT ratio exceeds 100% or not.

12 CFR 741 Risk Terminology

The NCUA defined risk components that need to be evaluated by credit unions on page twelve of the [Federal Register](#) discussing the changes to 12 CFR 741:

Basis risk: The risk to earnings and/or value due to a financial institution's holdings of multiple instruments, based on different indices that are imperfectly correlated.

Interest rate risk: The risk that changes in market rates will adversely affect a credit union's net economic value and/or earnings. Interest rate risk generally arises from a mismatch between the timing of cash flows from fixed rate instruments, and interest rate resets of variable rate instruments, on either side of the balance sheet. Thus, as interest rates change, earnings or net economic value may decline.

Option risk: The risk to earnings and/or value due to the effect on financial instruments of options associated with these instruments. Options are embedded when they are contractual within, or directly associated with, the instrument. An example of a contractual embedded option is a call option on an agency bond. An example of a behavioral embedded option is the right of a residential mortgage holder to vary prepayments on the mortgage through time, either by making additional premium payments, or by paying off the mortgage prior to maturity.

Repricing risk: The repricing of assets or liabilities following market changes can occur in different amounts and/or at different times. This risk can cause returns to vary.

Spread risk: The risk to earnings and/or value resulting from variations through time of the spread between assets or liabilities to an underlying index such as the Treasury curve.

Yield curve risk: The risk to earnings and/or value due to changes in the level or slope of underlying yield curves. Financial instruments can be sensitive to different points on the curve. This can cause returns to vary as yield curves change.

THE INTEREST RATE ENVIRONMENT

A Unique Period in American Financial History

Because the majority of credit union investments are now held outside other financial institutions, credit unions will have periodic price risk. What makes this current risk period unique is that interest rates are most likely to rise, since the United States has historically low interest rates currently imposed by the Federal Reserve. Although the impact of rising interest rates can be mitigated somewhat by underlying cash flows in the investments, rising rates will generally cause the value of investments to fall, possibly dramatically. Although no one can predict when or how high interest rates will rise, the likelihood that longer-maturity investments will see higher interest rate environments is almost certain. Credit unions whose survival would come into question under a high interest rate environment will have very difficult examinations.

Concerns over Liquidity

The NCUA is also concerned with credit union liquidity in a rising interest rate environment. In a normal interest rate environment, a credit union would purchase securities with the intent to buy and hold till maturity so interim fluctuations in value are not a major concern. Some of the investments can be sold can help the credit union manage liquidity problems, such as the funding of loans, savings withdrawals or other cash needs. Unfortunately, the ability to reach into the investment portfolio can be compromised in a rising interest rate environment. Simply put, the investments are harder to sell for value. When investment rates rise, the investment portfolio becomes less and less liquid as potential losses upon sale increase. All investors who are in the same position want to dump the investment as well. The investments become "frozen" unless the credit union can take a loss in converting the investment to cash. Moreover, credit union management and examiners generally are adverse to see these kinds of losses on the books.

This also requires credit union management to rebalance portfolios in rising rate environments. Some managers may not have even experienced this type of environment. NCUA Examiners may not discern between securities held for maturity and securities available for sale, as defined by FASB. As a result, the NCUA may require credit unions to shock both of these investment buckets when completing NEV calculations. This could further complicate the credit union's risk management.

"... policy limits on IRR exposure are not adequate if they allow a credit union to operate with an exposure that is unsafe or unsound, which means that the credit union may suffer material losses under plausible adverse circumstances as a result of this exposure."

The NCUA submission to Congress discussing revised Rules and Regulations Part 741

The Federal Reserve Response

The Federal Reserve recognizes the possibility of catastrophe in a rising interest rate marketplace. The Federal Reserve has taken two actions in an effort to fend off a liquidity crisis in the securities markets. The first is the Federal Reserve will be "tapering" easy money purchases of securities. By doing so, the Federal Reserve expects investments currently held will lose value unless held to maturity. "Tapering" is intended to allow the longer end of the yield curve to rise to more normal levels. Without this, the vast majority of investors would likely attempt to sell their securities all at once, which would cause the markets to crash and possibly initiate another Recession.

The Federal Reserve also indicated that it will keep short term rates at current low levels for a period of time. By doing so, financial institutions are placed in an environment allowing no good opportunity to reposition investments, and not purchase investments with long maturities, until the scope and extent of the rate increases are known.

PREPARING FOR AN EXAM

What to Do before the Examiner Arrives

When the NCUA arrives for an examination, management should expect an assessment on investment risk management, and the credit union's ability to make the transition to the expected higher rates. High among the risk management concerns will be whether the credit union has the capacity to meet loan demand without tapping into the investment pool and selling investments at a loss.

Managing this risk is the role of the ALM reviews and the shock tests that are part of the modeling process. Credit unions forced to sell too many securities could result in losses that may reduce capital in extreme cases. However, in the event NCUA performs their own shock on the portfolio and determines that the level of price risk is excessive in relationship to net worth, regardless of the other attributes of the ALM model, they very likely will find the credit union's price risk to be excessive and possibly to the point of jeopardizing the safety and soundness of the credit union.

Although there are many ways to model and manage price risk in investments, the NCUA is likely to stress the investment portfolio based on a scenario where interest rates fall or rise between -300bps and +300bps. (State supervisory authorities may have different stress testing models). If the current ALM model used by the credit union does not support this kind of stress testing, the credit union may need to supplement its regular ALM reviews. Although the regulation specifically speaks to the change in Net Economic Value (NEV) based upon interest rate shocks in practice, it appears examiners are actually subtracting the change in market value from net worth and testing it against PCA standards.

ALM modeling should take into consideration investment price risk and its effect on the credit union's liquidity and capital after potential losses are taken into consideration. Once completed, credit union management needs to have a written risk mitigation plan based on the findings.

Primary Areas of Examiner Focus

There are three key areas to review:

How does the amount of price risk compare to the net worth (capital) of the credit union? Credit unions will likely face examiner action if the price risk is **greater than 50%** of the credit union's net worth or if the resulting losses push the credit union's net worth falls below 4%.

Does the credit union have a price risk limit (limit as a percentage of net worth) for a +300bps shock for each investment regardless if they are held-to-maturity or available-for-sale? Depending on overall price riskiness of the portfolio, examiners may want limits to be set at no more than 35-40% of net worth for a +300bps shock.

What impact would rising interest rates have on the liquidity of the credit union? Examiners may want to see evidence of contingency plans in the event that in a +300bps shock there are deposit outflows with a reduction in asset cash flows. Include in this review the dependence on core deposits and analytics or non-term share accounts as well as the impact of prepayment speeds changing based upon the direction of shock.

These terms may also be important to know:

Extension risk mainly occurs in mortgage-backed securities where in a rising interest rate environment the expected maturity increases in duration due to the deceleration of prepayments. (The opposite is *prepayment risk* where in a low interest rate environment people pay off their loans quickly.)

Most mortgage backed securities are **negatively convex**; this means that when interest rates rise, the price of these securities falls sharply (as with long term bonds), but in a lower interest rate environment the price rises slowly or not at all. This is because homeowners tend to refinance as interest rates fall and to delay pre-payments as interest rates rise. A credit union heavily invested in mortgage-backed securities needs to have a plan demonstrating the yield justifies the risk in holding mortgage-backed securities. MBSs and CMOs that have callable features, extended and not-defined tranches, or weighted average lives that extend beyond five years will likely cause examiners to question the investment strategy of the credit union regardless of other mitigating balance sheet offsets.

Best Practices

During the course of the last three years net interest margins have fallen dramatically as higher yielding loans and investments have either paid off or matured, and are rapidly replaced with lower yielding assets. A growing practice for some credit unions is to move out on the yield curve and/or invest in more complex higher yielding investments in an effort to improve earnings. NCUA has concerns about this practice and to some degree is treating it much like they do with loan concentration risk. This is not the first time in credit union history where these types of investments have come under scrutiny. During the late 1980s, many financial institutions had to window investments for market losses during the increasing interest rate environment. During that time examiners pressured many credit unions to sell at steep losses, establish policies to window the market loss based upon specific interest rate scenarios, and perform excessive shock tests based upon potential changes in the interest rate environment.

When making investment choices and portfolio risk assessments, committees, management and the board should have certain items documented in the event of examiner challenge:

- Documentation of at least two price quotes for the investment
- Prepayment speed assumptions under multiple interest rate scenarios
- As part of the quarterly ALCO, calculate and compare the amount of market price loss in the investment portfolio to prior periods and compare the amount to overall net worth
- Updated IRR policy including a price risk limit in a 300 basis point up shock test as a percentage of networth
- Review CMOs and understand the relationships between deal structure, coupon rate, and collateral
- At what point will there be interrupted cash flows, especially with respect to prepayment
- Document your core deposit study and don't be overly reliant on assumptions made during a low interest rate environment
- Review all callable securities and understand the likelihood of call with regard to negative yields. Callable securities are being called even in very small interest rate variations
- Non-term share duration analysis looking back more than 5 years
- Perform income simulations on the ALM model beyond 12 months to at least 36 months and understand earnings pressures on a longer horizon
- Perform liquidity shock tests under multiple interest rate environments and include early warning measurements to proactively address potential future issues

Managing price risk is nothing new to credit unions or regulators. The only change that has occurred over the last 30 years is that NCUA has taken a position and made it a regulation that improper management of IRR is grounds for adverse action, including the retraction of share insurance from a perceived poorly managed portfolio. The major change is that price risk is being evaluated in relation to the credit unions capital in and evaluated against the resulting liquidity. Price risk calculations under a 300 basis point shock with a resulting market value fluctuation that equates to over 50% of the credit unions capital will be found to be unsafe and unsound and will require the credit union to adjust the portfolio regardless of current price or ALM modeling results. We have heard comments that credit unions found in this scenario will likely have exam findings such as, "management does not understand the level of interest rate risk and resulting liquidity risk and skilled resources must be obtained to analyze and control the risks moving forward," including the prohibition of purchasing investments beyond a specified final maturity.

The commentaries in NCUA 741 explicitly state the expanded price risk checklists have significantly increased. A credit union without solid analytics, testing scenarios, and argument-winning strategies may have serious difficulty investing in anything outside of a laddered CD portfolio. This is the new reality facing credit unions with complex investment strategies and understanding and preparing for the change in examination protocols is now a necessity.