

Investment Portfolio Management



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Investment Portfolio Management

Introduction

Sections 11(g), 11(h), and 16(a) of the FHLBank Act, Section 956 of the Finance Board regulations, and the Finance Board Financial Management Policy (FMP) establish the FHLBanks' investment authority. The entire FMP applies only to FHLBanks that have not yet converted to their new capital plans. Each FHLBank that has converted to its new capital plan has established its own Finance Board-approved risk management policy (RMP). Only the provisions of the FMP contained in Sections II.C.2., 3., 4., and 5., and Section V.C.5. apply to such FHLBanks. The FMP provides a framework within which the FHLBanks are allowed to implement financial management strategies that assist them in accomplishing their mission, and in generating income sufficient to meet their financial obligations in a safe, sound, and profitable manner.

Regulatory Environment

1) Rules and Regulations of the Federal Housing Finance Board, which include the following parts and sections relevant to investment portfolio management:

Part 917 of the Finance Board regulations addresses powers and responsibilities of FHLBank boards of directors and senior management. In particular, Section 917.3, Risk Management and Section 917.6, Internal Control System, are pertinent.

Section 932.9 of the Finance Board regulations addresses unsecured extensions of credit and limits to various counterparties. It also details measurement and reporting requirements for both on- and off-balance sheet exposures.

Section 940.3 of the Finance Board regulations discusses allowable mission-related investments.

Part 956 of the Finance Board regulations discusses allowable and prohibited investments.

2) Advisory Bulletins of the Federal Housing Finance Board that provide supervisory guidance relating to the topic of investment portfolio management are:

Advisory Bulletin 98-10, dated December 8, 1998, which formalizes guidance to the FHLBanks on the minimum unsecured credit monitoring standards the FHLBanks are expected to apply.

Advisory Bulletin 01-08, dated October 4, 2001, which establishes policy and procedures standards for identifying, comparing, reporting, and quantifying problem assets.

Advisory Bulletin 01-09, dated October 24, 2001, which reinforces the need for the

FHLBanks to monitor unsecured credit positions, especially with respect to concentrations.

Advisory Bulletin 02-07, dated August 27, 2002, which establishes reporting standards for unsecured credit exposures.

Advisory Bulletin 05-08, dated August 25, 2005, which establishes regulatory expectations related to anti-predatory lending policies. This bulletin is pertinent to some private label mortgage-backed securities (MBS) investments.

Advisory Bulletin 07-01, dated April 12, 2007, which establishes regulatory expectations for the FHLBanks to adopt and implement policies and risk management practices that establish appropriate risk limits for, and appropriate mitigation of, credit exposure on nontraditional and subprime mortgage loans.

3) *Financial Management Plan*

Sections II.C.2., 3., 4. and 5. of the FMP establish the following limitations on authorized investments:

- 1) An FHLBank may enter into agreements to purchase MBS, collateralized mortgage obligations (CMOs), real estate mortgage investment conduits (REMICs), and eligible asset-backed securities so long as such purchases will not cause the aggregate book value of such securities held by the FHLBank to exceed 300 percent of the FHLBank's capital. An FHLBank may not increase its holdings of such securities in any one calendar quarter by more than 50 percent of its total capital at the beginning of that quarter.
- 2) The purchase of Interest Only or Principal Only stripped MBS, CMOs, REMICs, and eligible asset-backed securities are prohibited.
- 3) The purchase of residual interest or interest accrual classes of CMOs, REMICs, and eligible asset-backed securities is prohibited.
- 4) The purchase of fixed-rate MBS, CMOs, REMICs, and eligible asset-backed securities, or floating-rate MBS, CMOs, REMICs, and eligible asset-backed securities that on the trade date are at rates equal to their contractual cap, with average lives that vary more than six years under an assumed instantaneous interest rate change of 300 basis points, is prohibited.

FHLBank Environment

Given the regulatory environment within which the FHLBanks operate, their investment portfolios tend to be of higher credit quality and driven by mission-related activities. The investment portfolios are normally divided between the money market portfolio and the term portfolio. The money market portfolio contains primarily short-term, highly-rated unsecured investments. These investments include the following: Federal funds sold, certificates of deposit, commercial paper, repurchase agreements, and short-term U.S. Treasury (Treasury or Treasuries) and Agency obligations. This portfolio is very liquid and comparatively low- yielding. The portfolio is

used primarily to meet regulatory liquidity requirements and funds management needs. Management of the money market portfolio is normally a separate function under the FHLBanks' treasury function. These portfolios are transaction-intensive and require continual monitoring for credit events but have negligible interest rate risk.

The term portfolio is composed of GSE MBS, private label MBS and commercial MBS, state housing authority debentures, and longer-term Treasuries. These investments are also highly-rated, although the drivers for the high ratings can be different than those for the money market portfolio. In particular, the amount of collateral rather than quality of collateral for private label MBS and CMBS drives the ratings. This portfolio is liquid and comparatively higher-yielding. The portfolio is used primarily to generate earnings, but can also be used for other purposes, normally within a broad balance sheet management content. Management of the term portfolio is normally a separate function under the FHLBanks' treasury function. These portfolios require regular monitoring for performance and do contain interest rate risk.

Risks Associated with Investment Securities

An FHLBank's primary risks associated with investment securities and money market assets are set forth below.

1) Lack of Sound Corporate Governance (Board of Directors and Senior Management Oversight)

- a) Key risks and controls are not adequately identified, measured, monitored, and controlled.
- b) A sound risk management framework composed of policies and procedures, risk measurement and reporting systems, and independent oversight and control processes has not been developed and implemented.
- c) Senior management has not adequately analyzed new products or activities, taking into account pricing, processing, accounting, legal, risk measurement, audit, and technology considerations.
- d) Risk management, monitoring, and control functions are not sufficiently independent of the position-taking functions.
- e) Duties, responsibilities, and staff expertise, including segregation of operational and control functions, are not adequately defined.
- f) Independent audit coverage and testing is limited; auditors are inexperienced or lack the technical expertise to test the control environment.

2) Market Risk

The discussion of market risk will begin with those factors that impact the price sensitivity of a security and then proceed to outline measures of rate sensitivity, both for option-free securities and securities with options. Finally, this section will address portfolio sensitivity measures, risk control of portfolio sensitivity, and asset/liability management issues.

Factors in Interest Rate Sensitivity

The investment portfolio, which often contains longer-term, fixed-rate assets, is usually a significant source of interest rate risk for an FHLBank. From an interest rate risk standpoint, "sensitivity" refers

to how much the price of a security changes when interest rates change. Regardless of the type of security, it is the variability of the value of the security's cash flow, caused by fluctuating interest rates and spreads relative to a benchmark such as Treasuries, that determines a security's price sensitivity. A security's interest rate, or price sensitivity, is primarily a function of:

- 1) Maturity;
- 2) Option features;
- 3) Coupon rate; and
- 4) Yield levels.

Maturity. For most securities, maturity is the most important determinant of price sensitivity. If a change in interest rates is the same across all maturities, a "parallel" interest rate shift, the price of a long-term security will change more than the price of a short-term one. For example, if interest rates rise 100 basis points, a 30-year, 5 percent coupon Treasury bond would lose nearly 14 percent of its value, while a two-year, 5 percent coupon Treasury note would lose less than 2 percent. Because money market assets mature within one year, they generally have the least price sensitivity.

Option features. Options can either increase or decrease a security's potential for price changes, depending upon the type of option and who owns it. A call option allows the issuer of the security to redeem the full amount of the obligation before its maturity date. Investors have sold, or are "short," the option on a callable bond. In return for allowing the issuer to call a bond prior to maturity, investors receive a higher yield.

It is helpful to consider securities with call options in two groups: amortizing and non-amortizing or "bullet" securities. An amortizing security is one that pays principal throughout its life, such as a mortgage security. A non-amortizing security is one that has only one principal payment. That payment may occur before maturity, and may exceed par value due to a call premium (for example, callable at a dollar price of 102 percent of par), but it does not pay principal throughout its life. Amortizing securities typically experience "partial calls" because, for example, some but not all borrowers may prepay their mortgages.

For a non-amortizing security, the call option limits price when rates fall. Investors are not willing to pay large premiums if the issuer can redeem the bonds prior to maturity. Many callable securities remain callable past the initial call date. For example, the issuer of a five-year bond callable in two years, often referred to as "five, non-call two", may typically call the bond at the end of two years, or on any coupon payment date thereafter, if the option is Bermudan. Investors need to understand all possible dates that issuers can call their bonds since the call dates will have a direct bearing on the price sensitivity of the security. These call options typically require the issuer to call the entire security.

If interest rates rise, however, the price sensitivity of non-amortizing callable bonds will ultimately approach the sensitivity of non-callable securities with the same final maturity. For example, the five, non-call two bond above initially will have the price sensitivity of a bond with a two-year final maturity. However, if interest rates continue to rise, the bond will eventually begin to depreciate like other securities with the same final maturity. Therefore, callable securities can lose value at an increasing rate as the security's effective maturity becomes longer.

Amortizing securities, such as mortgage securities, have similar performance characteristics. A mortgage borrower has the right to pay off, or “call,” the debt before maturity. The mortgage lender therefore has sold a call option to the borrower. Since mortgage securities pass through cash flow from the underlying mortgage loans to investors, investors in mortgage securities have effectively sold call options to borrowers. The homeowners have the economic incentive to exercise these options and prepay when interest rates have fallen, allowing them to refinance and get new mortgages at lower interest rates. The prepayment option limits price appreciation for mortgage securities when interest rates fall.

When interest rates rise, amortizing securities may also lose value at an increasing rate, as their average lives extend. For example, a mortgage security may, at current interest rates, have an estimated average life of five years. Average life refers to the average length of time a dollar of principal remains outstanding. However, as rates rise and fewer homeowners prepay, the security may then have an average life of seven years. Its price sensitivity will consequently become similar to a seven-year security, rather than a five-year security.

It is helpful to consider amortizing securities into two separate groups: pass-through and pay-through or “structured” securities. In a pass-through security, investors get their pro rata share of principal and interest payments. If an investor owns 1% of the security’s par value, it will receive 1% of the cash flow. The cash flow from the underlying mortgages “passes through” to investors.

In a pay-through, or “structured” security, a set of payment “rules” determines how and when investors receive principal cash flows from the underlying mortgages. For structured securities like CMOs, the “maturity effect”, where the security loses value at an increasing rate, can be very significant. A lower-risk CMO tranche will have limited cash flow variability as rates change. A higher-risk CMO tranche will have significant cash flow variability as rates change.

The following table illustrates how the average life of two different CMO structures might change as rates change by 200 basis points.

Structure	Average Life: Unchanged Rates	Average Life: Rates Up 200 bps	Average Life: Rates Down 200 bps
Lower Risk	2.0 yrs	3.2 yrs	1.7 yrs
Higher Risk	2.0 yrs	19.7 yrs	0.2 yrs

A higher-risk CMO tranche could, for example, have an average life that changes from 2 years to 20 years with even a modest increase in interest rates. Higher risk refers here to the cash flow variability of the tranche, not its credit quality, although underwriters can create structured securities that combine higher average life sensitivity with lower credit quality.

The highest yields go to those tranches that, by design, exhibit the most volatile average lives. Such tranches receive excess principal cash when prepayments rise, and pay off early. When prepayments are slower, these tranches may not receive any principal cash flow at all. Such tranches protect or “support” other tranches in the CMO structure. These other, well-supported, tranches may have lower risk than the pass-through security from which they are created. Although there are partial calls in the underlying mortgages that make up the CMO, the payment rules of some CMO tranches

can result in a complete call of the tranche as rates fall, making it similar to a non-amortizing security.

The risk-return profile of callable (non-amortizing) and prepayable (amortizing) securities is therefore not symmetrical. Investors in these securities have limited upside price potential. Investors are not willing to pay large premium prices for assets that can be called. Investors use the term “price compression” to refer to the inability of such securities to trade at prices significantly above par. However, these securities can have significant downside price potential. To compensate investors for this asymmetric and unfavorable risk profile, callable and prepayable securities must offer higher yields. The following table summarizes callable and prepayable securities:

Type	Cash Flow Priority	Sensitivity
Callable	Not applicable.	Limited price upside; can depreciate at an increasing rate when interest rates rise as effective maturity lengthens.
Amortizing: pass-through	Pro-rata. Examples: GNMA, FNMA & FHLMC mortgage pools.	Limited price upside; can depreciate at an increasing rate as effective maturity lengthens.
Amortizing: structured	Determined by payment rules. Examples: CMO tranches.	Depends upon security structure. Some tranches can have very high price

and cash flow risk and others
very low price and cash flow
risk.

A put option allows the investor to return the bond, at a price of par, to the issuer prior to its stated maturity. Here, the investor owns the option. Investors will exercise this right when interest rates have risen, since they can reinvest the proceeds at higher available market yields. The put option thus limits price declines when rates rise, because the investor can redeem the bond at par on a specified date. When interest rates fall, however, the price of the security will rise like a bond without option features. Put bonds thus have very favorable risk-return profiles, and investors must accept lower yields for this favorable asymmetry.

Coupon rate: The coupon rate of a security also affects its price sensitivity. There is an inverse relationship between coupon and price sensitivity. Higher coupon securities have lower price sensitivity; lower coupon securities have higher price sensitivity. A security whose coupon rate exceeds the required market yield for a particular maturity is a “premium” security because its price exceeds par value. For example, a security with a coupon rate of 5.75 percent will have a price over par value if the security’s yield in the market is 5.50 percent. A security whose coupon rate is below the required market yield is a “discount” security because its price is less than par value. The security with the 5.75 percent coupon trades at a discount when the required market yield is 6.25 percent. Discount securities have more price sensitivity than premium securities. The most discounted of all

securities is a zero coupon bond. A zero coupon bond is a security that investors purchase at a discount and redeem for par value at maturity. It has no coupon cash flows. Its only cash flow is the return of par value at maturity. For any given maturity, a zero coupon bond will have the most price sensitivity.

The inverse relationship between coupon rate and price sensitivity results from the distribution of cash flows. Compared to a lower coupon bond, more of the total cash flow of a high coupon security will come from interest payments. Interest payments are received throughout the life of the bond, which means that, relative to a lower coupon bond, a higher coupon bond will have a higher proportion of its cash flow returned sooner. The earlier the cash flow occurs, the less price sensitive its cash flow is.

As discussed above, longer maturity cash flows pose more risk than shorter maturity ones. Since a zero coupon bond has only one cash flow, a par value redemption at maturity, it will have the most price sensitivity of bonds with the same maturity.

Yield Levels: Non-callable bonds have more price sensitivity when market yields are low than when market yields are high, because of the curved or “convex” nature of the relationship between price and yield. This relationship means that non-callable bonds rise in value at an increasing rate when interest rates fall; they decline in value at a decreasing rate when interest rates rise.

The following table summarizes the factors other than credit that affect the price sensitivity of investment assets:

Factor	Higher Sensitivity	Lower Sensitivity
Maturity	Long maturities	Short maturities
Options	Sale of call options: limited upside price gains; full downside price exposure	Purchased puts: limited downside price losses; full upside price potential
Coupon	Lower coupons	Higher coupons
Yield Levels	Low yields	High yields

Floating-Rate Securities

Investors often mistakenly assume that floating-rate securities have little price sensitivity risk. Features that can cause floating-rate securities to have higher price sensitivity include option features, long maturities, and credit risk.

Consider a security that has a coupon rate that floats off of the London Interbank Offered Rate (LIBOR). Such a security might pay a coupon rate of Libor plus 50 basis points. However, if there is a cap that limits the coupon to 7 percent, then when LIBOR reaches 6.50 percent, any further increases in LIBOR will not result in any increases in the coupon rate on the security. Floating-rate investments with interest rate caps include CMO floaters and adjustable-rate mortgage (ARM) securities. The longer cash flows remain outstanding on such securities, the greater their potential price decline, since the investor faces a longer period of having the coupon capped at a below-market

rate. If a CMO floater's average life increases from 3 years to 15 years due to a rise in rates and anticipated slowdown in prepayments, the investment is likely to fall in value quite sharply. This explains why CMO floaters with high variability in their average lives offer greater spreads over LIBOR than floaters with lower average life variability. ARM securities have both periodic and lifetime caps.

Floating-rate assets do not need caps to have high price sensitivity. Consider an investment with a coupon rate of LIBOR plus 50 basis points, issued at a time when investors demanded a spread of 50 basis points over LIBOR. Such a security will be issued at par. However, if at some future date, investors demand a 150 basis point spread higher spread over LIBOR, then the security is 100 basis points "below the market" and will have to trade at a discount. The longer its maturity, the more depreciation it will have. The decline in market value is the same for the following 2 scenarios:

- 1) An investor buys a fixed-rate security yielding 5 percent and market yields increase to 6 percent; and
- 2) An investor buys a floating-rate asset with a spread over LIBOR required by the market changes from 50 basis points to 150 basis points.

The investor has lost 100 basis points in each case. The required market yield for each is now 100 basis points higher.

Inverse floating-rate securities are a special kind of floater. Their coupon rates increase when general market rates decrease. For example, the coupon may be 8 percent minus the three-month LIBOR. These securities often appeal to investors when the yield curve is very steep, as the coupon formula will give a coupon rate often well above short term financing costs. However, an increase in LIBOR can cause the interest rate on this type of security to drop very low and possibly to zero. If the security has a long maturity, it can lose significant value. As a result, FHLBanks should exercise great caution with such securities.

Some floating-rate securities have traded with prices 30 percent and more below par value, even without credit problems, because of structural risks such as interest rate caps and highly variable cash flows. FHLBanks should therefore fully understand the price sensitivity imposed by the security structure, maturity, option features and credit risk of these floating rate securities or "floaters."

Portfolio Sensitivity Measures

As a matter of sound investment practice, FHLBanks should be able to measure the price sensitivity for individual securities and for the entire portfolio. In general, techniques used to measure the risk of individual securities are also appropriate for the entire portfolio.

To estimate portfolio sensitivity, FHLBanks generally use, at a minimum, duration. Because of the presence of options in most portfolios, duration may not be an effective risk measure. Because of negative convexity, due to the existence of options in the portfolio, a portfolio may gain 2 percent when rates fall 100 basis points and lose 3 percent when rates rise 100 basis points. Given the growing importance of economic value measurements for interest rate risk, it is important to recognize these asymmetries. FHLBanks should therefore evaluate portfolios in both rising and falling rate scenarios.

A security stress test involves evaluating the price sensitivity of a security, or a portfolio, over a number of different interest rate changes. To identify and measure portfolio risk, maintain duration of equity limits, and adhere to sound investment practices, FHLBanks are required to estimate the value of their investment portfolios for different parallel interest rate changes. However, since parallel shifts rarely occur, FHLBanks should, in general, also measure portfolio value changes for non-parallel shifts, such as yield curve steepening and flattening scenarios. A steepening yield curve occurs when the yield spread between short maturity yields and long maturity yields increases. For example, if the difference in yields, or “yield spread,” between 2- year and 10-year Treasury securities changes from 100 basis points to 150 basis points, the yield curve has steepened. A yield curve flattening occurs when the yield spread between short maturity yields and long maturity yields decreases.

A more sophisticated technique to measure portfolio risk is value-at-risk (VaR). Whereas a portfolio sensitivity analysis measures portfolio value changes for a specific interest rate change for all securities, VaR measures the maximum potential loss on a portfolio for a specified confidence level and a specified time period. For example, consider a portfolio manager who measures VaR at a 95 percent confidence level and for a 90-day time horizon. If the portfolio’s VaR is \$8 million, there is only a 5 percent chance that at the end of 90 days the portfolio will have decreased in value by more than \$8 million. A VaR system, like any measurement system, contains many assumptions that a user must understand before reaching definitive conclusions for risk assessment purposes. Nevertheless, VaR can be an effective means of measuring and controlling portfolio risk. Many vendor models now calculate VaR, and all FHLBanks use at least one model that measures VaR for investment portfolio assets, as required under Part 932 of the Finance Board regulations.

Risk Control: Portfolio Sensitivity Limits

The investment portfolio typically has a significant impact on an FHLBank’s total interest rate risk profile. While FHLBanks may manage the interest rate risk of its mortgage assets by combining AMA and MBS, and manage the economic value risk of the entire FHLBank through VaR metrics, it is nonetheless a sound practice to separately measure and control price sensitivity in the investment portfolio with limits for price changes given rate changes.

For example, the FHLBank may limit the portfolio’s sensitivity to 10 percent when interest rates change 300 basis points. If a FHLBank has a portfolio with a current value of \$20 billion, the FHLBank will manage the risks so that the portfolio will not lose more than \$2 billion in value when rates change 300 basis points (\$20 billion x 10% = \$2 billion). FHLBanks may also establish portfolio sensitivity limits as some specified percentage of capital.

To supervise investment portfolio risks effectively, management may wish to periodically estimate, and report to the board of directors, the value of the portfolio in different interest rate environments. The value in each interest rate scenario, compared with the current portfolio value, illustrates the amount of portfolio price sensitivity. Sensitivity reporting is a convenient means of assuring that management has complied with the board of directors’ limits on the portfolio’s volatility.

The presence of a few securities with high risk may, or may not, be a supervisory concern. Whether a security is an appropriate investment depends upon such factors as the FHLBank’s capital level, the security’s impact on the aggregate risk of the portfolio, and management’s ability to understand and

measure the security's inherent interest rate risk and potential effects upon liquidity. Examiners, as well as FHLBank management, should assess the process and environment that led to the acquisition of such higher risk securities. For example, was the transaction a policy exception? Did some internal control process break down? Has management reported the securities properly on activity reports to the board of directors? Has the FHLBank's risk appetite changed? Answers to these questions, which may suggest a problem in the FHLBank's risk management process, could result in greater concern than the existence of a few higher-risk securities.

From a risk management perspective, the sensitivity of the entire portfolio is more important than the sensitivity of individual securities. A portfolio "sensitivity analysis" is a very effective way for management to gain an understanding of portfolio risks. The analysis can facilitate asset/liability management decisions and the establishment of policies or guidelines to control aggregate portfolio interest rate risk.

Asset/Liability Management Issues

The emergence of the derivatives market has led to the creation of investment securities with complex cash flow profiles. Investment professionals, using derivatives, can customize a security's structure to the investor's risk/reward profile of choice. As a result, investors now have more investment choices. The increasing complexity of many of the securities, however, has complicated asset/liability risk measurement and management decisions.

A decline in interest rates can cause significant amounts of prepayments and early redemptions for FHLBanks holding a large percentage of their portfolio in securities with options. The yields of such FHLBanks' portfolios could fall significantly as high-yielding assets pay off and are reinvested in lower market yields. These FHLBanks could be forced to reinvest substantial amounts of funds at a low point in the yield cycle. In an attempt to replace the high yields lost, management may be tempted to reinvest in additional securities with even more options. This strategy carries significant risks, since a subsequent rise in interest rates could extend maturities and accelerate depreciation. Management should consider guidelines on the volume of investments it can acquire within a short time period, in order to reduce the possibility of locking in a disproportionately large segment of the portfolio at the low point in the yield cycle.

If an FHLBank focuses exclusively on purchasing securities with the highest yields, the cash flow volatility of many of these securities will depress economic value when interest rates change. The examiner's assessment of the investment portfolio's risk should be part of an overall assessment of asset/liability management activities and interest rate risk.

3) Credit Risk

FHLBanks face credit risk in their investment activities from a variety of sources. These include:

- 1) Issuer credit risk** - the risk that the issuer or guarantor of a security or money market obligation will fail to pay as agreed;
- 2) Dealer credit risk** - the risk that the dealer from whom the FHLBank has purchased, or to whom it has sold, securities will default prior to settlement date; and

- 3) Custodian credit risk - the risk that the FHLBank's securities custodian fails and the FHLBank cannot recover all of its assets the custodian held for safekeeping.

Issuer Credit Risk

FHLBank investment portfolios traditionally have little credit exposure. FHLBanks generally have large holdings of Treasury and Agency securities, which are high credit quality assets. FHLBank management and examiners can assess portfolio quality by reviewing the percentage of the portfolio in each rating category. The three major rating services are Moody's Investors Service (Moody's), Standard & Poor's (S&P), and Fitch Ratings (Fitch). These services use the following standard bond rating symbols for investment grade obligations:

Summary of Investment Grade Rating Systems

Moody's	S&P	Fitch	Description
Aaa	AAA	AAA	"Gilt-edged;" extremely strong. Highest quality.
Aa	AA	AA	Very strong; high quality by all standards.
A	A	A	Upper medium grade; strong capacity to meet commitments; high credit quality.
Baa Lowest FHLBank-eligible grade is Baa3	BBB Lowest FHLBank-eligible grade is BBB-	BBB Lowest FHLBank-eligible grade is BBB-	Medium grade; adequate capacity to meet commitments; good credit quality.
Uses 1, 2, and 3 to show in-grade relative ranking	Uses +/- to show in-grade relative ranking	Uses +/- to show in-grade relative ranking	

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Summary of Non-Investment Grade Rating Systems

Moody's	S&P	Fitch	Description
Ba	BB	BB	Speculative elements; faces major uncertainties, but deemed likely to meet payments when due.
B	B	B	Generally lack characteristics of a desirable investment. Highly speculative; currently has ability to meet commitments, but faces major uncertainties which could lead to inadequate capacity to meet its commitments.
Caa	CCC	CCC	Poor standing; may be in default

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CCC	CCC	CCC	(Moody's); currently vulnerable to non-payment; high default risk.
	D	DDD DD D	In default; Fitch ratings reflect recovery prospects.

Although FHLBanks can use published securities ratings to help make investment decisions, they should also consider other sources of financial information. Exclusive reliance on ratings can be an unsafe and unsound banking practice because credit ratings may lag actual changes in credit quality. There have been a number of instances where companies maintained investment grade ratings until just before they defaulted.

To manage investment risks prudently, FHLBanks should supplement external ratings with internal credit analysis. The depth of the FHLBank's internal analysis should be a function of the security's rating, the complexity of the structure, and the size of the investment. The more complex a security's structure is, the more credit-related due diligence an FHLBank should do, even when the credit ratings are very high.

For example, there is a fundamental difference between a bond with a strong credit rating because of a third party credit enhancement and a bond with a strong rating because of structural subordination. A third-party credit enhancer, such as a guarantor or surety provider, may refuse to honor its obligation if the issuer defaults. FHLBanks should therefore carefully evaluate the third-party credit provider, and assess the entity's ability to honor its guarantee/surety bond obligation.

Subordination, on the other hand, builds the credit enhancement into the security structure. Other investors provide the credit enhancement by having a lower claim on the security's cash flows. For example, a \$100 security may have an \$85 senior tranche, a \$12 mezzanine (second loss) tranche and a \$3 "equity" (first loss) tranche. The senior tranche may carry an "Aaa/AAA" rating because of the enhancement provided by the two other tranches. In this type of structure, the senior tranche would suffer a loss only after the other two tranches have suffered complete losses. The mezzanine tranche would suffer losses only after the equity tranche has suffered a complete loss.

Investors do not universally prefer third-party credit enhancement or structural subordination over the other. Structural subordination, however, has become more common over time. In 2007, the declining number of firms rated Aaa/AAA as well as investors' desire to avoid undue concentrations in any

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single third-party credit enhancer.

The proliferation of asset-backed securities in recent years has given investors a wide range of choices among collateral types and security structures. Investors should understand why they are receiving a higher yield for the same credit rating.

FHLBank management should become familiar with the evaluation criteria used by the rating agencies for the type of security under consideration. Moreover, FHLBanks should ensure that they understand the scope of a credit rating. For most securities, the assigned credit rating applies to both principal and interest. However, underwriters can structure securities with a highly rated principal component, but with no rating for the interest component. Such securities may offer very high yields because of the uncertainty of collecting interest payments. The inconsistency of the high yields with the principal's rating should serve as a "red flag" for investors.

Because ratings are a convenient means of assessing portfolio credit quality, management should ensure that the ratings are current by periodically reviewing individual security ratings and updating them when necessary.

Money Market Asset Counterparties

FHLBanks routinely lend funds to counterparties in money market asset transactions, such as selling Federal funds, investing in certificates of deposit, time deposits, bankers' acceptances, and commercial paper. Money market assets enhance an FHLBank's overall liquidity posture, because their short maturities provide regular cash flow. This cash flow, which is a cushion against adverse funding conditions, can also fund advances or additional securities purchases.

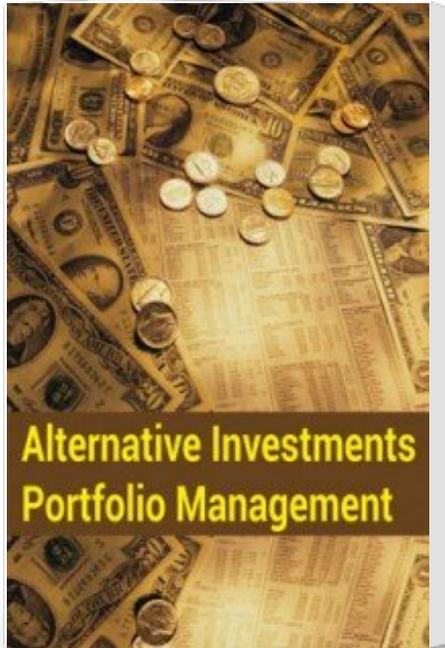
To control the credit risk posed by money market assets, FHLBanks should establish credit lines. The credit relationships should always involve internal financial analysis, with the depth and frequency of the analysis dictated by the size of the exposures. The use of external ratings can be a meaningful part of the analysis; however the FHLBanks should not rely exclusively on these ratings. Credit managers will often lower the line amount as the tenor of the exposure increases, because the longer the FHLBank agrees to be exposed, the greater the credit uncertainty. For example, an FHLBank may have a \$5 million overnight facility to a counterparty, but its 6-month line to that counterparty may only be \$3 million. The credit facility should cover aggregate credit exposures to a given counterparty, and thus include exposure from investments and from derivative contracts.

The following table highlights the short-term ratings scale used by the rating agencies:

Moody's	S&P	Fitch	Interpretation
A-1	P-1	F-1	Superior ability to repay
A-2	P-2	F-2	Strong ability to repay
A-3	P-3	F-3	Acceptable ability to repay
Not prime	B	B	Speculative
	C	C	High default risk
	D	D	Default

The rating agencies do not assign short-term ratings using the same methodology as for longterm

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