

Introduction – Sensitivity

Sensitivity to market risk is one of the most complex areas of banking and it's an area where most directors have limited experience. Fortunately, a lack of expertise in this area does not eliminate your ability to provide valuable input. Your outside, non-banking experiences can provide a strong platform from which you can improve your bank's sensitivity to market risk management and more specifically, interest rate risk (IRR) monitoring. Go to the "Next" button below to begin the instructional content for sensitivity to market risk.

Sensitivity to Market Risk

What is Sensitivity to Market Risk?

Sensitivity to Market Risk - refers to the risk that changes in market conditions could adversely impact earnings and/or capital.

Market Risk encompasses exposures associated with changes in interest rates, foreign exchange rates, commodity prices, equity prices, etc. While all of these items are important, the primary risk in most banks is interest rate risk (IRR), which will be the focus of this module. We will provide a simple overview, designed to familiarize new directors with basic aspects of IRR, including ways that you, as a director, can help oversee IRR management. This module will not turn you into an IRR expert. Our goal is to give you enough information to help you understand what your bank's asset/liability committee (ALCO) reports are saying and to introduce you to a few key aspects of the Joint Agency Policy Statement on Interest Rate Risk.

Interest Rate Risk Basics

In the most simplistic terms, interest rate risk is a balancing act. Banks are trying to balance the quantity of repricing assets with the quantity of repricing liabilities. For example, when a bank has more liabilities repricing in a rising rate environment than assets repricing, the net interest margin (NIM) shrinks. Conversely, if your bank is asset sensitive in a rising interest rate environment, your NIM will improve because you have more assets repricing at higher rates.

An extreme example of a repricing imbalance would be funding 30-year fixed-rate mortgages with 6-month CDs. You can see that in a rising rate environment the impact on the NIM could be devastating as the liabilities reprice at higher rates but the assets do not. Because of this exposure, banks are required to monitor and control IRR and to maintain a reasonably well-balanced position.

What level of exposure is appropriate?

The regulatory agencies do not dictate in policy what an acceptable amount of interest rate risk is because that amount will vary by institution. We recognize that a banker's job is to manage risk and, in many cases, to profit from taking risk. In fact, most banks will consciously take an asset or liability sensitive position depending upon management's expectations for interest rate movements. It is, however, the board's responsibility to determine what level of exposure is acceptable depending upon the board's overall tolerance for risk.

Your job as a director is to ensure that the level of risk taken is appropriate for the institution and to ensure that the risk is well understood. Regulators will take exception to a given level of IRR, if that exposure is imprudent relative to the level of earnings,

capital, and the strength of IRR management. If the bank is taking on higher levels of IRR, it will need to maintain higher levels of capital and have higher levels of earnings. This is necessary to provide a buffer in case the position that the bank has taken (i.e. asset or liability sensitive) hurts instead of helps its margins. Additionally, as IRR increases, the quality of IRR management will need to improve commensurately.

IRR Measurement

There are many ways to monitor exposure to IRR. Measurement systems vary in complexity from very simple methods such as a gap model, to very sophisticated models such as a simulation or duration analysis. We will work with an abbreviated gap model in this exercise, which simply measures the net quantity of assets or liabilities repricing within a given period to estimate the likely impact that changes in interest rates will have on earnings. This is not a recommendation, and in many cases, this type of analysis will be far too simplistic. This example is used because it explains simply the exposure that we are trying to measure.

Account	Balance	Repricing Time Frame		
		0-12 months	1-5 years	>5 years
Cash	13,000			
Investments	26,000	10,000	12,000	4,000
Loans	170,000	94,000	68,000	8,000
Federal funds	1,200	1,200	0	0
Premises	2,000	0	0	0
Other Assets	5,000	0	0	0
Totals	217,200	105,200	80,000	12,000
Deposits	160,000	132,000	28,000	0
Borrowings	35,000	20,000	15,000	0
Other Liabilities	4,000	0	0	0
Totals	199,000	152,000	43,000	0
Gap (RSA-RSL)		(46,800)	37,000	12,000
Cumulative Gap		(46,800)	(9,800)	2,200
Gap Ratio (Gap/Earning Assets)		-23.7%		

The chart above shows a gap ratio of negative 23.7%, indicating a significant amount of liability sensitivity over the next 12 months. During this time, management will have to reprice approximately \$152 million in liabilities but will have only \$105 million in assets reprice. This chart suggests that a rising interest rate environment would have a negative impact on interest margins. Specifically, with an additional \$46.8 million in liabilities repricing, the model predicts that a 100 basis point rise in rates would cost the bank an estimated \$468,000 in income – a substantial amount for most community banks.

While this example does an excellent job of describing what IRR is, it does not necessarily provide an accurate assessment of the exposure. Most people familiar with IRR would suggest that this model has significantly overstated liability sensitivity. To make this model more accurate, they would recommend that management incorporate certain assumptions that reflect the true characteristics of these assets and liabilities. Those assumptions are similar to assumptions used in all types of IRR analysis, not just the simple gap model. For example, your bank's IRR model probably doesn't assume that all liabilities reprice at the same pace as adjustable rate assets, especially in a rising rate environment. This assumption and others listed below are necessary to make every IRR measurement tool more accurate.

Which of the following assumptions are incorporated into your IRR models?

1. Liabilities will reprice more slowly in a rising rate environment
2. Deposits in 2005 will reprice more slowly (or not at all) in a declining interest rate because interest rates are already so low
3. Some fixed rate assets (loans or investment securities) will reprice (refinance) when interest rates fall regardless of contractual maturity
4. Some loans may pay down more rapidly in a rising rate environment because borrowing is not as attractive – thereby hurting bank income by decreasing the amount of loans outstanding
5. Mortgages will payoff in 7 years regardless of contractual maturity
6. Callable securities will reprice if interest rates fall to a certain level
7. The yield curve will get steeper
8. The yield curve will get flatter

This is just a sampling of assumptions that could be detailed in an interest rate risk analysis. Your bank will have to decide what is appropriate, and you will need to regularly test the model to determine its accuracy (more on this later). Remember, you don't have to be a CFO to contribute. Think about these assumptions above. None of them is exceptionally complex, and each could have a material impact on your model's estimated IRR. The board and the management team will need to decide whether or not these assumptions are applicable to your bank, and this is where you can be the most help to an overtaxed CFO. Directors need to use the knowledge developed in their own personal and professional business dealings to improve the bank's IRR model by paying attention to the validity of the assumptions. Your model will never be 100% accurate, and it will constantly require changes as your institution and the marketplace evolve.

Statement of Policy

In addition to your own personal experiences, directors can call upon guidance provided by the regulators when attempting to understand the Sensitivity to Market Risk component. When Sensitivity to Market Risk became a component rating in 1996, the Federal Financial Institutions Examination Council (FFIEC) provided a Joint Agency

Policy Statement on Interest Rate Risk, detailing examination treatment as well as management and board responsibilities. Again, the purpose of this lesson plan is to give you just the basics, so we won't address the Statement of Policy (SOP) in its entirety. Rather, we will focus on just a few aspects of the SOP that are particularly relevant to directors. If you would like the full SOP, you can find this document at:

<http://www.fdic.gov/regulations/laws/rules/5000-4200.html>

Basic Board Responsibilities

According to the SOP, a bank's board of directors has the following two broad responsibilities:

- To establish and guide the bank's tolerance for interest rate risk, including approving relevant risk limits and other key policies and ensuring adequate resources are devoted to interest rate risk management
- To monitor the bank's overall interest rate risk profile and ensure that the level of interest rate risk is maintained at prudent levels

In order to carry out these responsibilities, you need to ensure that your bank has a sound risk management process for IRR. Effective control of interest rate risk requires a comprehensive risk management process that includes the following elements:

- Policies and procedures that include risk limits designed to control the nature and amount of IRR the bank takes
- A system for identifying and measuring IRR
- A system for monitoring and reporting risk exposures
- A system of internal controls, review and audit to ensure the integrity of the overall risk management process

An important responsibility for you as directors is to ensure that the management team has adequate resources to manage sensitivity. For example, the complexity of the model chosen to measure IRR should match the complexity of operations. If you have callable securities, long-term assets/liabilities, a significant derivatives portfolio, etc., your bank will likely require an IRR measurement tool with more complexity than the simple gap analysis above. In this type of situation, your management team would need to utilize a model that would account for variances in price and cash flow, such as a duration or simulation analysis.

Also, the board needs to ensure that management documents the assumptions utilized in the IRR measurement tool and that the assumptions are reasonable. Again, this is where you, as a director, can have a significant impact on IRR management. Did you refinance your personal and/or corporate debt in the last five years because interest rates fell so dramatically? It's likely that you did and it's also likely that the longer-term commercial credits in your bank's portfolio did the same. Make sure that the bank's model accounts for the depositors' and borrowers' likely behavior in addition to contractual terms.

Finally, the board needs to ensure that the IRR program is subject to a periodic independent review, and that the findings of the review are presented to the directorate on an annual basis. This means that someone who is not affiliated with IRR measurement (and does not work for the officers responsible for IRR measurement) reviews the model to determine its appropriateness and accuracy. In many cases, particularly at smaller banks, this activity is outsourced to a third party; however, if the resources are available, this can be an excellent opportunity to cross train employees. Most importantly, variance analysis should be done at least annually to identify material differences between actual and forecasted results.

Red Flags

In addition to the contributions listed above, directors can help manage IRR by looking for red flags such as:

- **A substantial change in the NIM** – Look for substantial decreases or increases in the NIM. Changes in both directions could indicate that the model is inaccurate and that the bank is taking on more IRR than expected or allowed by policy. Keep in mind, however, that significant changes in the NIM are not necessarily related to IRR. Changes in the balance sheet such as changing the percentage of earning assets, changing the risk profile, or changing the quantity of non-interest bearing funds can all affect the NIM.
- **IRR exposure that regularly exceeds board established limits** - In this case, the board should require that the exception be documented and explained, and corrective action should be detailed.
- **Failure to adhere to the SOP** – Particularly the items listed above.

Examiner Assessment Criteria

As mentioned above, there is no set level of IRR that examiners will consider satisfactory. Examiners will always assess sensitivity to market risk relative to the level of earnings, the level of capital, and the quality of IRR management. Higher levels of earnings and capital provide a larger cushion, which allows banks to take on a greater quantity of IRR. Secondly, the more risk you take, the better IRR management needs to be with regard to adherence to the Statement of Policy and the accuracy of the IRR measurement tool.

Let's try to apply some of this to our subject bank. Please read the sensitivity to market risk comment in our sample Report of Examination.

Examination Conclusions and Comments

SENSITIVITY TO MARKET RISK

Sensitivity to market risk is limited to interest rate risk (IRR) and is considered satisfactory. Exposure to IRR is moderate and management of the IRR function continues to be effective. As of our examination date, the bank's interest rate risk model indicated that a +/-200 basis point change in market interest rates would have a modest +/-21 basis point impact on the net interest margin. This remains well within board-approved policy parameters; however, the lower levels of earnings and capital require that management remain in a reasonably well-balanced position.

Discussion Points - Sensitivity to Market Risk

The Report of Examination details critical aspects of the sensitivity component that should help us come to a reasonably accurate rating. That said, if you are following the intended lesson plan, you have not yet read about the strengths and weaknesses of capital, earnings, or management, which, as we have mentioned throughout this examination exercise, are critical aspects of the sensitivity component. Some of the notable issues identified in the comment include:

- Sensitivity to market risk is “satisfactory”
- Exposure to IRR is moderate and management is effective
- The level of IRR is within board-approved policies
- The lower levels of bank earnings and capital require a well-balanced IRR position

This comment should give you enough information to rate the component.

Rating Sensitivity to Market Risk

The following is an excerpt from the Uniform Financial Institutions Ratings System. Take a couple minutes to read the ratings guide and rate the sensitivity to market risk component for First State Bank.

Uniform Financial Institution Ratings System

The sensitivity to market risk component reflects the degree to which changes in interest rates, foreign exchange rates, commodity prices, or equity prices can adversely affect a financial institution's earnings or economic capital. When evaluating this component, consideration should be given to: management's ability to identify, measure, monitor, and control market risk; the institution's size; the nature and complexity of its activities; and the adequacy of its capital and earnings in relation to its level of market risk exposure.

For many institutions, the primary source of market risk arises from nontrading positions and their sensitivity to changes in interest rates. In some larger institutions, foreign operations can be a significant source of market risk. For some institutions, trading activities are a major source of market risk.

Market risk is rated based upon, but not limited to, an assessment of the following evaluation factors:

- The sensitivity of the financial institution's earnings or the economic value of its capital to adverse changes in interest rates, foreign exchange rates, commodity prices, or equity prices
- The ability of management to identify, measure, monitor, and control exposure to market risk given the institution's size, complexity, and risk profile
- The nature and complexity of interest rate risk exposure arising from non-trading positions
- Where appropriate, the nature and complexity of market risk exposure arising from trading and foreign operations

Ratings

1. A rating of "1" indicates that market risk sensitivity is well controlled and that there is minimal potential that the earnings performance or capital position will be adversely affected. Risk management practices are strong for the size, sophistication, and market risk accepted by the institution. The level of earnings and capital provide substantial support for the degree of market risk taken by the institution.
2. A rating of "2" indicates that market risk sensitivity is adequately controlled and that there is only moderate potential that the earnings performance or capital position will be adversely affected. Risk management practices are satisfactory for the size, sophistication, and market risk accepted by the institution. The level

- of earnings and capital provide adequate support for the degree of market risk taken by the institution.
3. A rating of “3” indicates that control of market risk sensitivity needs improvement or that there is significant potential that the earnings performance or capital position will be adversely affected. Risk management practices need to be improved given the size, sophistication, and level of market risk accepted by the institution. The level of earnings and capital may not adequately support the degree of market risk taken by the institution.
 4. A rating of “4” indicates that control of market risk sensitivity is unacceptable or that there is high potential that the earnings performance or capital position will be adversely affected. Risk management practices are deficient for the size, sophistication, and level of market risk accepted by the institution. The level of earnings and capital provide inadequate support for the degree of market risk taken by the institution.
 5. A rating of “5” indicates that control of market risk sensitivity is unacceptable or that the level of market risk taken by the institution is an imminent threat to its viability. Risk management practices are wholly inadequate for the size, sophistication, and level of market risk accepted by the institution.

What do you think sensitivity should be rated? Keep in mind, that sensitivity was rated a “2” at the last examination.

1. Strong ([link to Sensitivity answer](#))
2. Satisfactory ([link to Sensitivity answer](#))
3. Less than Satisfactory ([link to Sensitivity answer](#))
4. Unsatisfactory ([link to Sensitivity answer](#))
5. Critically deficient ([link to Sensitivity answer](#))

Answer: Examiners rated this bank’s sensitivity to market risk component a “2”. The use of the word “satisfactory” was a strong hint, but also the examiners noted that exposure to changes in interest rates was moderate and that management was satisfactory. The only concern was the lack of earnings and capital to provide a significant buffer. A downgrade to a “3” is possible if the institution increases the amount of IRR taken without a corresponding increase in capital/earnings, or if IRR management deteriorates and the examiners are no longer confident that the calculated exposure properly depicts the actual exposure.

Now let’s move on to the earnings module.