

Chapter 1 : Interest Rate Risk

Interest rate risk exists in an interest-bearing asset, such as a loan or a bond, due to the possibility of a change in the asset's value resulting from the variability of interest rates. Interest.

Share Loading the player Interest rate risk management has become very important, and assorted instruments have been developed to deal with interest rate risk. This article looks at several ways that both businesses and consumers manage interest rate risk using various interest rate derivative instruments. Interest rate risk is the risk that arises when the absolute level of interest rates fluctuate. Interest rate risk directly affects the values of fixed-income securities. Since interest rates and bond prices are inversely related, the risk associated with a rise in interest rates causes bond prices to fall, and vice versa. Bond investors, specifically those who invest in long-term fixed-rate bonds, are more directly susceptible to interest rate risk. If, during this time, interest rates rise to 3. In contrast, changes in interest rates also affect equity investors but less directly than bond investors. This could result in the corporation postponing borrowing, which may result in less spending. This decrease in spending may slow down corporate growth and result in decreased profit and ultimately lower stock prices for investors. Interest Rate Risk Should Not Be Ignored As with any risk-management assessment, there is always the option to do nothing, and that is what many people do. However, in circumstances of unpredictability, sometimes not hedging is disastrous. Yes, there is a cost to hedging, but what is the cost of a major move in the wrong direction? One need only look to Orange County, California, in to see evidence of the pitfalls of ignoring the threat of interest rate risk. In a nutshell, Orange County Treasurer Robert Citron borrowed money at lower short-term rates and lent money at higher long-term rates. The strategy was initially great as short-term rates fell and the normal yield curve was maintained. But when the curve began to turn and approach inverted yield curve status, things changed. A forward contract is the most basic interest rate management product. The idea is simple, and many other products discussed in this article are based on this idea of an agreement today for an exchange of something at a specific future date. An FRA is based on the idea of a forward contract, where the determinant of gain or loss is an interest rate. Under this agreement, one party pays a fixed interest rate and receives a floating interest rate equal to a reference rate. The actual payments are calculated based on a notional principal amount and paid at intervals determined by the parties. FRAs are always settled in cash. FRA users are typically borrowers or lenders with a single future date on which they are exposed to interest rate risk. A series of FRAs is similar to a swap discussed below ; however, in a swap all payments are at the same rate. Each FRA in a series is priced at a different rate, unless the term structure is flat. Just like it sounds, a swap is an exchange. More specifically, an interest rate swap looks a lot like a combination of FRAs and involves an agreement between counterparties to exchange sets of future cash flows. The most common type of interest rate swap is a plain vanilla swap, which involves one party paying a fixed interest rate and receiving a floating rate, and the other party paying a floating rate and receiving a fixed rate. These instruments are useful in protecting the parties involved in a floating-rate loan, such as adjustable-rate mortgages ARMs. A grouping of interest rate call options is referred to as an interest rate cap; a combination of interest rate put options is referred to as an interest rate floor. In general, a cap is like a call and a floor is like a put. A swaption , or swap option, is simply an option to enter into a swap. Many investors encounter interest management derivative instruments via embedded options. If you have ever bought a bond with a call provision , you too are in the club. The issuer of your callable bond is insuring that if interest rates decline, they can call in your bond and issue new bonds with a lower coupon. The payments are designed to offset interest rate increases on a floating-rate loan. If the actual interest rate exceeds the strike rate, the seller pays the difference between the strike and the interest rate multiplied by the notional principal. The interest rate cap is actually a series of component options, or "caplets," for each period the cap agreement exists. Just as a put option is considered the mirror image of a call option, the floor is the mirror image of the cap. The interest rate floor , like the cap, is actually a series of component options, except that they are put options and the series components are referred to as "floorlets. A lender uses this to protect against falling rates on an outstanding floating-rate loan. A protective collar can also help manage interest rate risk. Collaring is

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accomplished by simultaneously buying a cap and selling a floor or vice versa , just like a collar protects an investor who is long on a stock. The Bottom Line Each of these products provides a way to hedge interest rate risk, with different products more appropriate for different scenarios. There is, however, no free lunch. Trading Center Want to learn how to invest? Get a free 10 week email series that will teach you how to start investing. Delivered twice a week, straight to your inbox.

Chapter 2 : Managing interest rate risk with swaps & hedging strategies

Interest-Rate Risk Management Section Interest-rate risk (IRR) is the exposure of an institution's financial condition to adverse move-

January 11, by Tom Farin So you have the responsibility to update the interest rate risk management program for your institution. The effectiveness of your redesigned IRR program depends to a great extent on your response to five key questions. First, what are you attempting to measure and how will it be measured? Second, what is your philosophy toward interest rate risk? Third, should your measurement system be static or dynamic? Fourth, what kinds of interest rate shocks should you use in stress testing your institution? Fifth, what thought processes will you use to establish policy limits for interest rate risk. The first three questions will be discussed in this article. The fourth and fifth topics will be discussed in part 2 of this series in the next issue of the newsletter. Managers are accountable to directors for putting net income on the bottom line. Anything that would mess with the bottom line net income is appropriately a concern of management. On the other hand, regulators focus on liquidation value. But the movement to tools measuring the regulatory definition of interest rate risk raises an interesting issue for managers. Do you change your focus from income to market value as an IRR measurement tool? Or do you adopt a measurement system that measures the effect of rate shocks on both income and market value? Measurement systems that measure both income and market value risk best meet the needs of both managers and regulator. No matter how hard the regulator pounds away at the importance of market value analysis, your board will hold you responsible for what you put on the bottom line. So your measurement system needs to focus on the effect of rate shocks on income for management purposes. Your system also needs to focus on the effect of rate shocks on market value for regulatory compliance purposes. The objective of many financial institutions is to maintain interest rate risk at a level as close to zero as possible. They take on interest rate risk if it improves their ability to accomplish long-range profitability, growth, capitalization, and dividend goals. These managers set policy limits that keep potential losses due to adverse movements in market rates at affordable levels. They see interest rate risk in the same way they see credit risk – an opportunity to make money through effective risk management. Financial institutions for the most part choose from the following four approaches. Because their objective is to maintain zero interest rate risk, they place retail loans in their portfolio only when ideally suited retail funding is available. As a result, managers in institutions pursuing the retail liability strategy primarily portfolio variable rate loans and fixed rate loans with relatively short-term maturities. Long-term fixed rate loans like mortgages are only made if they conform to secondary market standards and are immediately sold in the secondary market. The retail liability approach minimizes interest rate risk. It is crucial the management team believe there is a better than average chance rates will move in the direction of the forecast. They make their money by running the institution so it will benefit when rates move in the forecast direction. As Figure 4 indicates, those taking the Economist approach will run a positively rate sensitive institution when they believe rates will rise and a negatively rate sensitive institution when they believe rates will fall. The table also shows how a properly set up institution would appear to gap analysis, income simulation, duration, and MVPE oriented measurement systems. In one form of the economist approach managers of institutions use the slope of the yield curve to enhance net income. As this article was written, the treasury yield curve appeared as shown in Figure 5. Because the yield curve was positively sloping, an institution could make money by booking longer duration assets funded by shorter duration liabilities. It funds them with four-year duration liabilities priced off four-year treasury yields of 4. As long as rates remain flat it will pick up the 50 bp spread in the yield curve as additional income. Managers of institutions using the yield curve to enhance income are making an implied rate forecast. If long-term rates are higher than short-term rates, the market is predicting that rates will rise. If rates rise, institutions will suffer a decline in both income and market value. How many ARM customers will see their salaries increase to cover their increased mortgage payments in a rising rate environment? With rates at the bottom of the cycle, loan customers, particularly nonconforming loan customers, are willing to pay a premium for fixed-rate loans. They need to be bribed heavily with rate, caps, and other incentives to accept

adjustable rate loans. Retail deposit customers are often willing to accept treasury or sub-treasury rates on short-term CDs but require a significant premium over treasury before committing funds to long-term CDs. They accept fixed rate loans for portfolio purposes, especially nonconforming loans offering significant spreads over secondary market rates. They also accept short-term CDs and core deposits, as long as they can find them at sub-treasury rates. They use the wholesale markets to offset the interest rate risk they are incurring in the retail markets. This may mean investing primarily in short-term securities to balance long-term loans. More sophisticated institutions may use instruments like interest rate swaps and caps. Rather, the management team is attempting to maximize performance while keeping interest rate risk within its policy limits. Review the MCNB case in the previous issue. The results are startling. The damage is limited by setting and maintaining compliance with appropriate policy limits. The Uncovered Option Approach Under the uncovered option approach, financial institutions place a substantial portion of the asset side of their balance sheet in financial instruments with imbedded options. They receive a higher yield on these instruments to compensate for the risk associated with the option. They fund the assets with similar duration liabilities that do not have the same options. Because they receive a higher rate on the asset side and do not have to compensate their funding sources for options on the liability side, they pick up additional spread. Depending on the imbedded options, significant movements in market rates in either direction could result in declines in net income and liquidation value. An example of an uncovered option strategy was discussed in the duration article in the May-June issue of the newsletter. However, as Figure 6 shows, rate movements affect prepayments on the MBS but not the advances. Uncovered option strategies are found to a greater or lesser extent in all retail financial institutions. Thrifts, because of their heavy mortgage concentration, typically have more uncovered option risk than banks and credit unions. Managing this kind of risk requires fairly sophisticated measurement systems and well conceived policy limits. What strategy is best for your institution? Should you minimize interest rate risk with the retail liability approach? Try the economist approach? Incur some uncovered option risk? Or should you employ some combination of the three depending on customer demand, your willingness to take on risk, and your confidence in your rate forecasts? It is helpful to examine the potential effect of each approach under a variety of rate environments before making your decision. Dynamic modeling is the only technique that allows you to test a strategy before it is implemented. Static Vs Dynamic Interest Rate Risk Measurement Most management teams measure interest rate risk based on their most recent set of financial reports. The window of opportunity for their implementation has closed. Regulatory interest rate risk measurement systems are always static. The same analysis is performed for the remaining three strategies. They cheer when they see the results from the flat rate environment. The ROA goal of 1. Unfortunately, the 40 bp drop to 1. The strategy must be rejected as being too risky. Strategy 2 involves taking on considerably less interest rate risk than Strategy 1. When modeled, Strategy 2 shows a 1. All risk of ROA fluctuation is removed by the strategy! The management team can expect a regulatory pat on the back if Strategy 2 is implemented. They would also deserve a boot in the rear from their board of directors! The problem with Strategy 2 is apparent if we evaluate interest rate risk strategies the same way we evaluate insurance policies. In selecting between insurance policies we ask two questions. Second, does it provide the necessary level of protection? The insurance premium associated with selecting Strategy 2 over Strategy 1 is the 0. The benefit of Strategy 2 should be better performance protection should an adverse rate environment occur. Modeling results show that implementing Strategy 3 would cause some interest rate risk exposure. In comparison to Strategy 1, Strategy 3 would involve paying a 5 bp ROA premium for 15 bp of protection in an adverse rate environment. Strategy 3 is a decent insurance buy. Strategy 4 reduces interest rate risk even more than Strategy 3. In comparison to Strategy 1, Strategy 4 requires a 10 bp ROA premium for 20 bp worth of protection another decent insurance buy. Which strategy should ABC choose? In deciding between Strategy 3 and 4, ABC would. Given that Strategy 4 involves taking on less risk than Strategy 3, how risk adverse is the management team and board? A review of the quantitative results from the simulation model and the qualitative answers to the above questions should lead to the selection of the most appropriate strategy. Using a dynamic approach to strategy selection requires use of a simulation model. This article provides answers to three of the five questions posed.

Chapter 3 : Interest rate risk - Wikipedia

Interest rate risk management is a key component in the management of market risk. These guidelines describe principles the regulated entities should follow to.

Interest rate risk management is a key component in the management of market risk. These guidelines describe principles the regulated entities should follow to identify, measure, monitor, and control interest rate risk. The AB is organized as follows: Responsibilities of the Board B. Responsibilities of Senior Management C. Risk Management Roles and Responsibilities D. Policies and Procedures II. Interest Rate Risk Mitigation C. Scenario Analysis and Stress Testing C. Monitoring and Reporting Background Interest rate risk is the risk that changes in interest rates may adversely affect financial condition and performance. More specifically, interest rate risk is the sensitivity of cash flows, reported earnings, and economic value to changes in interest rates. As interest rates change, expected cash flows to and from a regulated entity change. The regulated entities may be exposed to changes in: Interest rate risk may include repricing risk, basis risk, option risk, option-adjusted spread OAS risk, prepayment risk, and model risk. Excessive interest rate risk can threaten liquidity, earnings, capital, and solvency. The regulated entities can manage interest rate risk with respect to economic value of equity, earnings, or both. These approaches are complementary because they provide different types of relevant information, but each has limitations. A common risk management objective is to keep the market value of equity from falling below pre-specified limits over a range of interest rate scenarios. One limitation of this approach is that market value measures do not identify when future earnings problems may occur. When the focus is on earnings, the risk management objective is to maintain earnings within an acceptable range over specified time horizons, which are generally short-term, ranging from one year to five years. If the objective is to ensure that net income will remain within certain parameters during the given time period over a range of interest rate scenarios, management overlooks risks that exist beyond the forecast horizon. Standard 3 Management of Market Risk Exposure highlights the expectation for each regulated entity to have a clearly defined and well-documented strategy for managing market risk and establishes responsibilities for the board of directors or delegated board committee board and senior management. Standard 2 Independence and Adequacy of Internal Audit Systems and Standard 8 Overall Risk Management Processes include responsibilities for internal audit, the board, and senior management along with an independent risk management function. An effective interest rate risk management function includes appropriate management of risk exposure, policies and procedures, risk limits, internal controls, risk measurement systems, monitoring, and reporting. A regulated entity should periodically review industry standards with regard to interest rate risk management. Responsibilities of the Board The board should oversee the adequacy of actions taken by senior management to identify, measure, manage, control, and report on interest rate risk exposures. The board should approve major strategies and policies relating to the management of interest rate risk. The board should review interest rate risk exposures on a periodic basis. As a group, the board should have the requisite knowledge and background to assess the information provided and recommend further actions. At least annually, or more frequently if there are significant changes in market or financial conditions, the board should review the interest rate risk management framework and major policies, limits, and internal controls. The board should document any changes to board-approved interest rate risk limits in its minutes. The board should also ensure that management takes appropriate corrective measures when interest rate risk limit breaches occur. Responsibilities of Senior Management Senior management implements board-approved strategies and policies relating to the management of interest rate risk. Senior management should ensure interest rate risk policies and procedures are clearly written, sufficiently detailed, adhered to, periodically reviewed, and should recommend updates for board approval, as appropriate. Senior management should ensure adequate organizational structure, systems, and resources are available to manage and control interest rate risk, and that personnel are appropriately trained and competent. Senior management should inform the board of how changing market conditions could affect interest rate risk exposure. Senior management should report interest rate risk limit breaches to the board and identify appropriate remedial

actions. Risk Management Roles and Responsibilities Policies and procedures should delineate the roles and responsibilities of persons assigned to measure, manage and control interest rate risk so they operate with sufficient independence from the business units, as applicable.

Chapter 4 : Developing A Dynamic Interest Rate Risk Management Program

The management of interest rate risk is an important part of corporate risk management. The active management of interest rate exposure minimises the risk of incurring losses and opportunity costs from movements in interest rates. In the first of four articles on interest rate risk management, we.

Interest rate risk management is an important part of corporate risk management. The active management of interest rate exposure minimises the risk of incurring losses and opportunity costs from movements in interest rates. In the first of four articles on interest rate risk management, we define interest rate risk and focus on the methods of measuring interest rate risk exposure. As a consequence, interest rate risk could result in higher costs, a loss of earnings and diminished profits. Changing interest rates can impact companies in different ways and all companies are sensitive to interest rate movements in one form or another. In the most likely scenario, a company will be a net borrower and the single largest interest rate risk of a company will be the servicing of debt. Increasing interest rates could mean higher interest payments and repayment costs. If, on the other hand, a company is cash-rich, it can be exposed to the risk that interest rates will decrease and impact the size of the yield on its investments. In either case, interest rate exposure is the danger of reduced cash flow, either in the form of diminished cash inflows or increased cash outflows. Therefore, the main danger resulting from interest rate risk is that a company could face liquidity problems. It is often assumed that fixed rate financing does not carry any risks from interest rate changes. However, while fixed rate debt might provide the security of transparent repayment rates, a fall in interest rates would result in opportunity losses because the company cannot benefit from improving interest rates. When to manage interest rate risk When deciding whether or not to manage interest rate risk, the treasurer or risk manager faces the typical dilemma of balancing risks and return. The management of interest rate risks entails costs for the identification and monitoring of risks, together with the payment of premiums and transaction costs when hedging the risk. On the other hand, the company gains a considerable degree of certainty, benefits from improving interest rates and reduces borrowing costs when interest rate risks are managed. This profile will be different for every company and will largely depend on the nature of the business the company operates in. A company that already faces large business risks in its operations is likely to attempt to limit its financial risks such as interest rate risk, whereas a financial institution which derives much of its earnings from interest rate spreads will be more aggressive in trying to profit from interest rate changes. In the majority of cases, corporate treasury will be regarded as a cost centre, offering hedging services rather than aiming for profits by taking riskier positions. In most companies, interest rate risk management will predominantly aim to manage existing and future cash flow exposures. However, in all companies, opportunities to reduce costs or make profits will always contribute to shareholder value and will have to be taken into consideration. The interest rate risk management process Financial risks such as interest rate risks are managed in four general steps: First the risk should be identified. This means all asset and liability positions that are susceptible to a change in interest rates must be established. According to the quantification of interest rate risk a risk policy framework should be formulated. The risk policy can be implemented and the risks controlled. This should be achieved by transforming them into a form with which the company is comfortable. Identifying and measuring interest rate risk Most companies will find that they are exposed to interest rate risk in several ways. This exposure will include all outstanding debt or cash deposits. Equally, the value of other assets and liabilities, or revenues and expenses, may be affected by interest rate changes. The company will need to identify exposures and gain an understanding of how interest rate changes might affect the value of assets and liabilities and impact on cash flows. In order to do so, the interest rate risk needs to be measured. Companies can use several different methods, at times in combination, to measure their interest rate risk exposure and the impact it could have on the financial performance of the business: The simplest way of measuring interest rate risk is by using gap analysis. This method measures the gap between the volumes of interest-rate sensitive assets and liabilities that are repriced after specific time periods. First, repricing or maturity periods need to be established depending on the asset liability makeup of

the company. These periods are sometimes referred to as buckets. For example, a company could choose five buckets for the periods from months, months, months, months and 24 months. Assets and liabilities are distributed into the different buckets depending on the time when they are repriced when floating or according to their maturity when fixed. Then the cash flows for all assets and liabilities in each time period need to be determined. The net interest income or expense for each bucket constitutes the gap for each time period. Interest rate risk arises from net cash inflows or net cash outflows for a given time period. In order to eliminate the risk for this period, all future cash outflows would need to be offset by future cash inflows and vice versa. In practice, this is very unlikely as most companies have net debt. However, gap analysis can be used to determine the exposure to interest rate risk and identify hedging instruments that can be employed to manage the effects of potential interest rate changes. While gap analysis does not require any sophisticated technology, is easy to use and provides clear results, it has several disadvantages. One of these is that it assumes assets and liabilities reprice simultaneously within each bucket, and therefore ignores the mismatches and repricing risk within buckets. This means that shorter, more frequent time periods yield better results. However, a more practical difficulty with the gap analysis is that each gap has to be managed individually and the hedging of interest rate risk becomes more problematic the more gaps there are. Another important problem is that gap analysis cannot be applied to more complex instruments – such as options – as the size and the timing of cash flows relating to these instruments is difficult to establish. For these reasons, gap analysis is today less used by organisations with complex balance sheets, such as large companies and in particular by financial institutions. In less complicated scenarios, gap analysis provides sufficient interest rate risk measurement. An alternative method for measuring interest rate risk is duration analysis, which provides a solution to most of the problems related to the gap approach by discounting future cash flows to a present value. This method allows each individual obligation to be treated according to the time it has to maturity – its duration. Duration analysis enables the risk manager to gain a more accurate understanding of the interest rate risk the company faces by recognising the importance of the timing of cash flows. Duration incorporates the cash flows of different events, assets and liabilities for different time periods in a single analysis. In duration analysis, all future cash flows are identified for the time period when they are due. The cash flows are then discounted and aggregated to a present value in terms of amount and tenor. Where appropriate, these values are then combined to provide a net value at risk. Building on this concept of duration – also known as Macaulay duration – modified duration can be used to provide a measure of price sensitivity to interest rate changes. After having determined the duration of all assets and liabilities, modified duration helps to determine how a change in interest rates will affect the value of each asset and liability. The average duration of these individual items, weighted according to their proportion of total assets or total liabilities, can then express the effect a given interest rate change will have on the whole portfolio or net worth. While the analysis can be very accurate when cash flows and corresponding interest rates are easily identifiable, it becomes more difficult when estimates have to be used. Another problem with duration is that it has to assume that interest rates for all maturities are the same, which is not the case. This assumption will affect the present value of the risk to be hedged. Further, duration measures are only accurate for relatively small changes in interest rates, because duration assumes that there is a linear relationship between the price and yield of a financial instrument. This ignores the convexity of yield curves for larger interest rate changes and leads to inexact results when interest rates are very volatile. Scenario analysis is a more comprehensive method of measuring interest rate risk. It employs different scenarios modelling the most likely interest rate developments and their effects on the financial situation of the company. In its most basic form, a scenario analysis will simulate the events of interest rates rising, interest rates remaining unchanged and interest rates decreasing. The different scenarios will be modelled over the same time periods and project interest rate changes at certain intervals. A more complex scenario analysis could include a larger number of scenarios or more complicated interest rate developments like flattening, steepening or inverted yield curves. The scenario model will make assumptions about the correlation between risk variables ie interest rates and the development of individual assets and liabilities. The results of a scenario analysis can then be expressed in a number of ways including earnings, cash flow and economic value. Overall, scenario analysis is more flexible than gap and duration analyses in

that it can incorporate complex financial instruments and yield curve developments and it is not fixed to one point in time. However this type of analysis only deals with the risks that form part of the stylised model. In addition, the accuracy of the results will depend to a large extent on the validity of the assumptions made in the model. The potential for error grows with the complexity of the model and the more assumptions have to be included. Scenario analysis is also very dependent on IT infrastructure and the qualification of the personnel developing and using the models. Value at Risk VaR analyses provide a single measurement of risk faced by a company at a particular time. The VaR approach attempts to give an indication of the maximum loss that a company could face when market rates ie interest rates change adversely. The typical VaR statistic includes three elements – a time period, a confidence level and a loss amount or loss percentage. The VaR approach estimates the probability distribution of risk factors such as interest rate changes and their effects on the volatility of a portfolio of assets and liabilities. There are three methods of calculating VaR: This is the most straightforward method. Variance-covariance observes the movement of instruments over time and uses probability theory to compute the likely maximum loss. This is done by calculating the standard deviation volatility of an instrument and the correlation between individual asset price movements return within a portfolio. This method assumes a normal probability distribution of asset price volatility return and then calculates the maximum loss within the required probability. Variance-covariance is often regarded as too simplistic for more complex, exotic instruments. This analysis assumes that historical information will give a good indication of what is going to happen in the future and therefore does not take into account any unprecedented events. The historical method sorts actual historical asset price movements returns , illustrating them in a distribution from lowest to highest on a histogram. As it is based on company specific data generated from previous events, historical analysis does not need to make any assumptions about the probability distribution of asset price volatility. The VaR is simply read from a histogram. This involves the development of a model that would be able to incorporate more exotic instruments, for which companies often do not have sufficient data to employ the historical method. This method expresses the results in a histogram generated from a simulation of interest rate price changes and their effects on asset value volatility. A Monte Carlo simulation is typically the most complex, expensive and time consuming method. VaR gives the risk manager a single measure of the risk faced by a company over a specific period of time. It also allows for a number of different risks to be combined into one single measurement and takes account of different exposures offsetting each other. Next month Next month we will discuss how to manage interest rate risk with swaps.

Chapter 5 : Why You Should Not Ignore Interest Rate Risk | Investopedia

Interest Rate Risk Management. As a company issues debt, whether to support the acquisition or divestment of an asset, or as part of its M&A activity, it must decide how to manage the financial risk associated with interest rate movement.

Community bank profitability has been under pressure due to increases in nonaccrual loans, credit losses, other-than-temporary impairment OTTI charges, and loan workout expenses. To meet the challenge of generating positive earnings and more suitable returns for their stakeholders, many banks have lengthened asset maturities or increased assets with embedded optionality. These actions serve to increase interest rate risk exposures and, thus, the need for more robust risk management programs. The purpose of this article is to provide an overview of the current banking landscape and to discuss key interest rate risk management activities and concepts for community banks. More detailed discussions of specific interest rate risk management elements are planned for subsequent articles. The Current Landscape During the credit downturn, problem loan losses and accompanying provision expenses were the most significant contributors to net losses at community banks. Lying further beneath the surface of these net losses was significant contraction of net interest margins. By historical standards, interest rates across the maturity spectrum are low and have been for some time, as illustrated by the depiction of short- and long-term Treasury rates in Figure 2. Low interest rates, coupled with business contraction, have created an environment where bankers face difficult choices to maintain earnings performance. Some have elected to pursue new business lines that generate different sources of interest income or additional noninterest income, although these business lines may create new operational, credit, liquidity, and legal risks to those firms. This trend is illustrated by the increase in assets with maturities or repricing terms greater than three years as a percentage of total assets Figure 3. Those institutions extending asset maturities without a corresponding shift in liabilities are particularly exposed to significant upward movements in interest rates, which is not as uncommon as often perceived. In fact, the overnight federal funds rate experienced a change of basis points or more over a month period 15 percent of the time between and Common Interest Rate Risk Exposures Generally speaking, interest rate risk is the risk that an adverse outcome will result from changes in interest rates. While interest rate risk can arise from various sources, four key types of interest rate risk are common to community bank balance sheets: The risk that assets and liabilities reprice or mature at different times, causing margins between interest income and interest expense to narrow. The risk that changes in underlying index rates used to price assets and liabilities do not change in a correlated manner, causing margins to narrow. For example, loans priced off national prime rates might not change in the same manner as certificates of deposit priced off U. The risk that asset repayments accelerate at a time when interest rates are low, resulting in diminished interest income and the need to reinvest repaid funds in lower-yielding assets. The flip side of prepayment risk is extension risk, which stems from the lengthening of asset payoff rates in a rising rate environment, thereby reducing the funds available to invest at higher yields. The risk that nonparallel changes in the yield curve will disproportionately affect asset values or cash flows. For example, mortgage assets tend to be priced off year U. Suppose year Treasury rates change significantly, while all other Treasury rates remain unchanged. The value and cash flows from mortgage loans and mortgage-related securities will also change significantly, but other assets and liabilities will not experience similar changes. Thus, banks with significant mortgage asset holdings would be exposed to greater yield curve risk than those with mortgage assets comprising a lower percentage of assets. Key Risk Management Elements Because banks are in the business of transforming short-term deposits into longer-term loans, they are inherently exposed to some degree of interest rate risk. The rigor and expense applied to these programs should be commensurate with the size of the risk exposures and complexity of activities and holdings. Therefore, while there are elements of interest rate risk management that all banks should have in place, community banks would not necessarily need the same level of sophistication in their risk management practices as those that are in use at larger, more complex banking organizations. When bank examiners evaluate interest rate risk policies, these are the key components considered. Perhaps the most significant

component of a sound interest rate risk policy is the establishment of appropriate risk limits. Risk limits convey to staff how much exposure is acceptable before remedial actions should be taken to address an excessive risk position. Moreover, risk limits should reflect manageable constraints that are not excessively broad so that they provide a meaningful control. For any risk limit to be useful, it must be understood by management and the board; be capable of being measured with existing risk measurement tools; and be stated relative to meaningful values, such as earnings or capital. For example, effective earnings exposure limits will communicate to bank personnel the maximum percentage of earnings either net interest income or net income that the board is willing to put at risk in certain interest rate shock scenarios e. Earnings and capital limits will allow management and the board to effectively determine whether earnings are adequate to sustain short-term earnings exposures and whether sufficient capital is in place to cover long-term risk exposures. Risk Measurement and Reporting Perhaps the most discussed interest rate risk management topic for community banks is risk measurement. Questions often arise regarding the types of tools or models that are needed, how to fine-tune those tools, and how often measurement reports should be provided to the ALCO and the board. Measurement techniques typically fall into two broad categories: Short-term measurement techniques should quantify the potential reduction in earnings that might result from changing interest rates over a to month horizon. Examples of increased complexity include elevated levels of assets with embedded options, increased mortgage banking activities, or the use of financial derivatives. Once management and the board have determined the appropriate measurement tools for evaluating interest rate risk exposures, a decision must be made regarding reporting frequency. Banks with low interest rate risk profiles typically provide risk measurement reports to the ALCO and the board at least quarterly. It is not uncommon for community banks with moderate and high risk exposures to provide monthly reports to the ALCO and quarterly reports to the full board of directors. Regardless of reporting frequency, sufficient information should be provided to allow decision-makers to evaluate the sources of exposures and identify potential noncompliance with risk limits. It is important to document policy exceptions and resulting action plans in board and ALCO minutes. Internal Controls and Audit The interagency advisory and subsequent FAQs attempt to bring greater clarity to regulatory expectations about internal controls and audit requirements. Examiners have long expected all banks to maintain appropriate controls over risk measurement and reporting processes. Generally speaking, these controls include secondary reviews of data accuracy in risk measurement tools, reporting of compliance with policy limits, and periodic review and documentation of the reasonableness of assumptions used in risk measurement tools. As community banks have increased their use of interest rate risk models, examiners have expected management teams to take greater steps to ensure that data, assumptions, and output are reasonable and accurate. At a minimum, an independent review of data inputs, key assumptions, 6 the accuracy of ALCO and board reports, and policy compliance should be conducted annually. An independent review does not necessarily need to be conducted by a consultant or external party, but the reviewer must be independent of interest rate risk management activities and have sufficient understanding of accounting, modeling, and risk management requirements to be competent to complete the review. For community banks with increasing balance-sheet complexity or scope of activities, adequate independence and competency often require contracting with an outside party. As with any type of independent review or audit, results should be reported to the board, and action plans should be developed to address identified weaknesses. Common Pitfalls One of the unique opportunities examiners have is to observe both best practices and common weaknesses at a broad cross-section of banks. At community banks, three common deficiencies in interest rate risk management tend to recur and are often cited in examination reports as matters requiring board attention. First, many examiners have reported that they often find gaps between board-prescribed risk limits and the risk measurement tools used to quantify risk exposures. While not every risk measure captured by the measurement tool requires a risk limit, the risk limits established by the board should be routinely calculated and reported. While certain vendor-provided assumptions may be appropriate for some banks, the management team should evaluate the reasonableness of those assumptions before accepting them for use in a given model. Third, many banks have not incorporated independent or third-party reviews to ensure the integrity of their interest rate risk management programs. Since , this has been perhaps the most prevalent interest rate risk matter identified by

examiners, as community bank management teams work to comply with the guidance set forth in the interagency advisory. Conclusion Community banks face a number of formidable challenges in the current economic environment. However, with appropriate interest rate risk management programs, the inherent interest rate risks that are intrinsic to banking can be managed effectively for given levels of capital and earnings. Net interest income or net income results from these calculations are then compared to a base case no rate change scenario to determine how much income exposure exists with each interest rate change scenario. These cash flows are discounted to arrive at present values of bank equity, and these present values are compared with discounted economic values of bank equity for a zero interest rate change scenario to express the risk exposure as a percent change in EVE. Price sensitivities refer to the percent change for asset or liability pricing for a basis-point change in the underlying interest rate r . Also In This Issue.

Chapter 6 : Interest Rate Risk Management from Citizens Commercial Banking

Interest Rate Risk Management at Community Banks by Doug Gray, Managing Examiner, Federal Reserve Bank of Kansas City. Over the past few years, the banking industry has faced significant earnings challenges.

A standard interest rate swap is a contract between two parties to exchange a stream of cash flows according to pre-set terms. In essence, the transaction involves trading costs associated with two different types of loans—typically swapping the terms of a floating rate loan for those of a fixed rate loan or vice versa. Borrowers may have specific objectives when choosing to participate in an interest rate swap or related hedging strategy. For example, the goal may be to reduce interest expense on a particular loan by swapping a higher fixed rate for a lower floating rate. Alternatively, a borrower may wish to hedge existing interest rate risk related to the potential that rates will move higher in the future. This is accomplished by swapping the terms of an existing variable rate loan for those of a fixed rate loan that will lock in the interest rate on a loan for the loan duration. An important distinction of an interest rate swap compared to other types of financial transactions is that principal is never exchanged. The swap represents an agreement to exchange interest cash flows over time. Interest rate swaps are completely customizable with flexible terms. The contract is legally separate from the hedged item, and no upfront premium is required to execute a swap. This paper provides an overview of the workings of interest rate swaps and related strategies that individuals or entities may want to consider to help manage interest rate risk. This includes a discussion of how the interest rate environment may affect any decisions made about swaps or related hedging strategies. Fundamental interest rate considerations

Interest rate swaps typically involve trading of a variable rate loan structure for one with a fixed rate or vice versa. Before considering the viability of pursuing an interest rate swap, it is important to understand some underlying fundamentals about loans and how they may influence a swap strategy. Loans can typically be structured either with a floating rate or a fixed interest rate. Each comes with its own advantages and disadvantages. These are factors that need to be considered not only when first obtaining a loan, but also when considering whether to swap a loan for one with different terms. Another consideration is the current state of the interest rate market. While the future direction of interest rates is not predictable, historical trends can provide some guidance on potential future trends. This may impact a hedging strategy. Why consider an interest rate swap? There are a variety of reasons that an interest rate swap might be considered: To lock in a fixed interest rate, taking advantage of a favorable environment and removing interest rate risk as a consideration. To reduce current interest expense by swapping for a floating rate that is lower than the fixed rate currently being paid without having to refinance a loan and pay the associated costs. To more effectively match interest rate sensitive assets and liabilities. To better diversify financial risks in a loan portfolio by converting a loan portfolio from all fixed or all variable to a mix of the two. To change the interest rate composition of a current loan without facing the expense associated with refunding or issuing new debt.

Mechanics of an interest rate swap An interest rate swap represents a derivative product. When two parties agree to an interest rate swap, they are trading interest rate arrangements. In a typical case, a borrower that currently carries a loan with a variable interest rate arranges with a counterparty such as U. Bank to swap loan terms, exchanging the variable rate for a fixed rate. The borrower will pay a fixed rate plus any spread that is applied to the proxy used to determine the variable rate. In return, the counterparty provides payment of the lending rate not including any spread, so that portion of interest is, in essence, canceled out for the borrower. The exchange includes only interest cash flows over time, with no principal involved. Each party is simply swapping its existing obligation for the desired obligation. The fixed rate is based on an average of expected future floating rates. Its variable rate loan is priced at 2. It comes to an agreement to pay an additional 1. In effect, the business agrees to pay interest on its loan at a rate of 3. The variable rate loan minus the spread currently at 0. The borrower is no longer at risk for changes in the variable rate loan. There is no exchange of principal amounts. Other terms that drive the mechanics of the transaction include: The notional amount of the principal not the principal itself The effective date, termination date and payment dates of the loan

Additional hedging strategies for borrowers A straightforward swap of one interest rate for another is only one strategy

that can be pursued. Depending on circumstances, other approaches may be more appropriate. Here are examples of different strategies that can be considered:

Partial Hedge Blended Rate strategy This allows a borrower to use a combination of fixed rate and variable rate loans in order to manage interest rate risk. Another option is to use a mixed approach, hedging variable rates by locking in a fixed rate for a portion of the loan. This allows the borrower to experience a blended rate that is lower than the fixed rate, reducing interest expense for the period of the loan. If at some point the borrower chooses to swap the variable portion of the loan, this can be done with less cost than would be the case if the entire loan were based on a variable rate. Depending on the interest rate environment, the borrower may realize significant savings by using this blended strategy.

Blend and extend strategy An offshoot of the blended rate strategy is to consider refinancing a fixed rate loan before the term of that loan matures. Terms of commercial loans are often for a limited number of years. At the time the loan matures, the borrower has to either refinance or pay off the loan balance. If the interest rate environment is favorable before the loan matures but the risk of higher rates by the time the term ends is high, it may be beneficial to refinance the loan prior to maturity of the term. Even if a swap prepayment penalty is due by refinancing early, the penalty could be blended into the new rate. This could generate important savings by eliminating the risk of paying higher interest expenses in the future and the need to pay an upfront fee.

Interest rate cap strategy Borrowers who are interested in taking advantage of low rates sometimes hesitate to seek a loan due to the risk that rates will rise down the road. Interest expense may be the difference in determining whether an investment that must be financed will ultimately be profitable for the borrower. To help eliminate interest rate uncertainty, using a variable rate structure, terms can be arranged for an additional premium that allow for the borrower to set a maximum interest rate ceiling. The applicable interest rate, which will fluctuate, is capped. Even if rates exceed the ceiling, the borrower would not pay interest charges higher than the ceiling. This can eliminate the potential of higher interest expense in the future while still retaining the possibility for lower interest expense when interest rates remain low.

Forward Rate Lock Using this strategy, a borrower can arrange a series of loans over a number of years and lock in a pre-determined interest rate. The rate will be higher than the current market rate, but it may be an appropriate way to hedge against a significant increase in rates occurring down the road.

Assessing the interest rate environment Any swap or hedging strategy needs to take into account the outlook for interest rates. At the same time, it is important to note that interest rate trends are inherently unpredictable. Historic trends show that rates can rise or fall quickly in certain environments. When such dramatic changes occur, borrowers can be caught by surprise. Hedging positions to prepare for potential changes in interest rates can be an effective strategy. Borrowers need to consider the current state of the interest rate environment as they determine a suitable strategy for their loan portfolio. In recent years, interest rates have hovered near historically low levels. This has created favorable conditions for borrowers regardless of whether they chose fixed rate or variable rate loans. The extended period of low rates made variable rate borrowing particularly attractive. This environment will likely not continue indefinitely. One lesson from the past is that a dramatic rise in interest rates can occur over a short period of time. There are numerous examples. Between December 2007 and December 2008, the Fed Funds² effective rate rose from 4. The Fed Funds rate stood below 8 percent in June 2009 and by the end of that year had risen to 7. From June 2009 to December 2009, the Fed Funds rate jumped from 7. More recently, from June 2010 to September 2010, the rate increased from 0. All provide examples that interest rate spikes can happen in short order, and often without much notice.

Change in Fed funds rate Source: Shaded areas indicate U. This is one way to secure still low interest rates. In circumstances when interest rates are at higher levels, borrowers may want to consider swapping their fixed rate loans at higher rates for variable rate loans, seeking to take advantage of the potential for an improving interest rate environment. Keep in mind, however, that future interest rate trends are difficult to predict. Suitability for interest rate swaps and hedging strategies

Changes in suitability requirements have been implemented for interest rate swaps as part of the Dodd-Frank Wall Street Reform and Consumer Protection Act of 2010, for example, net worth requirements must be met in order to participate in the type of transactions discussed in this paper. A financial professional can provide more details about suitability requirements to participate in interest rate swaps or related strategies.

Risks associated with derivatives transactions It is important to be aware of risks that are inherent in any transactions related to

interest rate swaps and related hedging strategies. Opportunity Costs – locking in a fixed rate may result in higher interest expense than the average of the floating rate over the same period. Potential Mark-to-Market Make-Whole – if the swap is unwound prior to maturity and interest rates have declined, the borrower may be subject to a termination cost. It does not create any commitment to lend or act as a source of funding. It represents a hedge of changes in a variable rate index only, not a hedge of the actual credit pricing on the underlying loan. Basis Risk – it is possible that changes in the variable rate index used in the derivative contract do not perfectly mirror changes in the variable rates used to set the pricing on the underlying loan. Settlement – a risk exists that the counterparty will fail to make required payments. Conclusion The need to effectively manage interest expense is an important part of any borrowing plan. The goal may be to limit interest expense or to gain a degree of certainty about the extent of future interest payments. Managing a loan portfolio can be challenging given the inherent unpredictability of interest rate trends.

Chapter 7 : Interest Rate Risk Management at Community Banks - Community Banking Connections

Interest Rate Risk Management Version September monthly based on the one-month London Interbank Offered Rate (LIBOR), exposes the institution to the risk that the spread between the two index rates may change.

Chapter 8 : The Fed - Supervisory Policy and Guidance Topics - Market Risk Management

Interest Rate Risk Management The expertise you need for an effective hedging strategy. With SunTrust, you'll benefit from decades of derivative structuring and execution experience.

Chapter 9 : Conflict of Interest Risk Management for Your Project | World Bank Group

Interest rate risk is the risk that arises for bond owners from fluctuating interest rates. The more interest rate risk a bond has depends on how sensitive its price is to interest rate changes in the market.