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What is a financial derivative?

A financial derivative is a financial contract whose value depends on the value of one or more underlying assets, indices, or reference rates. In other words, the fair market value of the financial contract will generally be derived from changes in the values of an underlying asset or index referenced by that contract. For example, the value of a U.S. Treasury bond futures contract will be determined by the price movements of actual Treasury bonds.

How do the FHLBanks use derivatives?

An FHLBank enters into derivatives to manage interest-rate risk, prepayment risk, and other exposure inherent in otherwise unhedged assets and funding positions. Derivatives are also used to manage the effective maturity, repricing frequency, or option characteristics of financial instruments to achieve risk-management objectives.

The FHLBanks are exposed to interest-rate risk primarily from the effect of interest rate changes on their interest-earning assets and their interest-bearing liabilities that finance these assets. The goal of each FHLBank's interest-rate risk management strategy is not to eliminate interest-rate risk, but to manage it within appropriate limits. To mitigate the risk of loss, each FHLBank has established policies and procedures, which include guidelines on the amount of exposure to interest rate changes it is willing to accept. In addition, each FHLBank monitors the risk to its interest income, net interest margin, and average maturity of interest-earning assets and interest-bearing liabilities.

Consistent with FHFA regulation, an FHLBank enters into derivatives: (1) to manage the interest-rate risk exposures inherent in its otherwise unhedged assets and funding positions, (2) to achieve the FHLBank's risk management objectives, and (3) to act as an intermediary between its members and counterparties. FHFA regulation and each FHLBank's risk management policy prohibit trading in, or the speculative use of, these derivative instruments and limit credit risk arising from these instruments. The use of derivatives is an integral part of each FHLBank's financial and risk management strategy.

The most common ways in which an FHLBank uses derivatives are to:
- reduce the interest-rate sensitivity and repricing gaps of assets and liabilities;
- preserve a favorable interest-rate spread between the yield of an asset (e.g., an advance) and the cost of the related liability (e.g., the consolidated obligation used to fund the advance);
- mitigate the adverse earnings effects of the shortening or extension of certain assets (e.g., advances or mortgage assets) and liabilities;
- manage embedded options in assets and liabilities;
- reduce funding costs by combining a derivative with a consolidated obligation because the cost of a combined funding structure can be lower than the cost of a comparable consolidated obligation; and
- protect the value of existing asset or liability positions or of anticipated transactions.

Do the FHLBanks all use the same pricing models and assumptions in measuring interest rate risk?

Each FHLBank is a separately chartered cooperative with its own board of directors and management and is responsible for establishing its own accounting and financial reporting policies in accordance with accounting principles generally accepted in the United States of America (GAAP). Although the FHLBanks work together in

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an effort to achieve consistency on significant accounting policies, the FHLBanks' accounting and financial reporting policies and practices are not necessarily identical because alternative policies and presentations are permitted under GAAP in certain circumstances.

Each FHLBank bases the fair values of derivatives with similar terms on market prices, when available. However, active markets do not exist for many of the FHLBanks' derivatives. Consequently, fair values for these instruments are generally estimated using standard valuation techniques such as discounted cash flow analysis and comparisons to similar instruments. In limited instances, fair value estimates for derivatives are obtained from dealers and are corroborated by an FHLBank using a pricing model and observable market data. In addition, the results of the models are subject to PricewaterhouseCoopers' audit procedures as part of their annual audit of each FHLBank.

Each FHLBank's board of directors must adopt policies to manage the FHLBank's exposure to credit, liquidity, and interest-rate risk. In addition, each board of directors is responsible for monitoring that FHLBank's compliance with FHFA regulations.

What is the FHLBanks exposure to credit risk from derivatives transactions?

Each FHLBank transacts most of its derivatives with large banks and major broker-dealers. Some of these banks and broker-dealers, or their affiliates, buy, sell, and distribute consolidated obligations. Derivative transactions may be either executed with a counterparty (uncleared derivatives) or cleared through a Futures Commission Merchant (i.e., clearing agent) with a Derivative Clearing Organization (cleared derivatives).

Each FHLBank is subject to credit risk due to the risk of non-performance by counterparties to its derivative transactions, and manages credit risk through credit analysis, collateral requirements, and adherence to the requirements set forth in its policies, U.S. Commodity Futures Trading Commission regulations, and FHFA regulations.

The contractual or notional amount of derivative transactions reflects the involvement of an FHLBank in the various classes of financial instruments. The maximum credit risk of an FHLBank with respect to derivative transactions is the estimated cost of replacing the derivative transactions if there is a default, minus the value of any related collateral, including initial and certain variation margin. In determining maximum credit risk, each FHLBank considers accrued interest receivables and payables, as well as the netting requirements to net assets and liabilities.

Uncleared Derivatives. For uncleared derivatives, the degree of credit risk depends on the extent to which master netting arrangements are included in these contracts to mitigate the risk. Each FHLBank requires collateral agreements with collateral delivery thresholds on the majority of its uncleared derivatives. Additionally, collateral related to derivatives with member institutions includes collateral assigned to an FHLBank, as evidenced by a written security agreement and held by the member institution for the benefit of that FHLBank.

Cleared Derivatives. For cleared derivatives, a Derivative Clearing Organization (Clearinghouse) is an FHLBank's counterparty. The Clearinghouse notifies the clearing agent of the required initial and variation margin and the clearing agent in turn notifies the FHLBank. Each FHLBank utilizes one or two Clearinghouses for all cleared derivative transactions, LCH.Clearnet LLC and/or CME Clearing. Effective January 3, 2017, CME Clearing made certain amendments to its rulebook, changing the legal characterization of variation margin payments to be daily

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settlement payments, rather than collateral. Variation margin related to LCH.Clearnet LLC contracts continues to be presented as cash collateral. At both Clearinghouses, initial margin continues to be considered cash collateral. The requirement that an FHLBank post initial and variation margin, through the clearing agent to the Clearinghouse, exposes an FHLBank to credit risk if the clearing agent or the Clearinghouse fails to meet its obligations. The use of cleared derivatives is intended to mitigate credit risk exposure because a central counterparty is substituted for individual counterparties and collateral/payments for changes in the fair value of cleared derivatives is posted daily through a clearing agent.

How do the FHLBanks account for their derivatives?

All derivatives are recognized on the balance sheet at their fair values and are reported as either derivative assets or derivative liabilities, net of cash collateral, accrued interest from counterparties, and variation margin for daily settled contracts. An FHLBank presents derivative instruments, related cash collateral, including initial and certain variation margin, received or pledged and associated accrued interest, on a net basis by clearing agent and/or by counterparty when it has met the netting requirements. If these netted amounts are positive, they are classified as an asset and, if negative, they are classified as a liability.

If hedging relationships meet certain criteria, including, but not limited to, formal documentation of the hedging relationship and an expectation to be highly effective, they qualify for fair value or cash flow hedge accounting and the offsetting changes in fair value of the hedged items may be recorded either in earnings (fair value hedges) or accumulated other comprehensive income (cash flow hedges). For both fair value and cash flow hedges, any hedge ineffectiveness (which represents the amount by which the change in the fair value of the derivative differs from the change in the fair value of the hedged item or the variability in the cash flows of the forecasted transaction) is recorded in current period earnings. The accounting used by the FHLBanks for typical hedge transactions is summarized as follows:

Hedge Type	Hedged Item	Accounting Recognition
Fair-Value	Recognized asset or liability or unrecognized firm commitment	Change in fair values of the derivative and hedged item (related to the risk being hedged) are recognized in current period earnings
Cash-Flow	Forecasted transaction or variable cash flows with a recognized asset or liability	Changes in the fair value of the effective portion are recorded in accumulated other comprehensive income (a component of capital) until earnings are affected by cash flow variability (any ineffectiveness is recognized in current period earnings.)
Non-Qualifying Hedge (Economic Hedge)	Does not meet hedge criteria; used for asset-liability management purposes	Fair value of derivative is recognized in current period earnings
Non-Qualifying Hedge (Intermediation Hedge)	Does not meet hedge criteria; used to offset other derivatives with members and non-member counterparties	Fair value of derivative is recognized in current period earnings

How do the accounting guidelines for derivatives affect the financial statements of the FHLBanks?

Under GAAP, an FHLBank is required to recognize certain unrealized losses or gains on derivative positions whether or not the offsetting gains or losses on the related hedged items (i.e., the underlying assets or liabilities being hedged) are recognized in a symmetrical manner. For instance, an economic hedge by definition introduces the potential for earnings variability caused by the changes in fair value of the derivatives that are recorded in an FHLBank's income but that are not offset by corresponding changes in the value of the economically hedged assets, liabilities, or firm commitments. As a result, an FHLBank recognizes only the net interest and the change

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in fair value of these derivatives in current period earnings, with no offsetting fair value adjustments for the assets, liabilities, or firm commitments. As a result, when interest rates change significantly, an FHLBank's reported GAAP earnings may exhibit considerable variability.

Certain FHLBanks have each elected the fair value option for certain financial assets, financial liabilities and commitments that either do not qualify for hedge accounting or may be at risk for not meeting hedge effectiveness requirements. These fair value elections were made primarily in an effort to mitigate the potential income statement volatility that can arise from economic hedging relationships in which the carrying value of the hedged item is not adjusted for changes in fair value.

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